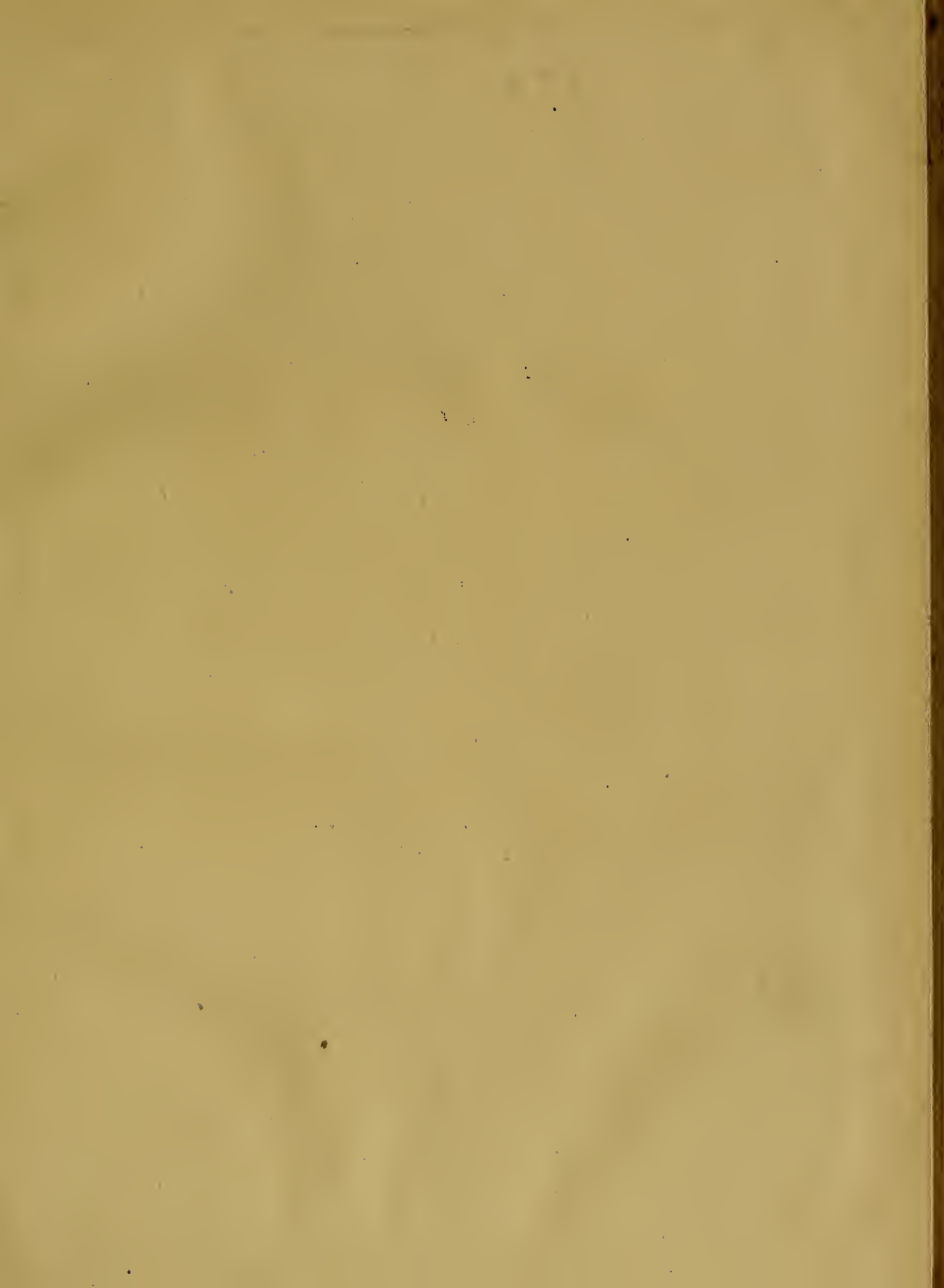


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No. 823. Vol. 22.

Thursday, January 2nd, 1919.

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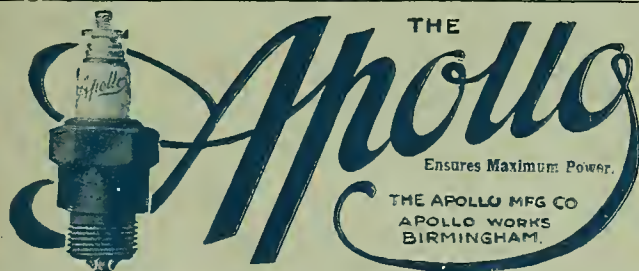
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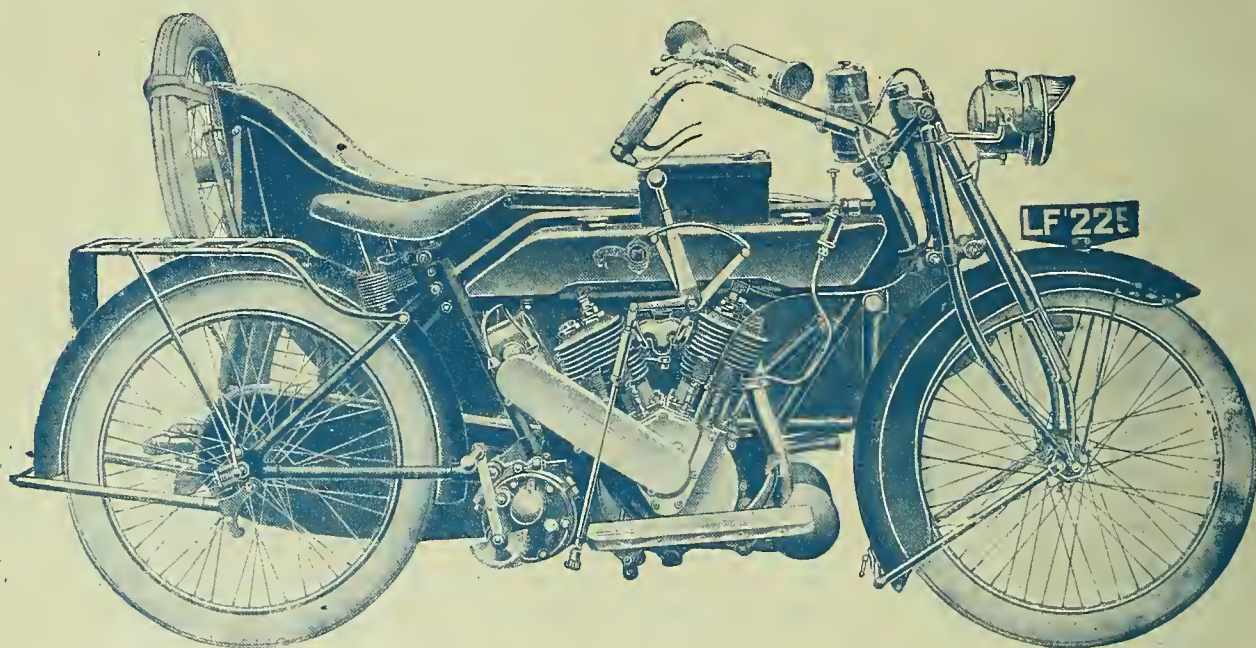
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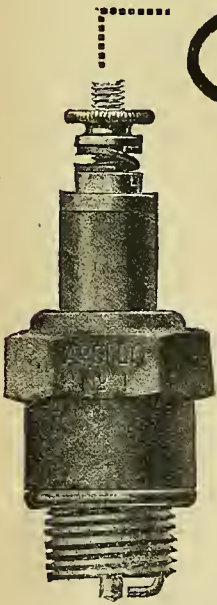
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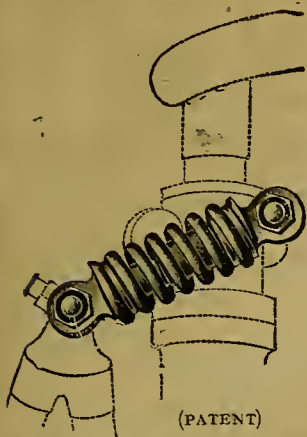
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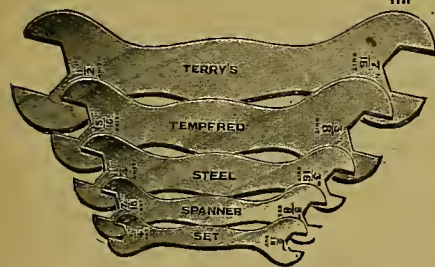
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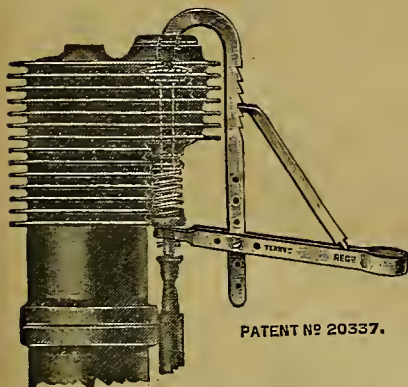
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Replaces fixed link. Absorbs bar vibration. Gives motor cycling a luxury it never had before. Ask for Leaflet "Tests and Trials," and form for measurements.

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687.—Best quality hardened and tempered **KICK-UP STAND CLIP.**
2/- each.

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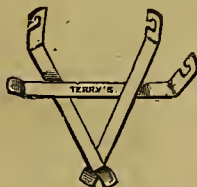
Hook ends are pressed from solid STEEL, centre piece has no joints. Has immense strength, and ease of detachability. For all belts. With extra link, 1/- each.

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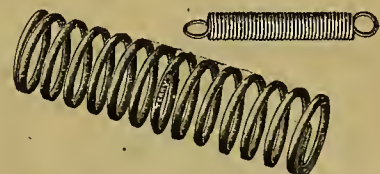
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Useful for fixing to exhaust pipe to hold plug for testing spark

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TERRY'S HIGH-GRADE SPRINGS for all purposes render satisfactory service, and for Valve Springs our "Ex" quality is recommended.

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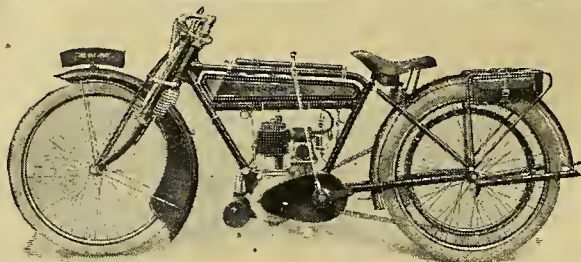
Forty fine wires in coiled spring case 4d. each.

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THE RELIABLE MACHINES.



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has made its name
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reputation is unequalled. To-day it is adding to
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it will be an even better cycle for this experience.
Do not forget us—that you should not—
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Manufacturer

49 Lichfield Rd.
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till Trouble Troubles you

— BUT —

when Trouble does
Trouble you, turn to

TRACING TROUBLES

MOTOR CYCLE FAULTS, THEIR IDENTIFICATION AND
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In this edition considerable changes
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has been taken out and new material
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The section which deals with the
two-stroke type of motor cycle has
been enlarged and re-arranged in
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lighting dynamos as applied to motor
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The Book that helps Motor Cyclists out of their Troubles.

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¶ Not only does it show how to
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CORD TYRES

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No need to dodge grease patches or "pot-holes" on Palmers—they are the safest tyres on the road.

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MECHANICAL LUBRICATION with LARGE SUMP TO COOL THE OIL.

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Infinitely Variable Gear with Free Engine.

AUTOMATIC BELT TIGHTENING DEVICE (About 2in. of Belt Adjustment without use of tools).

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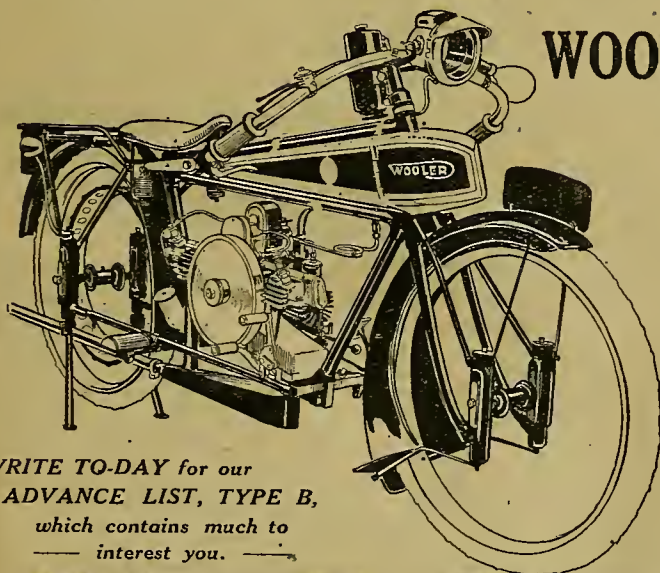
DETACHABLE SPARE PETROL TANK

STRONG ALL STRAIGHT TUBE FRAME

DETACHABLE WHEELS, and above all

GREAT ACCESSIBILITY

MANY FEATURES on our New Model are UNIQUE TO THE WOOLER, and we can justly claim to be the PIONEERS in the introduction of other Features now universally recognised as "GOOD PRACTICE," but this topic and other interesting things will be dealt with in future issues.



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ESTABLISHED 1865.

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£10 will be paid for information which may lead to the recovery of a "Royal Enfield" 6 h.p. Combination. Registration No. MX 6631, Engine No. W 5071. Special screen and hood, Watford speedometer No. 705, 1915 make. Also the same amount will be paid for similar information leading to the recovery of a 1914/15 3½ h.p. Twin "Zenith" Engine No. 52830, mag. chain case slightly damaged. "Matchless" 8B Model, Engine No. 34572, Frame No. 3041, Regd. No. LR 3766 undertank tube cracked at head.

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Mechanically
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There's still space for it—still room for those who don't intend to wait *indefinitely* for their post-war N.U.T.

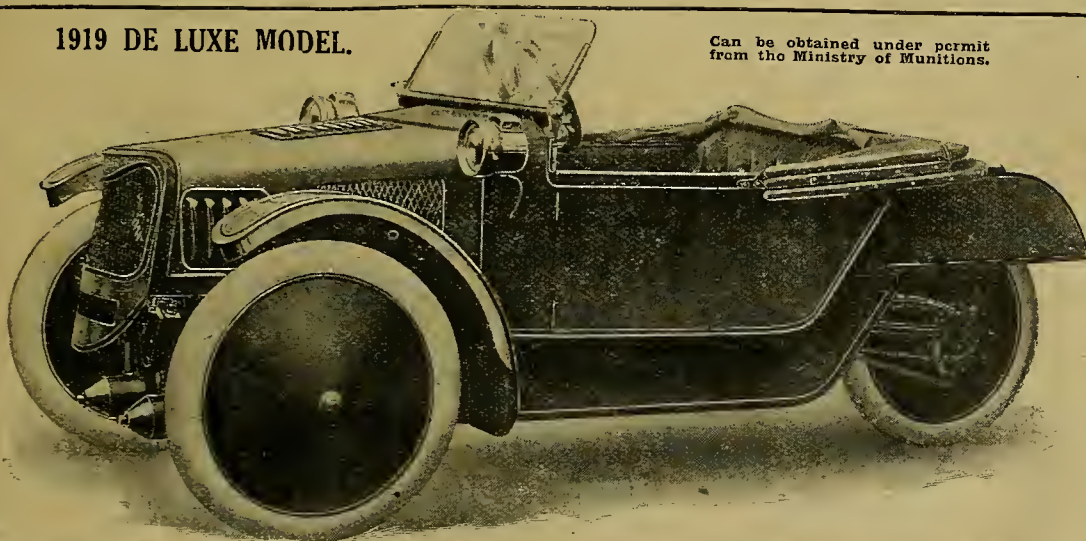
There'll be a *limit* to our output—as large as it will be—and as our policy provides for the *rotational* execution of our orders, the only *safe* course to adopt is to put your name upon our waiting list to-day.

The Newcastle-upon-Tyne Motor Co., Ltd.,
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N.U.T.

1919 DE LUXE MODEL.

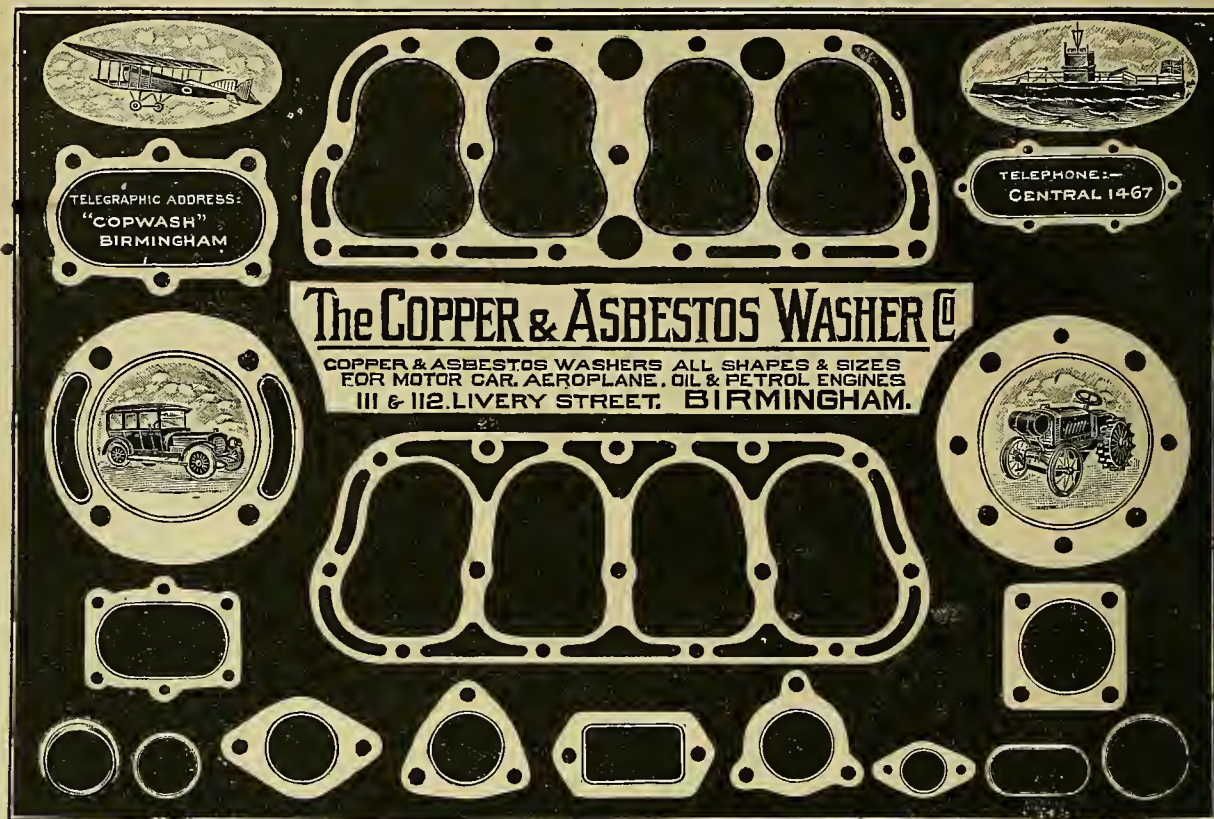
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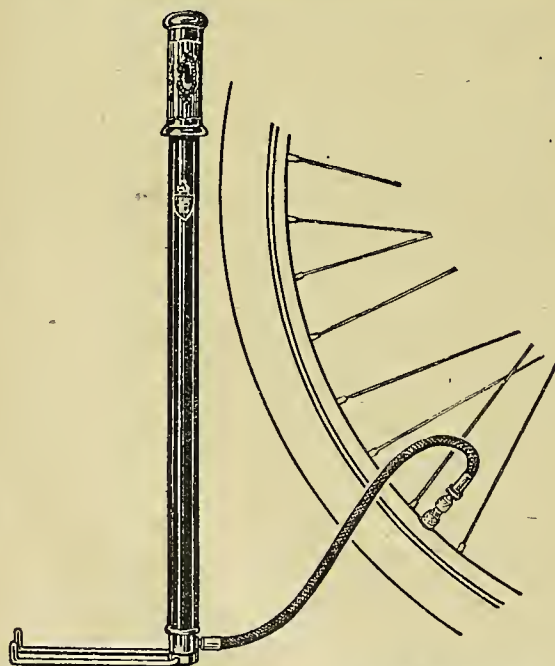


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111 & 112, LIVERY STREET, BIRMINGHAM.



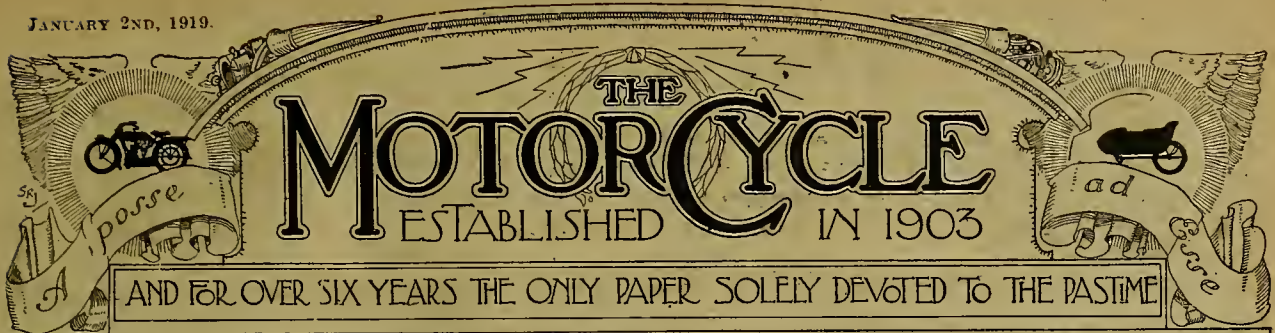
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Reconstruction and Overseas Trade.

THE whole of this issue is the expression of our faith in the future of the motor cycle, and not our faith alone, but that of the trade and the riding public. Let it not be imagined, however, that a successful future can lie before the most sporting of all mechanically propelled vehicles without great and very special effort on the part of all concerned.

In the past it was, we fear, the habit of many manufacturers to look upon the British Isles only as their market, and to regard our Overseas Dominions and foreign countries simply in the light of places where some of their surplus stock might find purchasers. This attitude will not make for success in the future. The manufacturer should regard the whole world as his market, but chiefly, of course, should he look to the British Empire, by which we mean the Empire as a whole—i.e., the federation of free states which make up the British Dominions. Now we are convinced that a really successful foreign trade cannot be built up by the methods which have hitherto been employed. Special machines must be designed which are really suitable for the conditions obtaining in the newer and less fully developed countries. In designing these machines the opinions of residents in the outlying parts of the world should be consulted far more than has hitherto been the case. The British motor cycle is a very fine mount, entirely suitable for use in this and many other countries, but when the needs of those who live at "the back of beyond," as it were, come to be considered, it will be found that the British machine—excellent as it is for those purposes for which it was designed—will fall short of perfection, even when provided with heavier rims and spokes, larger tyres, and slightly more ground clearance, which items represent the usual alterations in the standard machine to convert it into an Overseas model. This should be designed from beginning to end with the

object of making it capable of overcoming the obstacles that it will have to face, and of satisfying the requirements of those who will ride it.

These remarks must suffice for the present regarding the machines themselves, but a few words respecting the selling methods will not be out of place. These, in our opinion, at once require very thorough revision. During the war the American manufacturers made very great headway not only in foreign countries but in our own Colonies. This was, of course, only to be expected in view of the abnormal conditions which prevailed, and the fact that America did not come into the war for so long a time after the commencement of hostilities. The British manufacturer, therefore, has much ground to recover, and we fear that he will never recover it till he has improved his methods out of all recognition. Let him study the American methods and improve upon them. At present the American is able to offer to British colonists better terms, better service in the vital matter of spares, and a machine which in many respects is more suited to his requirements than the British article; and so long as this is so the British manufacturer will have to take second place. Let him not despair, however, but set to work on the right lines either by forming depots in every dominion for the proper distribution of his machines and spares, or by appointing suitable agents and equipping them in such a way that they may be able to supply sub-agents in the different districts with adequate stocks. Prices, too, must be settled on equitable lines, and not left to the caprice of the smaller dealers. There are hundreds, nay thousands, of men in our Overseas Dominions who from a patriotic feeling alone would buy the British article in preference to any other, provided that they were assured the maker would continue to take a real interest in their machines, and that they could purchase spares without having to send to England and waiting many months for their delivery.



THE MAKERS' VIEWS.

Comments on the Opinions which appear in this Issue.



THE problems before manufacturers during the "reconstruction" period are many; that they are fully appreciated by most of the makers of motor cycles is revealed in their contributions appearing in this issue. The altered conditions pertaining to the cost of labour undoubtedly will be one of the most important factors which the industry will have to face, and although all of our captains of industry do not refer to this, we have evidence that all are thinking about it.

Prices and Tariffs.

Mr. W. Douglas goes into figures, both in connection with labour and material. Wages, he writes, are 100% to 300% higher than in 1914, and with material increased in price 100% to 600%. He points out that the improved shop methods cannot be expected to counterbalance the increases.

Mr. J. W. Stocks, of Ariel Motors, Ltd., also touches upon this subject, but he thinks that foreign competition may "straighten out matters." Mr. Stocks also favours a reciprocal tariff, a view shared with Mr. Harold Bowden, of the Raleigh Co., who suggests an import duty of at least 33% in order to protect the British motor cycle industry during the period of reconstruction. Mr. Humphries, of the O.K. firm, states that this protection should be in exactly the same ratio as the American tariff wall against ourselves.

Mr. Frank E. Baker, of Precision engine fame, gives a commonsense view of the Ford motor cycle proposition, and as this gentleman has had American experience, and is in close touch with American methods, his short contribution is of more than ordinary interest. Mr. Baker also pays tribute to the work of *The Motor Cycle* in the pioneer days and during the war.

Several of our contributors have dealt with the post-war motor cycle. Mr. Hyde, of the B.S.A., thinks that the single will retain its popularity, if only on account of its good work in the war, but he appreciates that there will be a brisk demand for a 6 h.p. V twin for sidecar work. Mr. R. W. Smith, the Enfield managing director, thinks that the best way to meet demand during the immediate reconstruction period will be to reintroduce existing models so that there will

be the least delay in delivery. Mr. J. W. Stocks shares this view, as does Mr. Norman T. Downes, of the New Imperial Co., but Mr. W. H. Carson (Excelsior Motor Co., Ltd.) thinks that very few makers will be satisfied to recommence where they left off in 1914.

In the future, concentration upon few models is likely to be the rule instead of the exception. Mr. Geo. Stevens, of the A.J.S. firm, mentions the necessity of concentration on one model and of quantity production, and for a more scientific knowledge of metals, while Mr. Rigby (Royal Ruby) and Mr. N. Downes refer to concentration.

Mr. Morgan writes of cycle cars and mentions that in all probability the demand in 1919 will exceed the supply, while Mr. Butterfield appears to think the word "reconstruction," in connection with motor cycles, conveys an impression that the industry has been reduced to a state far worse than is really the case.

Mr. C. A. Hyde, President of the Cycle and Motor Cycle Manufacturers' and Traders' Union, refers at length to the disposal of war-worn motor cycles supplied to the Allied Governments. Mr. Hyde deals with the question from both makers' and riders' points of view.

Mr. H. A. Collier makes a plea for greater intercourse and co-operation within the industry to meet international competition in Overseas markets, while Mr. P. F. Bennett, chairman of the British Ignition Apparatus Association, gives some

particulars concerning Great Britain's latest industry in which the value of such co-operation is made manifest.

The Benefit to the Rider.

Mr. Hulbert, of the Triumph Co., still pins his faith to the reliable single-cylinder machine, and is reminiscent concerning the days of long ago, while Mr. W. J. Lloyd (L.M.C.) makes an interesting announcement anent his post-war spring frame design.

Altogether, from the views expressed, we think that readers of *The Motor Cycle* will appreciate that the captains of the industry are fully alive to the possibilities of the future, and that the experience gained in the making of munitions will eventually benefit the riding public.

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LIXION

Easy Starting.

IN pre-war days the motor bicycle did not enjoy too good a reputation for easy starting, so far as the general public were concerned. Our good starts attracted no attention, but a rider who spent ten minutes on pedalling kicks, with an accompaniment of oaths and backfires, set people thinking and talking. Still there was a substratum of fact in the popular impression that starting was anxious work. New machines almost invariably started with consummate ease. But the induction system was not always airtight after an overhaul. The somewhat crude lubrications fitted to many mounts tempted anxious owners to soil their plugs. The magneto often lost its youthful zip after a few months: one of our staff used to own a machine which would not start on the handle unless its contact breaker points were washed over with petrol, and most contact breaker arms grew sluggish in wet weather. In other words, the machine sooner or later degenerated into an uncertain starter unless its owner was a bit of a mechanic.

Starting the 1920 'Bus.

NOTHING creates a worse impression on the nibbling purchaser or on an observant public than the spectacle of an ignorant and perspiring individual foaming oaths over a quiescent motor cycle. If our fears about the quality of post-war spirit materialise, heavy fuel is going to import a fresh difficulty. It is therefore up to the trade to eliminate every possible difficulty; and all the troubles indicated in the previous paragraph can be cured by sound design. It is bad design to supply an induction pipe which can only be reassembled in airtight condition by using fat bandages of insulating tape. It is bad design to supply an engine which can be grossly over-oiled by anybody but a fool, and worse design which causes an engine to "cluck" like a cheap jelly if a stupid owner injects a gill too much oil. Long plain bearings, tight-fitting pistons with four rings, and fly-wheels with invisible crank case clearance are so many requests for starting troubles. A magneto contact breaker should be proof against over lubrication, and should have a rocker arm which cannot stick. These elementary reforms are a prefacé to the main question, which is how to force heavy petrol to furnish a good starting mixture on a cold day. This latter problem may ultimately be solved in one of three ways:

- (a.) An unexpected supply of more volatile fuel.
- (b.) Application of heat to the carburetter.
- (c.) Mechanical atomisation of the starting charge, e.g., by a "dope spray."

Until the air leak, over-oiling, and "dud mag." factors are cleared out of the way, inexperienced riders will put all the blame on petrol; and we may get

saddled with tiresome gadgets, such as electric carburetter heaters, the necessity for which remains to be proved.

Life's Little Worries.

I AM just readying my pre-war 'bus for its first post-war jaunt, and it teaches me how patient I used to be. In the preliminary inspection I struck many irritating little jobs, all of which could have been avoided by a little care on the part of the designers concerned. The inflator connection was so tight a fit in the tyre pump handle that I had to use pliers to get it out. The tool roll needed a great deal of coaxing to fit one of the pannier tool bags, and the big wrench had to go in the opposite bag. The tyre repair outfit had to go in my pocket, as it was too wide for the pannier. If I took a smaller size of tyre outfit, it would go into the pannier, but banished the big spanner. No sane provision of any kind had been made for the small oddments, such as chain links. The only possible procedure was to mass the tyre kit, spare plugs, and valves at one end of a pannier, wrap all small oddments in rag, and wedge the whole caboodle together with more rag. Next the tyre wanted a few pounds of pressure, and the valve was so wedged in by wheel spokes and belt rim spokes that it reminded me of the old shorthorn Farman aeroplane: this 'bus is said to be properly rigged when a canary cannot get out of it! Then I tried to replenish the oil tank, and made a selection between three alternatives, viz.:

- (a.) To slop oil down the tank side.
- (b.) To remove the handle-bar.
- (c.) To remove the acetylene generator.

Finally, I took the backlash out of the throttle wire by extending the Bowden casing with a wrapping of thin wire, no adjuster being fitted: and adjusted the clutch by improvising some packing washers, as the solitary nut could not be locked, and its thread was apparently Esquimaux gas thread, or some other outlandish pitch.

Water-cooled Motor Bicycles.

ONE or two readers have asked me to put in a word for the water-cooled engine, chiefly on the ground that the extra cooling enables a more efficient engine to be adopted. From my own standpoint water-cooling has one advantage, and one only. It would enable the engine and subsidiary fittings to be so completely boxed in that the power unit could be washed down with a powerful hose. Apart from ease of cleaning, I have no wish to see a water-cooled motor cycle. The Scott does not go half as far in the direction of a streamlined case as is possible: but it certainly adds to many other merits the distinction of being the easiest machine on the road to clean.

OPINIONS

Notes on
The Past,
The Present;
and
The Future.
By Prominent
Men in the
Motor Cycle
Movement.



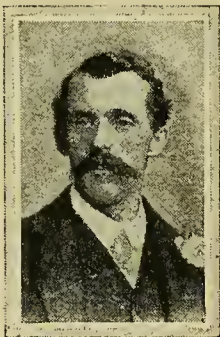
First Series:
Comments of the
Captains of the
Motor Cycle
Industry.
Next week
Further
Opinions will
be given.

From Mr. C. A. Hyde, of the B.S.A. Co.,
President of the Cycle and Motor
Cycle Manufacturers' and Traders'
Union.

It is difficult at this stage to forecast with any accuracy what trend the post-war demand for motor bicycles will take, but judging from Government specifications during the war, and reports from the various Fronts, the single-cylinder type has found added favour as a "no trouble" mount—easy to tune up, to adjust, and to drive, almost immune from minor ailments, and with plenty of power for all general purposes.

This favourable bias on the part of military motor cyclists cannot fail to have its effect on the post-war demand.

At the same time, however, it is anticipated that there will be a brisk demand among those desiring a higher powered mount—for a V type twin-cylinder machine of, say, about 6 h.p.—and a good deal of experimenting is going on among manufacturers with a view to perfecting this class of motor cycle.



Mr. C. A. Hyde.

An important question that must seriously be faced by those manufacturers who have supplied motor cycles to the British and Allied Governments is that of the disposal of surplus machines and spares no longer required by the authorities. To dump large numbers of such machines on the market and sell indiscriminately by auction would, probably, not only seriously affect the commercial and manufacturing arrangements of the manufacturers—which would ultimately be to the prejudice of the whole industry and sport—but private purchasers of discarded machines would, naturally, in nearly every case, run very considerable risks of finding themselves with defective mounts (for of course no warranty

would be given). At the same time, the original manufacturers would very probably be—obviously quite unfairly—blamed for defects developed as a result of abnormal stresses or careless handling at the Front, for which they would actually themselves be in no way responsible.

It has therefore been suggested that the Ministry be approached with a view to arrangements being made for all surplus motor cycles to be sold back to their respective manufacturers at an agreed price, the manufacturers then thoroughly to overhaul them, make good everything necessary, and sell to the motor cycling public as renovated machines.

Everything points to a large increase in the number of those interested in motor cycling, and manufacturers as a whole will have well learned the lessons of the war in regard to quantity production. It is doubtful, however, if any appreciable fall in prices can be expected for some time to come, since production costs will continue to rule very heavily, due to increased price of raw materials and the fact that, while wages are higher than ever they were before the war—and are likely to remain high—hours of labour are to be fewer.

From H. A. Collier (H. Collier and Sons, Ltd., Makers of the Matchless Motor Cycle).

ONE of the greatest lessons of the war has been the value of co-operation.

In the automobile industry the conditions prevailing during the war have resulted in intercourse between staffs of firms hitherto regarded as rivals, which would have been impossible under normal conditions. If this intercourse and co-operation within the industry can become permanent, it can only have a beneficial influence to the interests of manufacturers and consumers alike. It would also greatly help the industry to meet international competition in Overseas markets; this tends towards the lowering of prices, which only a large market can assure.

As in the industry, so in the pastime, should all co-operate for the advancement of the movement, and I look upon it as the duty of every motor cyclist to join

the A.C.U., and so give that body added power to promote the interests of motor cyclists.

Personally, I am looking forward to the resumption of motor cycling and the meeting of old friends with the liveliest anticipations, and shall appreciate its pleasures all the more for the forced abandonment of them during the last four years.

From Mr. Frank E. Baker, of Precision Engine Fame.

REPLYING to the Editor's enquiry as to my views on machines, methods, and general problems as they affect the motor cycling world during the reconstruction period, I would submit that in a general way these questions can be answered by the word "faith."

There was a period in the history of the motor cycling movement and trade when this attitude was even more difficult than at present. I think it would be about 1904 and 1905 when most people had given up the struggle of producing a commercial machine. It will always redound to the credit of the proprietors of *The Motor Cycle*, the Triumph Co., and of my friend Mr. Prestwich, that they held on to their belief in the ultimate success of the motor cycle.

I am looking forward to a revival of this faith in the motor bicycle, by which I mean a solo machine which affords its owner the speed and distance capacity of the automobile with the handiness, individuality, and sporting character of the bicycle. Many machines met these requirements even before the war, and their utility has been further demonstrated by our despatch riders with the various armies.



Mr. Frank E. Baker.

Opinions.—

I do not at this juncture attach any importance or magic to the word "standardisation." The motor bicycle is not yet a stereotyped production.

I hope to see a change of view on the part of the politicians and publicists generally in regard to the belief that businesses can only be economically conducted by large units of production.

The progress of the motor cycle, as of other branches of the engineering trade, is largely due to the initiative of pioneers and small concerns.

The standard motor bicycle will materialise, as in the case of the Ford car, when the genius of a particular designer, in conjunction with the necessary organising ability, provides the article.

In a communication of this kind, in which the writer is expressing his own views as to immediate possibilities, it is desirable that he should recognise that his own interests affect his outlook. I do not therefore propose to touch controversially on the merits of various types of engines.

I hope that I and my associates have contributed something that will help to broaden the use of the motor cycle and solve some of the problems of the past. Whether we are right or not can only be demonstrated by the "Man on the Road."

The future is full of hope, and competition will be keen and interesting. In the motor cycle trade, such competition, as in the past, will, I believe, be relieved of much of its dull and sordid side by the sporting spirit of the men engaged in the industry.

I take this opportunity of paying a personal tribute to the courage and enterprise that have characterised *The Motor Cycle*, to which both rider and manufacturer are incalculably indebted.

From Mr. Wm. Hughes Butterfield, A.M.I.A.E., of Butterfields, Ltd., Makers of the Levis Motor Cycle.

"RECONSTRUCTION."—It sounds rather like admitting that we were reduced to a state far worse than is really the case. There is no doubt that the past four years have shown us how necessary it is to "put our house in order," and I am of the opinion that the cessation of hostilities has found some of the motor cycle manufacturers in a state of unpreparedness.



Mr. Wm. Hughes Butterfield.

Let us appreciate the task we have before us, and let us appreciate the huge possibilities open to the motor cycle both at home and abroad.

Let us "open the throttle" and get "all out" on Production.

From Mr. W. Douglas, Head of the Firm of Douglas Motors, Ltd.

WE are mostly interested at the moment in the new industrial life and the industries generally, but particularly the motor cycle industry. The demand for motor cycles even at the present unsettled moment is enormous. What it will be when we have fully realised that victory is ours and the peace for which our fine fellows have bravely fought is an established fact, when the creation of a new working class is recognised, when the longer hours of recreation that this new life will give them are appreciated, when we are freed from the fetters of war-time legislation, what the demand will then be few of us realise. We, of Douglas Motors, are in the enviable position of having remained to a considerable extent at our normal trade, that of making motor cycles—motor cycles for the Allied armies of the world. Now we are prepared (subject to the consent of the Ministry of Munitions, which cannot be withheld very much longer under the existing circumstances) to devote our entire resources to the demands of our old clients and the riding public generally. For this we are very thankful; thankful for those who have fought our fight, and we hope that early in the New Year we may help them once more to enjoy the unparalleled pleasures of the highways of Blighty.

Much has been said during the past about the production of a low-priced motor cycle, and we fear many believed that with the advent of peace such a machine would be available.

Unfortunately many writers, whose sole experience of works costs and production consists of visions that pass in their slumbers, have created the impression that the manufacturing of a cheap motor cycle was not only a small problem, but one that many firms had solved, and that the long-looked-for present period would see the market flooded with such models. To-day we have peace with us, but what do we find? Prices greatly increasing and the entire absence of a cheap machine. With the present unsettled state of the material and labour markets this is only to be expected. High wages—100% to 300% increase over 1914—are the order of the day, and similarly materials have increased in price from 100% to 600%. Now, even with what we may have learned in shop methods during the war, the resultant higher production cannot counterbalance these increases. No concern could be more anxious than we are to give the public a cheaper machine, but no firm is more determined than we are to see that we only make an *honest machine*—a machine which, though perhaps slightly higher in price, is considerably better value than any model we have previously produced.



Mr. W. Douglas.

From Mr. E. H. Humphries, Director of Humphries and Dawes, Ltd., Makers of the O.K. Motor Cycles.

THE first and foremost feature that interests a British manufacturer to-day is what protection the British industry is going to receive at the hands of the Government.

Certain it is that, as in the instance of America, whose manufacturers have not broken down on the manufacture of their ordinary lines, and whose stocks, though low, must be considerable when taken into account with the amount of stock held by British manufacturers, protection must be afforded.

In my estimation, such protection should be in exactly the same ratio as the American tariff wall against ourselves.

The next problem is one of raw material. No indication has yet been given by the Government as to whether raw material is to be rationed or not, and since certain Government Departments are asking firms to take over surplus Government stocks, if of use to them, it does not look as though there will be a rationing scheme, but that those firms who have continued on work on motor cycles and cycles will have the advantage of whatever stocks they may be holding at the minute in their possession, although such material may be the property of the Government.

My idea of the utility motor cycle for the future will be a handy lightweight with a three-speed gear, kick starter, electrically equipped, and, provided engine ground clearance can be kept at 7in. or above, 26in. wheels will form a far more comfortable vehicle than one with 28in. wheels.

It is our intention to fit to our post-war lightweight 26in. x 3in. tyres, and undoubtedly spring frames will be a very attractive proposition.

It will be the policy of my house in future to make everything possible within its own four walls, and we are rapidly organising to this end.

From R. W. Smith, Managing Director of the Enfield Cycle Co., Ltd.

I THINK the immediate duty of the motor cycle manufacturers is to meet the existing great demand for motor cycles. For some little time output will be largely regulated by the raw material available; but, by proper utilisation of this, there should be reasonable supplies of motor cycles during the next few months.

The problem of reconstruction facing each manufacturer, or, in more homely phrase, the period of putting his house in order for private trade, is not an easy one. My opinion is that this will be best met by producing existing models for the immediate future so that there will be the least possible delay in delivery; and this is the policy the Enfield Co. will rigidly follow.

Even during the past few strenuous years we have not allowed our grip on the industry to be relaxed, and this will be recognised when we make public the result of our experiments and labour. The present time is not opportune; but I can at least say that what we shall have to offer the motor cycling world in the future will arouse the keenest interest, and that, I think, must suffice for the moment.

Opinions.—

From Mr. H. F. S. Morgan, the Designer of the Morgan Runabout.

I CANNOT pretend to deal with motor cycles, for I have always specialised in cycle cars. The cycle car is the necessary link between the cycle and the car. The light car does not fill the gap: it approaches too nearly to the car. The cycle car manufacturer must study the requirements of the motor cyclist even more closely than those of the car owner. It is true that some who in former days owned cars will find that a cycle car best suits the post-war condition of their pockets, but the majority of orders will come from those who have been (or were intending to become) motor cyclists, and who for some reason or another are not content with the motor cycle. I may add that the cycle car seems to make a strong appeal to the airman. Now the motor cyclist and the airman have been used to an essentially "sporting" type of machine. It is of no use to offer them a mount which will only amble along the road. There are any number of people who say (and write) that this is the sort of machine they want, but they are not the sort of people who buy.

Moreover, the motor cyclist takes some pride in the mechanical details of his "bus. He has been used to tinkering with it at home, and rather likes it—in moderation. But he has no use for a machine which demands incessant tinkering, nor certainly for one which needs expensive garage repairs.



Mr. H. F. S. Morgan.

The simple cycle car, which meets these requirements, will be in greater demand than ever after the war, now that so many have gained some mechanical knowledge. It will be impossible for the manufacturer to reach his limit of production for some time. He will not have the materials, and he will not have the men. An agent said to me the other day, "You will have no excuse now; you can get at once all the men that you require." This is not the fact, and we cannot wish that it should be so. If we could obtain at once all the men that we require, where would be the jobs for the men—some millions—who will return later from serving their country? We must "hasten slowly," and for some time the demand for cycle cars will exceed the supply. On the other hand, the demand will not be unlimited, and no machine has any chance of lasting success which has not special attractions of its own.

From Mr. Harold Bowden, Managing Director of the Raleigh Cycle Co., Ltd.

ONE of the most important things to consider from the British motor cycle manufacturers' point of view, I think, is the conserving of our home and colonial markets for the British motor cycle, which to-day is still superior to foreign productions.

The duty of at least 33½% should continue on all imported motor cycles and parts, otherwise the country will be swamped with the surplus outputs of foreign makes, and, through fierce competition we should be unable to continue payment of high wages to our workpeople, which, I think, we are all most anxious to do in order to avoid labour troubles.

The motor and motor cycle industries have rendered great service to the nation in the great war, and thereby deserve protection as some recognition of their services.

I hope an attempt will be made by British manufacturers to standardise their productions more and thus increase output. Most English firms produce far too many models, and give their customers too many options, which is fatal from a production point of view.

With the experience gained through the terrific "gruelling" experienced by despatch riders' machines during the four years of war, British motor cycle manufacturers should be in a position to produce post-war models as near perfection as possible, and all former weak points eliminated.

From Mr. P. F. Bennett, Chairman British Ignition Apparatus Association and Managing Director Thomson-Bennett Magneto, Ltd.

AS chairman of the British Ignition Apparatus Association, I feel bound to emphasise once more the facts as they are to-day in case there are any who have not realised the change that has taken place in the magneto industry during the period of the war.

First. The Government has been purchasing magnetos in enormous quantities for all classes of work. The result is that, at the present time, there is available an amply supply of magnetos for the British motor industry. The quantities produced by the British magneto firms are greatly in excess of the quantity that was imported from Germany before the war.

Secondly. The demand upon the efficiency of the magneto has been largely increased in severity to meet the needs of aero, tank, and other special work.

It is not too much to say that the safety of the Empire has been in the hands of the British magneto manufacturers, as without our Air Service and Tank Corps, Mechanical Transport, etc., we should never have won through. All these mechanical services have been dependent upon British magnetos. Realising this, there is no need for any anxiety as to the reliability of the British magneto for commercial purposes.

Thirdly. The demands of the Services have necessitated improvement in design, so that when the magneto factories are able to change over to magnetos designed in accordance with their war experience, the motoring public will have machines



Mr. Harold Bowden.

far in advance of anything they have previously known.

Lastly. We know exactly what the German has been doing, as the magnetos on crashed aeroplanes have been examined, and we know that had there been any startling new discovery the German Government would have had the benefit of it.

From J. W. Stocks, Pioneer Motorist and General Manager, Ariel Works, Ltd.

I WOULD like to thank the Editor for giving me this opportunity of wishing *The Motor Cycle* and its readers a Happy and Prosperous New Year.

The reconstruction period will necessitate some patience on the part of both buyers and suppliers—the former will be anxious to get machines as quickly as possible and the latter to assist them back to the memories of pre-war days.

One of the problems we have to face immediately is the question of prices. If the present high rate of wages is maintained, and the shorter hours do not result in increased output, everyone will have to pay higher prices all round, and I fail to see who will benefit. I think when it is appreciated that under existing conditions we cannot compete in the world's markets foreign competition will straighten out matters in due course.

What we require, without doubt, is a reciprocal tariff. Personally, I see no reason why my next door neighbour should be more offended because I charge him half a crown for coming into my house than I should be because he charged me the same amount to go into his.

From a business point of view most of us will have to look upon the last four years as a nightmare, particularly those firms who have had to devote practically the whole of their works to munitions of a kind quite different from their peace time productions, and start where they left off in 1914.

I am, however, sufficiently optimistic to think that when the petrol and other restrictions are removed there will be buyers to absorb the output of firms with up-to-date 1914 models for a year or two. Even those firms who are supposed to be ready with new models, in spite of the numerous extensions and facilities for increased output which have been made in nearly every works, will find the question of supplies of material a serious handicap. When the new Government gets into its stride, I think the restrictions which have taken over four years to introduce will be removed in practically as many months after peace is declared. Supplies will gradually overtake the demand, and by next November, when the cycle and motor exhibitions will again be welcomed, I think more normal conditions will prevail, though I do not for one moment anticipate that we shall be anywhere near normal prices.



Mr. J. W. Stocks.

Opinions.—

From Mr. Norman T. Downs, Managing Director of New Imperial Cycles, Ltd.

NOW that the war is ended the manufacturer is able to turn his thoughts to his normal productions, and, naturally, the prospect of improvements in motor cycles engages his attention.

So far as my company is concerned, we have designed, and, in fact, have been experimenting for some time with new models which embody improvements of considerable scope, but, owing to the suddenness of the close of the war, we have decided to defer the introduction of our newest models until the Olympia Show of 1919, and turn our attention to the production (with improved details) of our war models, as made for the Allied Armies.



Mr. N. T. Downs.

We shall specialise on two models only—a 2½ h.p. light tourist and the New Imperial 8 h.p. combination. By devoting ourselves to these two models we hope to obtain a larger output.

May we through your columns wish all motor cyclists a Happy New Year and a plentiful supply of petrol.

From Mr. Geo. Stevens, of A.J.S. Fame.

IF the motor cycling public will only be patient, now is the time for the motor cycle trade to put its house in order and determine that out of the anxieties and problems brought about by the war only good shall result.

As an expression of opinion I cannot say that the experience gained during the war has helped manufacturers in the matter of improved general design, but it will undoubtedly result in better and improved methods of production, which will ultimately result in not only reducing production costs, but will provide the rider with a more dependable and efficient machine. During the war manufacturers have certainly seen the advantage of:

1. Concentration on one model.
2. Quantity production.
3. Necessity for a more scientific knowledge of metals, their treatment, and their scientific distribution in design.

Other than the advantages which can be derived from the above, I suggest that the public will see very little change, either in general or detail design. That will come later when things become more normal.



Mr. Geo. Stevens.

From Mr. Geo. E. Rigby, of the Royal Ruby Cycle Co.

I AM certain there is a splendid era of prosperity before motor cycle manufacturers, and a tremendous output will be required to fulfil the demands both here and in our Colonies.

I am convinced the motor cycle buyers will demand up-to-date machines, with the very latest improvements, and, therefore, the manufacturers who put on the market their ordinary pre-war machines will not be satisfied with the results.

I am a very great believer in the future of the spring frame motor cycle, and when it is perfected I cannot see anyone buying the old rigid type, any more than anyone would think of now buying a motor cycle with a rigid fork or the motor car with a rigid chassis.

I have, therefore, spent a tremendous lot of time and money inventing, experimenting, and testing spring frame models, and, profiting by the experience gained during the war, I am placing a small number of models on the market in order to produce them in larger quantities.

From Mr. F. Hulbert, Works Manager, the Triumph Cycle Co., Ltd.

THE single-cylinder motor cycle has been my ideal machine since 1903, when I won the 200 miles reliability trial for the Edge Trophy on a Hulbert-Bramley fitted with a 2½ h.p. Minerva engine.

The most successful machine of the future, I consider, will be the one which will claim simplicity, efficiency, reliability, lightness, speed, power, and comfort, and I believe the single-cylinder can be built to these requirements.

Unfortunately, the good old days are past when Hart-Davies (who, alas! is no more), Lister-Cooper, and I used to make yearly tours to Birdlip and Sutton Bank to test our new machines, and the excitement in climbing these hills, when two and three-speed gears were unknown, was most enjoyable.

The advent of the three-speed gear has, of course, killed this sport, and even with a heavy sidecar attached a good single-cylinder machine will climb any hill on low gear, no matter how steep, so long as the back wheel will grip the surface.

This is why the A.C.U., in the Six Days Trials in 1914, went out of its way to find freak hills, which, to my mind, was most unfair to the manufacturers.

Owing to the length of these contributions and their unusual interest precluding condensation, we are continuing this feature in subsequent issues.



Mr. Geo. E. Rigby.

From Mr. W. J. Lloyd, of the Lloyd Motor Engineering Co., Ltd., Pioneer Designer and Maker of the L.M.C. Motor Cycle.

I THINK it is highly probable that my ideas on reconstruction will run very much in the same groove as the majority of manufacturers and designers in the industry. In any case, so far as my firm is concerned, we are standardising and simplifying construction with the idea of giving the public the best possible value for money.

As regards design in general, I am specialising on a spring frame Colonial model, particulars of which will be available shortly, when patent formalities are completed. Meanwhile, I use the term "spring frame" for convenience. Strictly speaking, it is more on the lines of a suspension frame, being an evolution of various ideas I have worked upon for the last twenty-five years.

The idea is to get away from a multiplicity of joints. Incidentally, I brought out a spring frame bicycle some twenty-five years ago, which was very successful, and in this suspension there were only two joints.

From Mr. W. H. Carson, of the Excelsior Motor Co., Ltd.

NOW that the time has come for us to return to our staple industry, the question of reconstruction is one of great importance, especially to those firms who have been engaged on other than motor cycle manufacture. Many of the employees accustomed to motor cycle building have been claimed by the Army, and doubtless it will be some time before they are permitted to return to their civilian occupation.

During the past four years the conditions under which motor cycles have been used have brought about many important developments, such as

stronger frames, larger diameter wheel spindles, more ground clearance, heavier gauge spokes, better mudguarding, etc.

Those of us who have been employed in other directions must not be satisfied to recommence where we left off in 1914, but must give riders the benefit of all developments which circumstances have made it clear must be adopted.

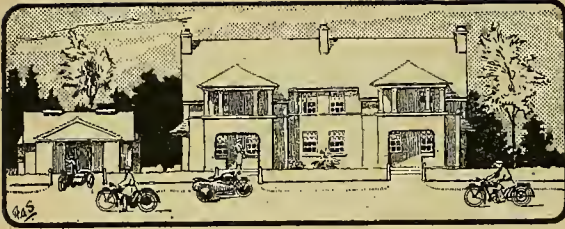
To market new models embodying these features will be a matter of time, especially as many firms will be engaged on completion of Government contracts.



Mr W. J. Lloyd



Mr. W. H. Carson



THE GARAGE PROBLEM

The Motor Cycle—where to keep it ???

THIS is a day of problems, and demobilisation and reconstruction provide the majority of them. Complex social and commercial matters have to be decided. Health and housing questions will have to be solved, and for the motoring public of the future, I venture to add, the problem of garaging.

The questions of housing and garaging are intimately connected, and there are several points of fact from which to commence their solution.

As demobilisation proceeds huge numbers of men will return to civil life, a fair proportion of whom, probably tens of thousands, have been intimately connected with motors on war service, many of them having had no previous knowledge of the internal combustion engine. These men will not be content to revert to shanks's pony or the push cycle either for business or pleasure. They are all potential purchasers of motor cycles, with or without sidecars.

Manufacturers, in appreciating the demands of this newly-developed market, will no doubt turn out motor cycles in numbers far exceeding any pre-war production. It is common knowledge that every maker is preparing for a larger output than heretofore.

The problem of storage now arises. The modern house is the most inconvenient place imaginable in which to keep a motor cycle. In most cases no outbuildings are provided, and even where they are, narrow front, back, or side entrances, or flights of steps, effectively preclude the entrance of a motor cycle. When the thousands of new houses, which election candidates have so glibly promised, materialise, it can safely be asserted that nine-tenths of them will be designed without a thought for the accommodation of even a bicycle, not to mention a motor cycle, and in any case the erection of such houses will take several years; in the meantime both new-comers to motoring and old-timers will be hard put to find the necessary cover for their machines.

The motoring world will soon have before it the prospect of large numbers of motor cyclists all clamouring for garage accommodation which does not exist. There are several ways of coping with this *contretemps*.

(1.) The agent who sells the machine, as an offshoot from his business, can run a series of garages for his purchasers.

(2.) The motor cyclists in any particular district can club together and rent some suitable building, or even build a properly equipped garage for their combined use on a conveniently situated plot of land.

(3.) There is a fine chance for speculative members of the building trade to erect communal garages on a big scale, but motor cyclists should strongly oppose any profiteering schemes which may be forced upon them.

(4.) Architects and builders of houses, whatever the value, should endeavour to provide, for either each house or group of houses, reasonable outbuildings properly designed to accommodate motor cycles—or cars, according to house values.

(5.) Garages could be erected and maintained by the local authorities, and the cost and expense charged by a special rate on the town's motoring inhabitants.

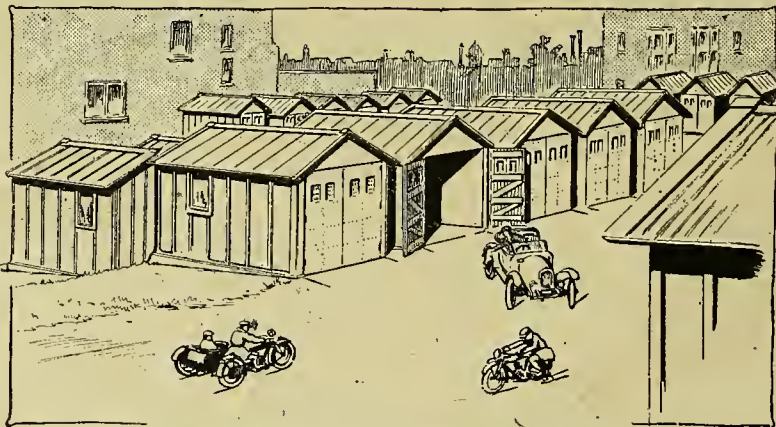
The first two suggestions are more applicable to the near future. The third and fourth ideas will undoubtedly be useful, in a lesser or greater degree, in due time, but for the moment the letting of suitable

existing buildings by the owners, or the renting and sub-letting by the motor agent or by a motor cycling community itself, are the principal ways in which garaging accommodation can be quickly provided. There must be many buildings in most towns which will become available with the cessation of war work. Many of the munition firms will have temporary shedding to

dispose of, which can be taken down and re-erected elsewhere.

The fifth idea, the municipal garage, savours of Utopia. Many local authorities are not yet so kindly disposed to the motoring fraternity as to consider such a proposition seriously, but, looked at from the point of view of public health, the idea is not so absurd as it may seem; motoring makes for good health, so does bathing; public baths are provided in all cities as a matter of course, then why not garages?

The majority of new motor cyclists will have to consider garage expenses as a necessary part of the running costs in the future. The rentals of any



How waste and uneven ground may be utilised for lock-up motor cycle sheds. There are many such pieces of ground available, even in thickly populated districts.

The Garage Problem.—

garages, such as here suggested, would vary considerably. The cheapest method will be that run by groups of motor cyclists without profit, except to provide a small surplus for building repairs and upkeep. A management committee, with secretary and treasurer, would seem to be necessary where this idea is carried out on a large scale. The agent who provides accommodation will quickly arrive at a limit; he cannot go on providing garage room for ever, but whatever he does in this way, the rentals asked should be kept as low as possible, or he will find it a serious deterrent to his sales. A reasonable figure which will just clear expenses is the best incentive he can give to a would-be purchaser who is faced with the accommodation difficulty.

Communal garages are much in vogue in the States, and not a few exist in this country, more particularly for car users, but unless the idea is developed quickly while yet the purchase of machines in a great many cases is under consideration, and before demobilisation frees many potential motor cyclists, there will be trouble in the wind for the motor cycle trade; no one will buy a machine if he has no place in which to keep it. He cannot leave it in the street, he cannot get it into his house, and all existing garages are full—what is he to do? The answer in many cases will be, "No garage, no motor cycle," unless a very special effort is made to provide the necessary accommodation.

I recommend this subject particularly to the notice of all motor agents, property owners, architects, and builders.

F.A.S.



A co-operative garage built on the plan outlined above is one way of solving the storage problem. All the sheds are heated and fitted with electric light. Ample room and convenience exist for washing down machines.

THE BLACKBURNE PROGRAMME.

Engines with Outside Flywheels in Four Sizes.

THE Blackburne engine with its outside flywheel for some time has been regarded as ideal by many motor cyclists, and it may come as welcome news that Messrs. Burney and Blackburne, Ltd., are introducing a complete range of their engines as units for manufacturers to fit, and also three models of motor cycle embodying them.

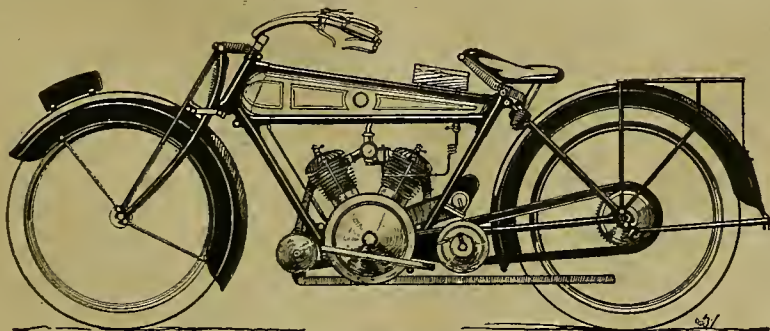
Two Singles—Two Twins.

These engines are $2\frac{3}{4}$ h.p. and 4 h.p. singles and 8 h.p. and 10 h.p. twins, all with outside flywheels and embodying the well known Blackburne features, such as detachable heads. The respective sizes of these engines are $2\frac{3}{4}$ h.p. (71×88 mm.), 348 c.c.; 4 h.p. (85×88 mm.), 499 c.c.; 8 h.p. (85×88 mm.), 998 c.c.; and 10 h.p. (85×97 mm.), 1,100 c.c.; and they

will be offered in both air-cooled and water-cooled types.

The three motor cycles will be a lightweight with two-speed countershaft gear, clutch and kick starter, chain-cum-belt transmission, and $26 \times 2\frac{1}{4}$ in. tyres, to sell at £60; a 4 h.p. model, with three speeds, $28 \times 2\frac{1}{2}$ in. tyres, all-chain drive, etc., £82; and 8 h.p. combination with 28×3 in. detachable wheels, all-chain drive, etc., £125. All machines will be fitted with Brampton Biflex forks.

The new lightweight Blackburne, especially, should make a very strong appeal, as very few engines of this size are now available. Several makers have introduced such engines, and among them may be mentioned the A.J.S., Sunbeam, Diamond, Hobart, Ilston, Precision, and New Hudson, but many are discontinued.



The 8 h.p. Blackburne, one of three machines to be manufactured in 1919.

RECONSTRUCTION— What Have We in View?

Reconstruction is the Keynote of Future Progress.

WE have to build up an Empire worthy of the men who have died for it and us. We are called upon to be the architects as well as the builders. We have to plan and prepare as well as to erect on sure foundations.

Out of the stress and agony of the years of war there has come to us a wider vision, a deeper consciousness of what is true and beautiful, the desire to erect a structure that shall live through the ages as typical of the greatness we have achieved and the greater things to which we aspire.

The First Steps.

We must start on our work untrammelled by the narrowing, selfish, and unenlightened conditions of the past. We must give very practical expression to our aims and ideals. We want to make our Empire a better place in which to live for all the sons and daughters of the Empire, not, incidentally, for a favoured few only. How are we to set about it? What are the practical things which must be dealt with in a practical fashion? Let us confine ourselves to material things, glad, indeed, if they may be furnished by contact with things spiritual, but being ourselves content to work in our own appointed field with the measure of vision granted to us, small though that be. So let us take the improvement in rates of wages and the better housing conditions which are immediately demanded by the manual workers—and not they alone—as the first step towards the abolition of poverty and the raising of the level of social life. For poverty is a crime in the well ordered State, whatever the proverb may say to the contrary. The housing problem cannot be settled by the individual: it is a matter for the State. The wages question, on the other hand, is a matter for the individual, chiefly for the individual manufacturer and agriculturist, for these are the real producers of wealth. The industries of the Empire are the springs from which flow the Arts and Sciences and all things good and beautiful. The “superior person” and the “idle rich” may no longer sneer at industry. Indeed, we have no room either for the superior person or the idle rich in the new state which we are building. But this is by the way. We are writing on the question of wages.

Unlimited Output the Solution.

These must be maintained at a far higher level than in pre-war days. Labour claims—and rightly claims—a far larger share of the profits of its labour than it formerly obtained, and, in any case, it insists—and again rightly—upon a minimum standard, which shall provide for the decencies and comforts of life, as well as for some of the so-called luxuries—we mean those things which should not be regarded as luxuries, but should be common to the lives of us all.

How is the manufacturer going to satisfy this demand? Well, it can only be met if the employers and workers each do their fair share of the task. Manufacturers must take full advantage of all the improved methods of production, scientific organisation, costing systems, the latest and best machinery, the employment of the best available brains, and “quantity production.”

There is no danger of over-production, at all events for years to come; but an intelligent, active sales organisation, covering the markets of the world, is the necessary complement to “quantity production.”

On the part of the workers there must be an end for ever to the stupid “ca canny” policy of the past. Each one must contribute to the output to the full extent of his power and be paid in full measure, according to the value of his contribution: in other words, payment by results.

Let us apply the argument to a particular case—that of the motor cycle industry. What is to prevent this industry developing, on the lines indicated, immediately? Here we think we write with actual knowledge of the facts of the case. There is probably no industry in the country better able to respond to the new spirit of the age than this, for it is on the eve of an extraordinary stage of development and progress, which, rightly understood and directed, means prosperity and all the good things that implies for all engaged therein.

An Estimate.

It may be rash to give figures which can be quoted against one at a later date, but we believe that there will be at least one and a half million motor cyclists within the confines of the British Empire as soon as machines can be made and supplied. Who is going to supply them, by the way, if not the British manufacturers? Obviously our American cousins in the main. We need not worry about our American cousins—one would rather say “brothers” now that we know their quality—at the moment, but we shall have to worry about them presently if the British manufacturers fail to realise the really wonderful opportunity now open to them, and fail also to realise that it can only be dealt with by “quantity production.”

They must think in thousands—in tens of thousands—and not in hundreds, as they have for the most part been accustomed to do. There is no difficulty in the way which cannot be overcome by intelligently directed energy and a wide and long vision. We know it means factory extensions, more plant, and more capital. All these can be provided for, and with much less delay, in our opinion, than is commonly believed.

Reconstruction—What Have We in View?—

No, the trouble is not in most cases that these difficulties are in the way, but rather that, with few exceptions, the possibilities of the future have not been clearly visioned. This is mainly because, among manufacturers, all thoughts have been concentrated upon war efforts.

But there can be no doubt of the issue in the mind of any person of intelligence who has found time to think of these things amidst the stress of war conditions, as some of us have contrived to do.

The future of the British motor cycle industry is one of assured success and prosperity if manufacturers will grasp their opportunities boldly and workers do their part loyally and thoroughly

To help to that particular end, we urge the formation of a National Industrial Council for the industry, with a workshop committee in every factory. Co-operative effort, a spirit of comradeship between master and man, a full recognition of the claims of labour, of administrative ability, and of capital. These things *must* be if we would build up the industry to the dimensions it should reach.

In so building up we shall do our share, in our own little corner, not only towards building up prosperity and happiness for all concerned in the industry itself, but also in the creation of a new and better country and Empire for the benefit of the generations to come, and so contribute our quota to the problem of reconstruction.



The lightweight motor cycle will play an ever increasing part in the life of the worker. "Back to the land" is a cry very persistent just now, especially in regard to soldiers and women workers. Housing accommodation being difficult to obtain in the country, the motor cycle will be largely employed to traverse the distance between home and the holding or the farm.

THE FUTURE AND THE LIGHTWEIGHT.

SOONER or later will come a time when every other man and every third woman will possess a lightweight motor bicycle. It will be used for shopping, for running to business and back, and for running to pleasure and back. It will certainly not be a hermaphroditic over-elaborated automobile de luxe on two wheels. It will be of a definite and distinctive breed which knows how to preserve its own identity and does not wish to ape its betters or pretend it is a colonial model, or a light sidecar machine, or half a motor car. It will be as the present bicycle for use and ubiquity, but it will be a saver and not a consumer of human energy. It will be the simplest combination of the simplest forms of engines, gears, and wheels. It will be "lightness combined with strength" *in excelsis*. It will be a hack not a Bucephalus. Thousands will buy it. Indeed, it will become so common that in time it will be the real and

true *omnibus*. The miner, the mechanic, the weaver, and the wood-worker will use it to get to and from work. Every large firm will need a special shed for storing machines, and the workpeople will club together to provide an attendant. None but the aged will be seen in the trams, and the suburban trains will cease to crawl. Large factories will arise turning out the workers' motor bicycle in thousands. Every ironmonger, tinsmith, paint and paraffin dealer will have exposed for sale in his windows two or three machines, and he will be able to supply parts and spares from stock. There will be no local repairing in the present accepted sense. Renewals will be cheaper than repairs.

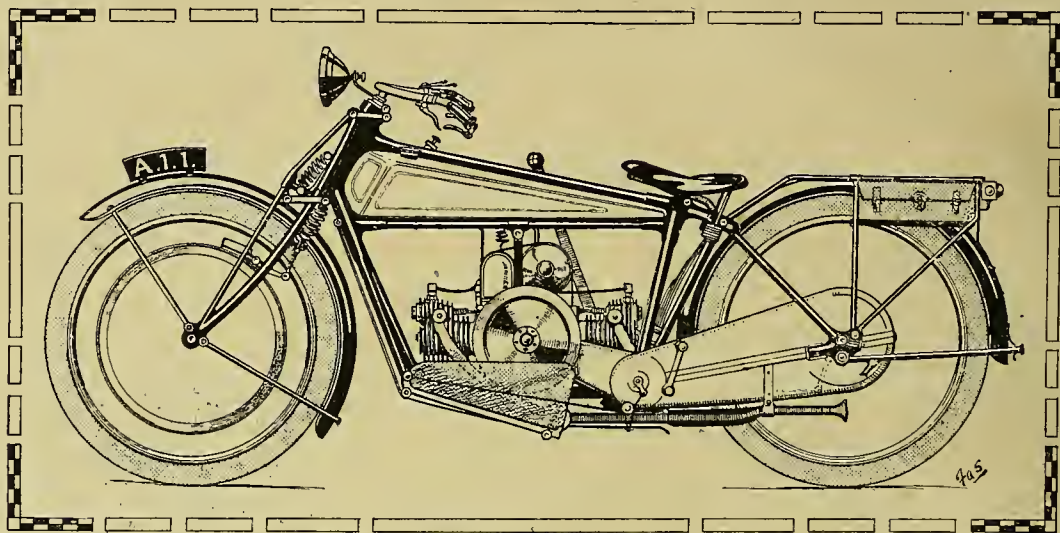
Soon we shall see the beginning of that new epoch when every household will think it no more remarkable to possess a motor bicycle than it does to possess a mangle or a sewing machine.

C.R.E.

WHICH TYPE?

The Result of the Referendum Voting reveals the Great Popularity of the Flat Twin and the Single-cylinder Engines.

THE IDEAL SOLO MACHINE: THE DESIGN EMBODYING THE IDEAS OF THE MAJORITY.



The Ideal Specification.

ENGINE: $3\frac{1}{2}$ h.p., short stroke, 500 c.c., four-stroke, flat twin, air-cooled.
CARBURETTER: Two levers.
MAGNETO DRIVE: Gears, central position.
LUBRICATION: Hand pump, forced feed, and throttle controlled.
GEAR RATIOS: Four.
TRANSMISSION: All chain.
TYPE OF GEAR: Dog clutch engagement.
CLUTCH: Dry plate, multiple, cork inset.
FRAME: Sprung, diamond, duplex.
FORK: Druid type.
SEAT: Sprung saddle.
HANDLE-BARS: Semi-T.T.
BRAKES: Front in V rim; rear, expanding.
WHEELS: Detachable, $26 \times 2\frac{1}{2}$ in.
LIGHTING: Dynamo.

The Winner's Specification.

ENGINE: $3\frac{1}{2}$ h.p., medium stroke (square), 500 c.c., four-stroke, flat twin, air-cooled.
CARBURETTER: Two levers (semi-automatic).
MAGNETO DRIVE: Gears, central position.
LUBRICATION: Hand pump, forced feed, and throttle controlled.
GEAR RATIOS: Four.
TRANSMISSION: All chain.
TYPE OF GEAR: Dog clutch engagement.
CLUTCH: Dry plate, multiple, cork inset.
FRAME: Sprung, diamond, duplex.
FORK: A.B.C. type.
SEAT: Sprung saddle.
HANDLE-BARS: Semi-T.T.
BRAKES: Front, expanding; rear, expanding.
WHEELS: Detachable, $26 \times 2\frac{1}{2}$ in.
LIGHTING: Dynamo.

Notes on the Specifications for Solo Machines.

IT may not come as a surprise that the ideal specification for a solo machine which has been compiled by the voting of our readers is for an opposed twin of $3\frac{1}{2}$ h.p. Nevertheless, the $3\frac{1}{2}$ h.p. single was a very close second, so it may be said these two types offer the greatest possibilities to manufacturers.

In the voting, the flat twin leads all other types, although not sufficiently to permit one to assume that no other one is worth considering. The opposed twin finds favour with 40% of the entrants, while 36% specify the single. In round figures, other types were represented as follows: V twins 13%, four-cylinders 5%, less conventional types 6%. The object of the referendum, however, was not so much to find a

winner as to give the manufacturers some idea of the proportionate popularity of all points, and in this connection there is no doubt that the data now available will be of great assistance to the designer. This will be published in another article next week.

The ideal specification makes a composite machine which is illustrated above, and, while not departing from accepted practice, there are very few makers producing such a machine. The number of flat twin machines on the market at present are limited to less than half a dozen makes, therefore it is easy to compare their specification with that of the composite model. First, however, it should be noted that the type of spring frame shown in the drawing in no way

Which Type?—

indicates the suspension system readers had in mind. Our artist has drawn upon his imagination here.

In brief the specifications of existing $3\frac{1}{2}$ h.p. flat twins are given below:

A.B.C. (pre-war design).—All-chain drive, spring frame, four speeds. (This model in all probability will be abandoned.)

Brough.—All-chain drive, rigid frame, three speeds.

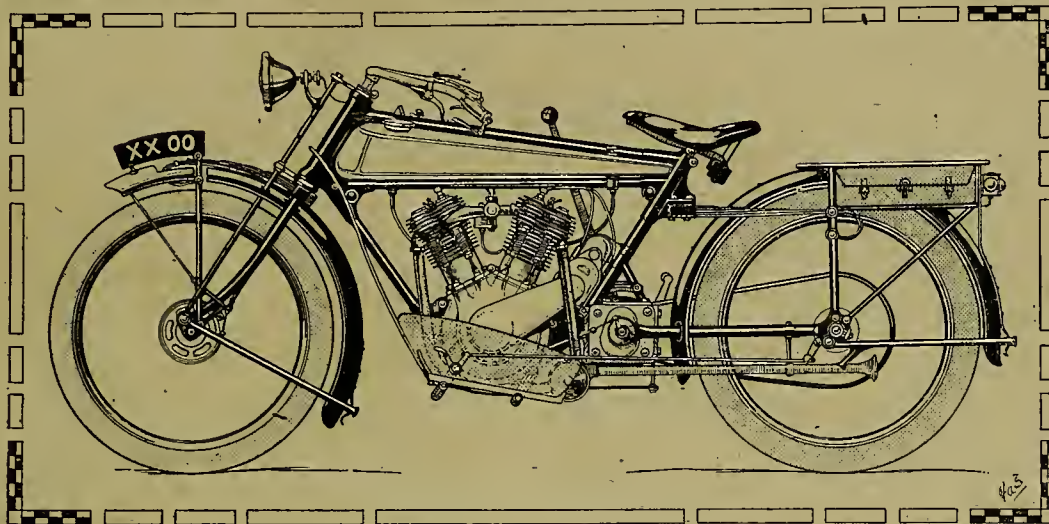
Bradbury.—All-chain drive, rigid frame, three speeds.

Douglas.—Chain-cum-belt, rigid frame, three speeds. The Peace model will have a spring frame.

Humber.—All-chain drive, rigid frame, three speeds.

The prize for the specification embodying the greatest number of points contained in the composite has been awarded to Mr. A. Woodman, of Blencathra, Maidstone Road, Chatham, whose specification is published.

THE IDEAL SIDECAR MACHINE: THE DESIGN EMBODYING THE IDEAS OF THE MAJORITY.



The Ideal Specification.

ENGINE: 8 h.p., long stroke, 1,000 c.c., four-stroke, V twin, air-cooled.

CARBURETTOR: Two levers.

MAGNETO DRIVE: Gears, behind engine.

LUBRICATION: Mechanical and hand pump.

GEAR RATIOS: Three.

TRANSMISSION: All chain.

TYPE OF GEAR: Dog clutch engagement.

CLUTCH: Single dry plate, cork inset.

FRAME: Sprung, diamond, straight tubes, girder.

FORK: Indian type.

SEAT: Sprung saddle.

HANDLE-BARS: Semi-T.T.

BRAKES: Front, contracting; rear, expanding.

WHEELS: Detachable, 28 x 3in.

LIGHTING: Dynamo.

The Winner's Specification.

ENGINE: 8 h.p., long stroke, 1,000 c.c., four-stroke, V twin, air-cooled.

CARBURETTOR: Two levers.

MAGNETO DRIVE: Chain, behind engine.

LUBRICATION: Hand pump, forced feed.

GEAR RATIOS: Three.

TRANSMISSION: All chain.

TYPE OF GEAR: Dog clutch engagement.

CLUTCH: Multiple, dry plate, cork inset.

FRAME: Sprung, diamond, straight, duplex.

FORK: Brampton Biflex.

SEAT: Sprung saddle.

HANDLE-BARS: Semi-T.T.

BRAKES: Front, expanding; rear, expanding.

WHEELS: Detachable, 700 x 80 mm.

LIGHTING: Dynamo.

Notes on the Specifications for Sidecar Machines.

IN the sidecar group, the V twin leads the opposed engines by a considerable margin, while the four-cylinder and singles are in the third and fourth positions respectively. It was more difficult to find the winning specification from the forms sent in by the big twin enthusiasts. The award, however, was eventually granted to Mr. G. F. Halliday, of Howcans, Boothtown, Halifax. The specification sent in by Lt. Vivian I. R. Clark, R.E., totalled almost as many points, but, although he voted for straight tubes, he qualified this item by mentioning his choice of frame as Indian, which, of course, has not straight tubes. The Indian type of forks, for which the majority

voted, was mentioned by him, but Mr. Halliday mentioned 1,000 c.c., whereas Lt. Clark's ideal was given as 930 c.c. The latter gentleman's choice in carburettor control, too, lost him a point.

The composite specification resembles those of the Indian and the post-war Clyno, but in all probability several machines of this type will be marketed ere long.

It is perhaps rather surprising that for sidecar work the three-speed gear gained a larger vote than four ratios, especially as the "four" led in the case of the solo machine. All-chain was easily first as an ideal transmission.

Comments on the Plebiscite.

IT is interesting to note that both winners are experienced riders owning up-to-date machines. Mr. Woodman informs us that his present mount is a 4.5 h.p. twin countershaft Zenith, astride which he tells us he has "enjoyed many a priceless hour," both solo and with sidecar.

Mr. Halliday's present machine is an 8 h.p. Sunbeam with dynamo lighting set, and his experience includes riding in South Africa.

Solo Engines.

Among the solo specifications there were a good proportion of those which were considered to be ideal for a dual purpose mount, yet the 500 c.c. engine came out on top with 32.7%, 550 c.c. being second with 21.5%, and 600 c.c. third with 9.8%, while the 650 c.c. engine scored 5%, equally with the 350 c.c. size.

The 300 c.c. engine scored only 3.8%, but below this size no reader gave a vote, while there were quite a number of large engines—up to 1,100 c.c., in fact—specified, both for dual purpose and purely solo work.

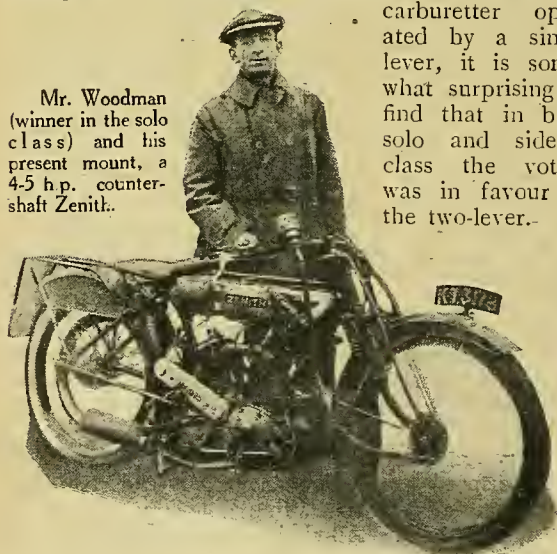
The Engines of the Sidecar Machines.

Despite the large number of readers who undoubtedly desire a machine which can be used as a dual purpose mount, *i.e.*, a single or twin between 500 and 600 c.c. capacity, the larger capacity engines received the biggest number of votes. That 1,000 c.c. was regarded as the ideal by no less than 31% may cause some surprise, since in pre-war days the tendency was toward a 750 c.c. engine. The latter only scored 19.8%, and was the next in order, followed by the 600 c.c. engine with 7.2%, and the "550" with 6.8%.

Larger engines than these, however, increased the big engine proportion by other sizes slightly more than 1,000 c.c., *i.e.*, 1,050, 1,100, 1,200, and even 1,500 c.c. were mentioned, while those between 800 and 950 represented a further 16%. The 500 c.c. engine was represented by 4.96%, which rather goes to show that a few users of the old-time 3½ h.p. are perfectly satisfied with such a machine for sidecar work. Considering the apparent advantages of the automatic

carburettor operated by a single lever, it is somewhat surprising to find that in both solo and sidecar class the voting was in favour of the two-lever.

Mr. Woodman (winner in the solo class) and his present mount, a 4.5 h.p. countershaft Zenith.

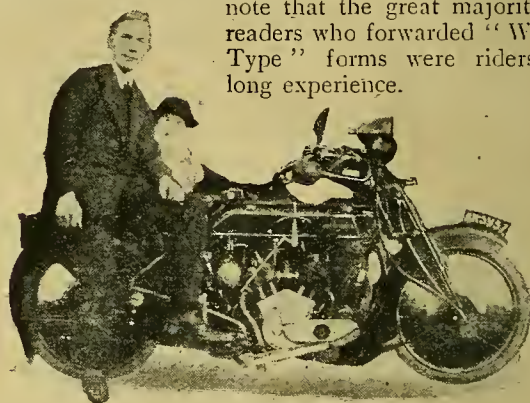


In the sidecar class over 60% voted for 28 x 3 in. tyres, while the 26 x 2½ in. size was regarded as ideal by 32% of the voters in the solo groups.

The Ideal Solo Single.

Taken separately, the specifications of single-cylinder solo machines made up a composite specification as follows: Long stroke 3½ h.p. four-stroke, air-cooled, gear driven magneto behind the engine, semi-automatic two-lever carburettor, all chain transmission, three-speed gear, dog clutch engagement, multi-dry-plate clutch, diamond spring frame, Druid type forks, front brake in V rim, rear brake contracting on hub. Tyres 26 x 2½ in., detachable wheels, semi-T.T. bars, dynamo lighting.

The reader whose specification came nearest to this composite is Mr. R. E. Kay, 43 T.A.S., R.A.F., Chattis Hill, near Stockbridge. It is interesting to note that the great majority of readers who forwarded "Which Type" forms were riders of long experience.



Mr. Halliday and his 8 h.p. Sunbeam.

The composite V twin was practically the same specification excepting that a 6 h.p. engine was substituted, while the ideal "four" included 1,000 c.c. long stroke air-cooled engine, combined with four-speed gear box, shaft driven magneto, sprung frame, 28 x 3 in. wheels.

Some Other Opinions.

One reader in voting for a flat twin added a rider to the effect that this type was his ideal only for the present, and that he favoured a water-cooled four-cylinder when weight could be reduced. Another suggested that the W.D. finish be retained, and several mentioned the desirability of lugs being built into the frame for sidecar fittings.

The conventional was departed from by several readers, and among the many items considered as ideal were quite a number of 90° twin engines, a few side-by-side twins and three-cylinder engines, magnetic, hydraulic, and friction transmissions and roller gears. Integral engines and gear boxes, too, were mentioned.

The result of the "suggestions" competition will be announced later, when we have had an opportunity of judging the huge quantity of letters received.

Quite a large number of forms came to hand after the closing date; in fact, every day forms still reach us from distant parts of the kingdom. In the meantime, the forms from Overseas have commenced to arrive in large numbers.



RIDER AND MAKER.



The Manufacturers from the Rider's Point of View.

MOTOR cycle manufacturers are more often "cursed" than blessed by the rider, despite the eulogistic remarks that are published occasionally in catalogues and advertisements.

In my early wheeling days youth and enthusiasm caused me to regard the manufacturer of a bicycle or a motor bicycle as a supernatural being, and one with whom I wished to be on particularly good terms. I imagined him sitting up at night with a wet towel round his head and a cup of strong coffee at his elbow, working out problems for the increase of my pleasure and recreation. Alas! my imagination was too keen. I have since discovered that he seldom does these things. A motor cycle maker is not always a rider of the machines he sells; there are exceptions to prove the rule, but the majority do not gain that valuable first-hand experience that alone can make the really successful producer.

"Ready for the Road."

Having thus aired a grievance, here are a few items for post-war policy which would ameliorate the lot of riders and improve our commercial relations Overseas.

I understand that most motor cycle manufacturers subscribe to an organisation which I imagine was formed to unite them for the common weal, viz., to benefit themselves. If this is so, then many of the reforms for which riders have combated will take longer in coming. Standardisation is one item, and when it comes I trust it will be made to apply not only for the makers' but the riders' benefit. It is safe to say that the production of motor cycles will increase during the next few years, and naturally if practically each maker has a different thread for nuts and bolts, it means that when standardisation becomes an accomplished fact huge stocks will have to be scrapped. If standardisation in threads were adopted immediately while the stocks are small and the tools about ready for renewal, the cost to the trade would be much less.

Another item in which makers are very much to blame is concerning the supply of tools and accessories. In some instances they are mean to a degree in connection with the outfit. Everyone knows what a pleasure it is to receive a well-equipped machine, with tools to fit every nut, also special tools for parts difficult of access. Unfortunately, the makers who adopt a liberal policy in this direction are few and far between.

A motor cycle maker advertises to sell a complete machine. How often, however, is it incomplete? A complete machine is one that is ready for the road; it should be supplied with lamps, warning instrument, speedometer, number plates, etc., and there should be nothing for the purchaser to add before he can take the machine on the road.

It only requires the accessory makers and the machine makers to get together to evolve a standard method of fitting for the accessories and for proper permanently fixed attachments to be fastened to the frame, handle-bars, etc., during the process of manu-

facture. This would dispense with flimsy clips which the accessory firms are compelled to supply because the motor cycle manufacturer does not embody these fittings in his design. What has made the great success of the Ford car apart from its price? In my opinion it is the fact that, when the car comes out of the works it is complete, and the owner knows that he will be able to use it at once in daylight or darkness without disbursing an extra penny for accessories.

In many instances the manufacturer's guarantee is not liberally interpreted; in fact, I would go further and say that the printing of it in many catalogues is a form of legal verbiage intended to exonerate the manufacturer from blame in the event of an accident, and to wipe out his liability to replace any part which should happen to go wrong—I will not say break or prove defective, breakages obviously would be replaced for the sake of his reputation.

I only draw attention to guarantees, as printed in catalogues, because I consider they are too one-sided. Also they do not cover a sufficiently long period. Three months to six months is far too short. Also there is no clause deciding whether the date of the guarantee extends from the day the machine leaves the works, or the day when the agent succeeds in selling it to a purchaser.

Then I come to a grievance which I have often heard expressed among riders of the touring class as distinct from those who take part in weekly competitions; it is that the ordinary purchaser is barely considered in comparison with the attention paid to a skilled competition rider. I hear that these riders are supplied with any number of spare parts, their machines are tuned up regularly at the works, and hosts of other minor attentions are shown to them. Doubtless their performances bring business to the manufacturer, and it is only human nature for the manufacturer to study their requirements; but he should not forget that the real support of his business is the ordinary purchaser who outnumbers the competition rider in the proportion of a hundred to one.

The Connecting Link.

I hope that no manufacturer who honestly desires to benefit the rider while making a legitimate profit for himself will consider my suggestions are written in a spirit of carping criticism, but with the hope that the British motor cycle industry will continue to hold the leading position in the world, and it is only by improving manufacturing and commercial methods that this supremacy will be maintained.

The link between riders and manufacturer is, undoubtedly, the pages of *The Motor Cycle*, and in justification of my views and criticism is a strong desire, as an enthusiastic rider, to witness the supremacy of British-made goods. The British motor cycle industry is at the top of the pinnacle, due to the perfection of its manufactured articles. This undoubtedly comes first, but next to it is liberality in business as apart from conservative narrow ideas.



SPECIAL FEATURE

OPINIONS. WHICH TYPE? RESULT OF REFERENDUM.
EMPIRE TRADE.

TIME TO LIGHT LAMPS

GREENWICH TIME.

Jan. 2nd	...	4.30 p.m.
" 4th	...	4.32 "
" 6th	...	4.35 "
" 8th	...	4.38 "

Three-inch Tyres on Lightweights.

Messrs. Humphries and Dawes, Ltd., will fit 26x3in. tyres to their peace model lightweight.

An American Motor Cycle School.

During the war American motor cycle mechanics have been trained in a special school in the Harley-Davidson factory.

The A.C.U. Petrol Licences.

The secretary of the A.C.U. informs us that he greatly regrets the delay which has recently occurred in his office in dealing with queries relating to petrol licences. This has been unavoidable, owing to the fact that the Petrol Controller's Department has temporarily run out of the correct forms upon which application must be made.

Death of the Motor Trade Statistician.

We have to announce the death of Mr. Harry Hewitt Griffin, whose name will be familiar to many readers of *The Motor Cycle* in connection with the motor cycle show statistics which he compiled for this paper, and which at one time were a feature of our reports of exhibitions. Mr. Griffin was also responsible for the annual census of road traffic in various parts of the Metropolitan area. He was associated with the cycle trade in the early days, and a keen follower of cycle racing.

A Woman Soldier Motor Cyclist.

According to the Paris *Daily Mail*, a Madame de Gouraud Morris has been on active service as a motor cyclist. She took part in the Seine swimming race on Christmas Day as the only woman competitor.

An Old-time Motor Cyclist.

We hear that Mr. H. Belcher, one of the oldest motor cyclists in the country, has severed his connection with Messrs. A. R. Atkey and Co., Ltd., and bought the business of Messrs. R. Cripps and Co., Ltd., Lower Parliament Street, Nottingham.

The Price of Petrol in France.

There seems to be a good deal of profiteering in the sale of petrol in France. Prices are high, as 1.50fr. (about 1s. 2d.) a litre is being asked, and as there are approximately five litres to the gallon the price per gallon would come out at something like 5s. 10d.

Petrol is dear enough in all conscience in this country, but evidently it is not so dear as in the land of our Allies across the Channel. It seems rather hard to imagine why they should have to pay so much more than we have to.

The Industrial Reconstruction Council.

The first lecture of the second series arranged by the Industrial Reconstruction Council will be held in the Saddlers' Hall, Cheapside, E.C.2, on Wednesday, January 8th. The chair will be taken at 4.30 by the Marquess of Crewe, K.G., and a lecture entitled "Industrial Unity" will be delivered by the Right Hon. G. H. Roberts, M.P., Minister of Labour. Applications for tickets should be made to the Secretary, I.R.C., 2 and 4, Tudor Street, E.C.4.

Sale of War Machines and Parts in France.

The following prices were obtained for some of the rejected Army motor cycles sold by Government representatives in Paris recently: Griffon, £17; Moto-Rève, £6; Peugeot, £10; Rover, £44; Royal Enfield, £24; and Triumph, £20.

Sidecars fetched from 10s. to £4 each, so the condition of the lowest-priced sidecar can be left to the imagination.

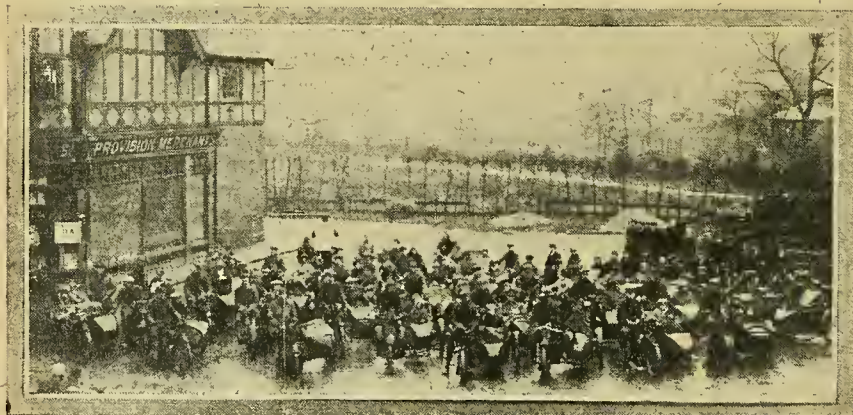
Belts were sold in lots of 800 and 1,000, and a quantity of acetylene generators and large numbers of parts for cars, such as gear boxes, back axles, steering, brakes, etc., were sold at the same time.

1919 PRICES.

"ALLON, two-stroke, two-speed, and clutch	...	£55	0	0
ALLON, two-stroke, two-speed, and clutch, with kick-starter	...	65	0	0
ARIEL, 3½ h.p.	...	80	0	0
" 3½ h.p. Sidecar Outfit	...	106	0	0
BLACKBURN, 2½ h.p., two-speed clutch	...	60	0	0
BLACKBURN, 4 h.p. three-speed	...	82	0	0
BLACKBURN, 8 h.p. Combination	...	125	0	0
B.S.A., 4½ h.p. Model, with all-chain drive	...	81	18	0
B.S.A., 4½ h.p. Model, with chain-cum-belt drive	...	79	16	0
B.S.A., 4½ h.p. Sidecar	...	29	9	0
DOUGLAS, 2½ h.p. W.D. Model	...	60	0	0
DOUGLAS, 4 h.p.	...	75	0	0
DOUGLAS, 4 h.p. Combination	...	95	0	0
LEVIS, single gear	...	38	0	0
MATCHLESS, 8 h.p. Military Model Combination	...	140	0	0
NEW IMPERIAL, 2½ h.p., two-speed	...	50	8	0
NEW IMPERIAL, 2½ h.p., two-speed clutch	...	56	16	0
NEW IMPERIAL, 8 h.p. Combination	...	126	0	0
P. and M., 3½ h.p.	...	78	0	0
P. and M., 3½ h.p. Combination	...	102	0	0
TRIUMPH, 4 h.p. W.D. Model	...	85	0	0

Petrol Substitutes from South Africa.

South Africa has already given one petrol substitute to the world in the shape of Natalite, though, unfortunately, it is true that practically none has yet reached this country. Now a new product of a similar nature has been announced in the same part of the world, under the name of Penrol. This fuel appears to be very similar to that recently described in *The Motor Cycle* in an article entitled "Alcohol Carbide Fuel." It consists of pure alcohol saturated with pure acetylene, and having 0.3% of acrolein added, but as far as is at present evident this fuel is not based on the American experiments we described. It is claimed for the new fuel that it is both cheaper and more economical in use than petrol at its present price.



The recent meet of the Sheffield and Derby branches of the N.M.C.F.U. at Matlock. The weather was decidedly unfavourable, and the run demonstrated the inefficiency of the average mudguard. Over a hundred motor cycles were present, all but four being combinations.

Better Mudguarding.

Manufacturers are giving this matter attention, but to obtain the ideal result is "easier said than done."

A Trade Entrant.

Mr. Rex Mundy, the well-known competition rider, is opening a motor cycle depot at Brighton.

A Curious Address.

The Johannesburg depot of the Dunlop Rubber Co., Ltd., recently received a letter addressed, "Dunlop extra heavy fit this side first, Transvaal," that was posted in Mozambique. The address was evidently copied from the side of a Dunlop motor cycle cover.

Death of Mr. Harvey du Cros.

Mr. William Harvey du Cros, the founder of the pneumatic tyre industry, died on December 21st at his residence, Dalkey, Co. Dublin. In his younger days Mr. du Cros was a noted athlete in Irish amateur circles, and with the advent of the motor car he became an enthusiastic motorist. Mr. du Cros was seventy-two years of age, and belonged to a distinguished Huguenot family which settled in Dublin early in the eighteenth century. A year or two ago he retired from active work in the Dunlop companies.

An International Touring Trial.

An excellent idea has been suggested to us by Mr. T. W. Loughborough, secretary of the Auto Cycle Union, namely, that of holding a motor cycle international touring trial in 1920. A similar idea has already been put forward in our sister journal, *The Autocar*, in which it was suggested that the trial should start in Belgium, should touch some of the most interesting places which figured in the war, and descend *via* the Vosges into the French Alps, thence into Italy and back again to France, finishing up in Paris. The idea deserves the greatest encouragement, as any scheme that will further the wonderful alliance now existing between the nations which have fought and conquered is an excellent one, and well worthy of all the support which can be given to it.

The Motor Cyclist Spy.

Now the war is over stories are coming through of the wonderful exploits of our Intelligence Corps. It was the custom of our High Command, when they were anxious to obtain any special knowledge about the Hun military organisation (and there was not much that escaped their notice), to send a spy (usually a Frenchman who knew the country thoroughly and had a full inside knowledge of the Hun military machine) in an aeroplane behind the German lines, leave him to work there for a few days, and then actually fetch him back again by the same means.

The machine used was a specially-constructed B.E.12 type, and the pilot usually a well-known Birmingham racing motor cyclist who specialised in this particular work. It was undoubtedly a very risky commission, but he was brilliantly successful, and was rewarded by many military decorations.

These must have been some of the most wonderful exploits of the war. Very often the machine was hit by anti-aircraft fire, but it always managed to get back.

Popular among our Belgian Allies.

A prominent officer who has much to do with motor cycles in the Belgian Army writes: "*The Motor Cycle* reaches this depot regularly each week, and is read with the greatest interest by everybody. There is quite a scramble as to who shall read it first."

The Birmingham M.C.C.

At the inaugural meeting of the Birmingham M.C.C. held on December 20th many suggestions were put forward for the improvement of future competitions, social events, etc., and the club's 1919 programme promises to be a very attractive one. It was also suggested that the various motor cycle clubs should make a combined appeal through the A.C.U. to the authorities to have the Motor Restriction Order revoked. It was proposed that the local clubs might reopen motor cycling competitions by having an inter-club trial.

The Motor Cycle in France.

In an article entitled "*The Motor Cycle of To-morrow*," our contemporary *L'Auto* makes an urgent appeal to French manufacturers to wake up and turn out machines of the same type as those used by their English and American Allies.

The position is summarised in the following words, "If ten people in France buy uncomfortable motor bicycles without change speed gears, to start which they must be acrobats and run 100 yards, there will be 1,000 buyers who will interest themselves in the reliable complete motor cycle constructed for the practical purchaser."

The French writer's ideal is a machine of not less than $3\frac{1}{2}$ h.p., with rear springing, a good spring fork, wide mudguards, 3in. tyres—in fact, a practical English motor cycle. The flat twin is also spoken of favourably.

The article concludes by pointing out how the motor cycle can be brought up-to-date, and urging manufacturers to produce something really good. "If such a machine is built," writes our colleague, "the French will not regret it."

Outputs.

Enormous outputs are expected by several makers of motor cycles, and if rumour is not exaggerating we shall shortly see large numbers of new machines on the road.

A New Precision Engine.

The new Precision engine will be a 350 c.c. two-stroke single-cylinder engine which, we are told, will develop approximately the same h.p. as a pre-war 500 c.c. four-stroke. All revolving parts will have roller bearings, the lubrication will be automatic and continuous, and will not require a subsidiary tank for oil storage.

The Institution of Automobile Engineers.

The fourth meeting of the session of the Institution of Automobile Engineers will be held on Wednesday, January 8th, 1919, at the Royal Society of Arts, John Street, Adelphi, W.C.2, at eight o'clock, when Mr. L. H. Pomeroy will read a paper on "Influence of Valve Lift and Combustion Chamber Design on Consumption."

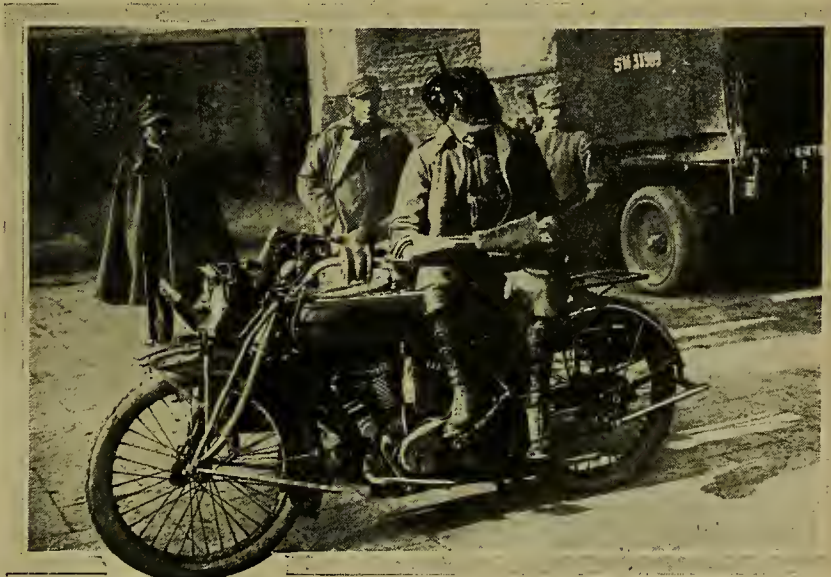
Cards of invitation to the meeting may be obtained on application to the Secretary of the Institution of Automobile Engineers, 28, Victoria Street, Westminster, S.W.1.

Kindly Appreciation.

Praise for one's work is always appreciated, and it was gratifying to receive from a well-known firm of engine specialists a warm eulogy of *The Motor Cycle's* work during the war years that are past.

They tell us that "Your constant placing before us of the hundred and one points of detail in motor matters with ever new views upon them; the comprehensive reviews of existing types, both of complete machines and parts; and the exhaustive descriptions of new developments, or possibilities of developments, have been of the utmost use to us."

This exactly sums up our aims and ambitions.



An Italian Army motor cyclist awaiting orders. A carbine, fixed on the off side by the forks, is usually carried on the outfit, which in this case is an Indian.



EMPIRE TRADE



**BRITISH MOTOR CYCLES
AND
THEIR SUITABILITY
FOR
OVERSEAS SERVICE.**



**POINTS OF POLICY
WHICH MUST
BE GIVEN ATTENTION
IN THE FUTURE.**

THE word "Reconstruction" has come to be connected with everything from the price of groceries to women's suffrage, and, in consequence, is rapidly losing its point. In this fact lies the danger that the importance of essential things may be levelled down to the value of those which are not so important, and, in the process, many things which require vigorous action may be allowed to go on along the line of least resistance.

We ask the industry to curb its impatience, to make careful preparations in changing over in order that the restart is made a sure foundation for business on better lines than before. This is not saying that we consider the average motor cycle manufacturer has been hopelessly antiquated in his methods, but there has been nothing done yet which it is not possible to improve, and "Do it better," in our opinion, should be a far preferable business motto than even "Do it now."

The present is the best opportunity the Trade is likely to have to put its house in order, and even three months' lost trade will be a price worth paying if the restart is made on "Do it better" foundations. If the change over is made hurriedly and temporary arrangements made for motor cycle output, the most may not be made of facilities, and such temporary arrangements may remain permanent.

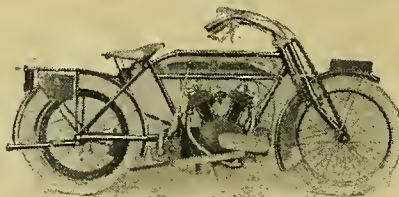
Of National Interest.

Better facilities exist for development than most firms had before the war. In the interests of the motor cycle movement, and of the nation, it behoves every maker to make the most of them. The British industry in the future may then be an important factor in the commerce that must be created if this country is to maintain its position.

That Overseas trade must be more seriously considered has long been acknowledged by the thinking men in the trade; but, in many cases, not only new methods are needed, but new models also. Too long has the British manufacturer done business with a "Take it or leave it" attitude. Fortunately, to the maker, it

has not mattered a great deal, because his output has found a ready sale in the home country. There have been some, on the other hand, who have had energetic sales managers, keen to enlarge Overseas connections, but who have not had really suitable machines to develop foreign trade. The popularity of the American machines in the Colonies is proof positive that either our methods or our models—perhaps both—have been inadequate.

It seems strange that after the makers had been deaf to the demands of the Overseas markets on such points of ground clearance, it required a buying commission from Russia (which country probably knows less about motor cycles than any other) to induce the makers to adapt their machines to "foreign" requirements. However, quite a number of "Russian" models now exist, which are more suitable for the Overseas trade generally than most machines which were produced before the war. Never before have there been so many machines with 28in. x 3in. tyres, and that ample ground clearance demanded by many Overseas buyers. The magneto, too, has been considered and placed higher, and, in some cases, accommodated at the rear of the engine. The British maker has a chance now to meet his competitors in the Overseas market.



The 6-7 h.p. Overseas, made by a firm specialising in Overseas business.

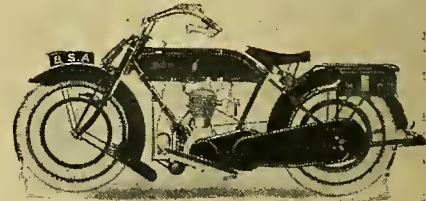
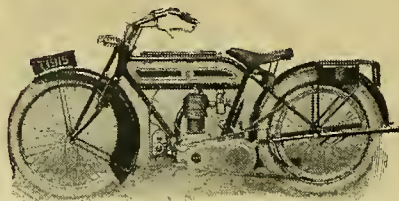
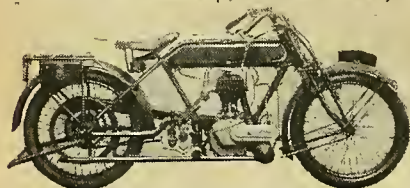
The maker must not, as in the past, resign himself to be shut out of the most profitable Overseas markets merely because the difficulties, at first sight, are too great. The line of least resistance is not the direct line to success, and if it seems impossible to do business in a certain country because of competition, there are reasons which should be thoroughly sifted. But, first of all, it is necessary to compare the goods that are being offered with those with which they are to compete. The maker who cannot learn a little from his competitors must indeed be a very egotistical man. We know that confidence in one's goods is a very fine thing, but it is just as well to see where the "other fellow" is scoring, and the reasons therefor.

Nine British machines which are the nearest approach to "Colonial" requirements British manufacturers have yet offered are illustrated on the next page.

Some English Twins.

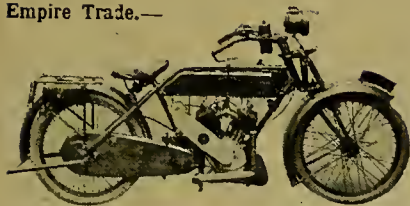
Excellent as these machines are, in most cases, they remain English models adapted for Overseas use. It is obvious that the new position for the magneto had not been considered when the machine was designed, while in a few cases the improvements consist merely of the embodiment of 28in. wheels. In fairness to the designers of these "Russian" machines, it is perhaps well to state that they were not claimed to be anything more than adaptations. The buying commissions visited this country with certain requirements clear in their minds, and to meet these requirements existing models were adapted, no time being given for special designs.

It would be unfair also to criticise British machines without mentioning the fact that the British designer has arrived at the big twin Colonial model from an entirely different direction from that along which the U.S.A. machine has developed, and in this connection, in our opinion, lies the secret of the successful



Representative British "singles" which are popular Overseas: The 4 h.p. Norton, 4 h.p. Triumph, and 4 1/2 h.p. B.S.A.

Empire Trade.—



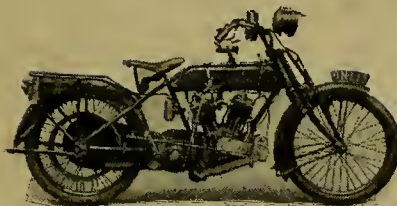
8 h.p. Sunbeam

Overseas machine. * The British big twin has been developed as a sidecar mount, while in America and Overseas the majority of machines are used solo.

That is a point the British manufacturer should bear in mind. Let him ask himself if his big twin machine is suitable for solo work. The designers of several of the Russian models illustrated here can answer, without hesitation, in the affirmative, but some there are who will, in defence, assert that their product is not designed as a solo machine. Whether it is designed for sidecar or solo work, *nine-tenths of machines used Overseas are ridden solo.*

A Suggestion.

If any manufacturer, in considering ways and means of securing Overseas trade, will make enquiries—or, better still, send out a representative to study the requirements of riders abroad—he will find that the bulk of the British machines exported have been those most



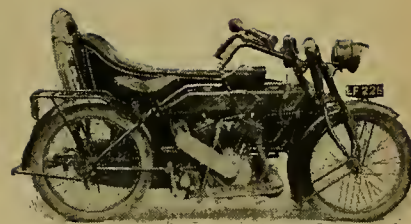
8 h.p. New Imperial.

frames, and until British makers cover every one of these points they have opposition to overcome which decreases the chances of increasing output.

Since these demands are identical with those of the home buyer, there is no reason why the British big twin should not claim its full share of Colonial trade.

Another thing which must be borne in mind. America will not be the only competitor in the future. Italy is rapidly coming to the front with motor cycles which promise to fulfil many of the requirements of the Overseas trade. France, too, is a possible entrant as a serious competitor in the future, and unless the British manufacturer makes up his mind to study the world's, instead of local, requirements, the British motor cycle industry is doomed to take a second place in the markets Overseas.

The English motor cyclist may consider that too much attention is being directed to the Overseas machine, and



8 h.p. Matchless.

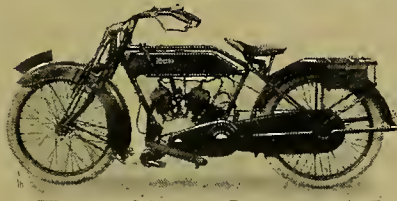
riders of their machines might readily obtain spare and replacement parts. This matter is closely allied to those other questions revolving around the financial aspect.

There appears no doubt that if the British motor cycle industry is to secure its fair share of Overseas trade, pre-war agency arrangements must be modified vastly. The Overseas buyer generally has been handicapped by being asked to pay cash for goods against documents in London, which means that an Overseas buyer, say in Tasmania, has to pay for his motor cycles before they leave England. This has compelled the majority of Colonial buyers to arrange with an exporting house in England to make financial arrangements for them. However, whether the English export house or the Colonial agent pays, the fact remains that the goods actually are paid for about two months before they arrive in the Colonies.



*The 5-6 h.p. A.J.S.

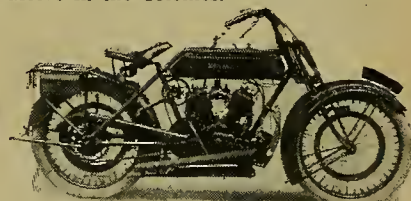
suitable for solo riding, and generally have been single-cylinder mounts with fairly good ground clearance, while great success has been earned by those having chain transmission. It must be remembered always that the Colonial rider frequently has to ford a stream, which is a difficult proposition for a belt-driven machine. American manufacturers have been singularly successful in the Overseas markets, because they have been able to offer a machine of a type developed under almost identical conditions as Colonial, and also different from anything procurable in this country. Thus it can be said that, while the American markets have had the lion's share of the twin demand, the British have monopolised the "single" market. This, of course, appears to be quite satisfactory, but the tendencies in the Overseas market point to higher power, larger diameter tyres, larger wheels, and spring



5-6 h.p. James.

that his requirements are being neglected. We think that when every point is considered it will be found that the Overseas buyer's ideal big twin is the home buyer's ideal also, and that the demand of the English solo riders for spring frames, larger tyres, chain transmission, etc., lines up with the requirements of the Overseas buyer. The results of the "Which type" referendum published in this issue reveal that the great majority of English sidecar riders require spring frames and 28×3in. wheels; in fact, there is nothing in the "home" specification which does not tend to bring the machine nearer to the Overseas ideals.

After the suitability of the machines themselves comes the important question of "service." Before the war, no arrangements were made by the majority of makers to ensure that the Overseas



8 h.p. Enfield.

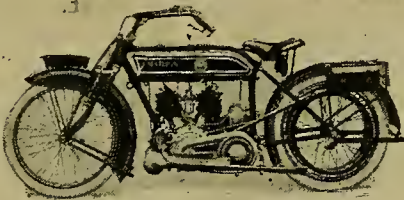
Far better would it be for the larger manufacturers to open branch establishments in Australia, Africa, New Zealand, South America, etc. Some of the American makers have such branches in Canada, Australia, and Africa, and in addition have large depots in the principal cities. It seems absurd that, while some makers consider it a necessity to open depots in large towns in England, they overlook the greater importance of doing this in the Colonies, where their branches would serve a continent.

The Problem of Distribution.

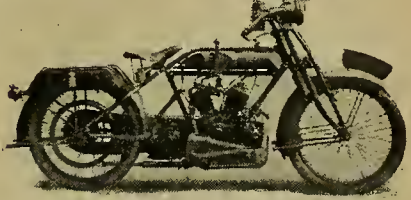
Failing this, then, several makers with goods that do not actually clash should combine to open a distributing store in each of the Colonies and other countries where a demand, existing or potential, is to be found. Such distributing stores would solve the spare parts



5-6 h.p. Rover.



6 h.p. New Hudson.



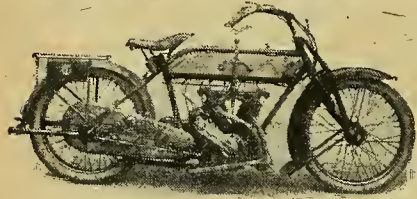
8 h.p. Royal Ruby.

Nine British twins suitable for Overseas work:

Empire Trade.—

problem, and, instead of a rider having to send to England, and, incidentally, wait several months, the delay would be reduced to days. The knowledge of this would lend confidence to the Colonial buyer of a motor cycle, who in purchasing certain machines may have hesitated.

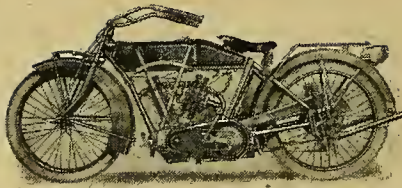
It is very frequently stated by writers on Overseas business that the American makers have the great advantage of "standardisation," which apparently is



8 h.p. Bianchi

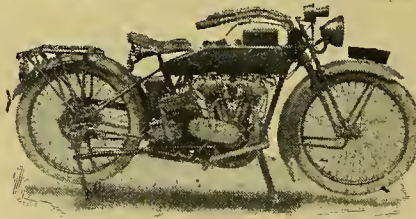
confused with the system in vogue in the American automobile world of buying and assembling units produced in quantities by specialists. To associate this system with the American motor cycle industry is wrong, whereas Great Britain has the advantage. The American industry does not include engine and gear box specialists such as the J.A.P. and Precision engine concerns and the Sturmey-Archer Gear Co.

There are only two U.S. makers catering for the Overseas market, yet they



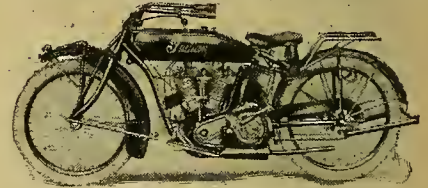
10 h.p. Pope

have a secure hold in our Colonies. This is a factor which has to be considered by British makers who aspire to the export trade. Consideration of these facts rather suggests that "too many models" is just as bad for an exporting nation as for an individual firm. Without taking this too literally, it certainly emphasises the necessity for closer co-operation between manufacturers. In this direction an "inter-standardised" Colonial model could be produced and made by a group of manufacturers, with a number of smaller engineering concerns



7-9 h.p. Harley-Davidson.

working for them, on the lines adopted by the Government in the production of aircraft. This would mean that a certain portion of the trade, instead of entering the Overseas market individually, would form a syndicate to produce and market one Colonial model. The parts would be made by them in their various factories or by smaller engineers under sub-contracts, and subjected to a system of inspection similar to the A.I.D. organisation. The central home of the syndicate would assemble the machines



7-9 h.p. Indian.

and organise the commercial side. Then it would be possible to open Colonial assembling centres also, with repair and replacements depots in all the Colonies. We think this idea is worth considering, especially by the smaller makers, who, instead of competing against their contemporaries in the matter of Overseas trade, could unite with them in concentrating that energy on the manufacture of some unit or part of a unit for the "inter-standardised" Colonial model.

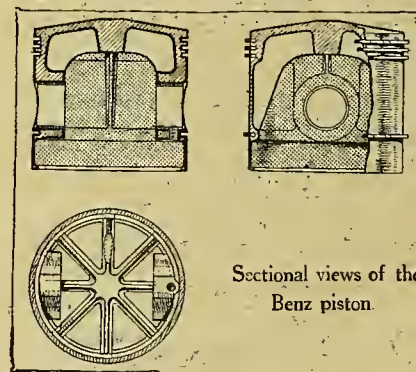
Benz Aluminium Piston used in German Aeroplane Engine.

THE original Benz aircraft engines of 160 and 230 h.p. had light cast iron pistons, in which the piston head was lightly domed and reinforced by a perforated steel cone riveted to the head, and resting with its apex on the gudgeon pin. An Aviatik biplane with 230 h.p. Benz engine was brought down this year, in which were found aluminium pistons. These were the first to be found in enemy aircraft, and were also probably the largest diameter aluminium pistons used successfully prior to that date, i.e., early in 1918.

These pistons weighed 4.53 lb. each without rings, which weighed 0.095 lb. each. The total weight of the complete piston, with rings and gudgeon pin, was 4.91 lb., as compared with the standard iron piston, which weighed 6.72 lb.

Unlike the standard Benz cast iron piston, the domed head of the aluminium

piston was supported and strengthened by eight webs radiating from a central boss in the piston crown. The formation and shape of the webs are clearly shown in



Sectional views of the Benz piston.

the drawings. The piston rings are exceptionally deep in section, being 0.21in. deep and only 0.12in. wide vertically. The gudgeon pin bosses were fitted with steel bushes 0.080in. thick. These were "cast in" the bosses in the usual way. The gudgeon pins were 1.50in. diameter, and the bosses 2.55in. diameter. The method of fixing the gudgeon pin by a hexagon-headed set-screw and the split pin is standard Benz practice.

The chemical composition of the alloy, from a metallurgical analysis, proved to be as follows: Copper, 6.02%; zinc, 12.13%; iron, 1.42%; silicon, 0.31%; tin, nil; nickel, nil; manganese, trace; magnesium, trace.

The clearance allowance corresponded to 0.005in. per inch of bore at the head end and 0.0025in. per inch of bore at the skirt.

AN OPEN LETTER TO THE TRADE.

DURING the Reconstruction Scheme, is it possible for you to build a saucer track near London, say within a sixpenny fare; and another between Coventry and Birmingham; and a third at Stockport, Newcastle, or Manchester?

It would prove a wonderful testing ground for the Midland manufacturers, and, provided sufficient "pots" were put up, some wonderful speeds could be witnessed by the "man in the street."

Where can you find better sportsmen than the British, provided, of course, you play the game?

To make certain that each rider is a "trier" with at least some chance of success a standard time should be fixed for each lap, and unless the laps were accomplished within the "schedule," then that particular rider should not be allowed to compete in any other race on the same day.

I maintain that Brooklands is too large, and, in addition, it is too far from Town to get a large "gate." So who will be the first to put up the "needful" to lay the foundation for a Saucer Reconstruction track, or shall we have to wait until the Harley-Davidson get their "Reconstruction" programme going?

Things are going to hum in motor cycle circles. So here is jolly good luck to the coming boom. W. COOPER, Lt.

The Motor Cycle and the Health of Democracy.

The Political and Social Aspects of Motor Cycling, and the Great Possibilities of the Cheap Utility Mount.



"Ixion" attacks an Old Problem in a New Way, and suggests a Means to Solve It.

IN this article I momentarily abandon—with apologies to tolerant readers—my usual semi-technical, semi-jesting vein, and don the cap of a hopelessly impractical visionary, inviting our readers to forget for a moment the sporting and engineering aspects of our common hobby, and to consider its political and social aspects. Lest I should continue in this solemn tone with strings of sonorous polysyllables, I will now ask my friend Bill Brown to address the meeting.

Bill Brown (loquiter).

"How d'ye do, gentlemen? You don't know me, so I'll explain that I look after the gas engine, dynamo, and general power and light fittings in a small pattern-making establishment in X—Street. Hours, 6 a.m. to 6 p.m. daily, with sixty minutes for dinner. Knock off Saturdays at 1 p.m. Wages, 45s. pre-war; post-war? I'll wait and see. Age, 48. Married, six kids; and I'm proud to say five of them are boys.

"Mr. 'Ixion' says the first thing I'm to do is to explain where I live and why. I live in X—Street, close to my job. You mayn't know X—Street. It was built about the year one. Looks like it. Feels like it. Doors and windowframes all warped. No bathroom. No coalhole. Front door opens straight on to the street. Back door opens straight into—well, they call it a "yard"; it's a gloomy sort of gangway between two back-to-back rows of dirty old cottages. The gangway is choked with small wash-houses and coalsheds, and—well, we keep the back door and windows shut, even at midsummer. The staircases are so steep and rotten we don't let the little 'uns go up and down them alone. Landlord won't do anything. Why won't the landlord do anything? Because he can let this hovel ten times over for seven and a tanner a week if I turn rusty and quit. High rent for such a hole? Of course it is. You see it's like this. I could get a better house three miles out on the Meadowsweet Road for 6s. a week, with a garden in front and vegetable plot behind. So could any of my neighbours. But what price coming in three miles for a 6 a.m. start six days a week? Workmen's trams, of course. I know all about them. Then the dinner hour. If I cycled out I'd get wet through twice a week, and my digestion isn't any too good; I'd sure pay for it, because I wouldn't get out there much before 12.20, and I'd have to start back with my stomach full at 12.45.

"Mr. 'Ixion' says I'm to tell you what a good time I have, and what I do with my money. Well, it just goes. I spend a bit on liquor, because it bucks a

fellow up. I put a bit on a horse most dinner hours, when there's any racing; otherwise on football. So would the Pope, if he'd as dull a week as mine. Evenings I spend in the pub. The missus is busy washing the children or the crocks or the clothes, and the kitchen isn't exactly a palm court at such times. Saturday afternoons I go to a football match, where I shout myself hoarse and catch cold. Saturday evenings, the pub. Sundays, a good lie-abed, then a pipe and the *News of the World*: later, more pub. What else is there to do? Saved much money? Didn't used to: but during the war what with bonus and no racing much, and those Government swipes we did put by quite a bit. It'll soon go now, I expect."

* * * * *

("Ixion" resumes).

Well, gentlemen, that's my friend Bill Brown's story. I don't pretend it's typical of his class: but it's fairly typical of X—Street, which is a longish street: of all the streets like X—Street, and there's a bigish block of them: and of large similar rookeries abounding in similar old-fashioned industrial towns. By the way, Bill didn't tell you that he looks more like 60 than the 48 to which he owns: that much the same might be said of Mrs. Brown: and that the Brown youngsters are rather a pallid, pasty crew, though as sharp as needles.

I think the Brown *ménage* is a blot on our civilisation. It is a C3 household, physically, mentally, morally, and spiritually, and perhaps K4 if you try to grade it in terms of real happiness. Moreover, a motor cycle is a plank in my platform for ensuring that the little Browns found A1 homes when they are big enough to put the banns up.

It is fairly clear that if the life of men like Bill is to be worth living, he wants:

(a) Shorter hours. (b) Better housing.

He will get shorter hours when he and his mates cease to restrict output.

He can get better housing on one of two conditions:

(1.) If the factory is moved. (2.) If Bill's home is moved.

Consider these alternatives. If the factory is bodily shunted out along the Meadowsweet Road, Bill will have a modern and wholesome residence somewhere near it: but, unless he chances to develop a fancy for gardening, he won't have a hobby to occupy his spare time. He will quite probably booze and gamble as he did in X—Street from sheer ennui. The other alternative is to move Bill, and let him live away from

The Motor Cycle and the Health of Democracy.—

his work (as clerks, directors, and other moneyed people invariably live away from their work). The dinner hour is the key to this problem. For health and comfort a two-hour dinner interval would be the solution: Bill could then walk or cycle to Meadowsweet Road for dinner without ruining his digestion. But Bill won't hear of a two-hour dinner interval in an eight or ten-hour day; because he values daylight evenings. (If harder work during working hours ever comes into fashion, he may get a five-hour day, when a two-hour dinner interval would not matter.) So Bill should be made more mobile. He is too old to walk or cycle. Like all other sane people, he detests trams, tubes, and suburban trains. A motor bicycle would solve the locomotion problem.

Can Bill afford a motor cycle? There are a lot of "ifs" in the answer. In 1914 thousands of artisans owned machines, priced at upwards of £35 apiece, especially in the more prosperous districts of York-

shire and Lancashire. In 1920? We do not know how much post-war wages will stand. We do not know how much post-war machines will cost. We do know, on the other hand, that there are scientific production shops in which even the charwoman gets £1 a day, which suggests that with full-steam labour and first-class brains wages can be high. We also know that it is possible to sell a 20 h.p. car f.o.r. at the factory for £77; because this has been done. If Bill had not wasted his substance on beer and betting (for which we cannot blame him), he could certainly have bought a 20 h.p. car of this kind long ago. If some producer had marketed a simple motor bicycle at the corresponding figure of, say, £20, Bill could have bought one before he got married, and added a sidecar later.

If some manufacturing genius succeeds in producing a "motor cycle for the million" at £20 or so, he will do much towards substituting an A1 population for those C3 millions the war has revealed.

Reconstruction of the Motor Cycle Industry.

Advice from a Member of the Committee of Reconstruction.

THE successful reconstruction of the motor cycle industry is not wholly dependent either upon the Government or upon the industry itself. Neither one has power to attain the desired end without the full collaboration of the other. Within the industry itself the main needs are a fuller appreciation of the advantages of co-operation in any or all of its forms and a better realisation of the economies resulting from quantity output and reduction of the number of types manufactured. If my information is at all correct, motor cycle manufacturers need not starve for lack of capital with which to develop their businesses, provided that their products, even though they have been produced on a small scale, have at least shown themselves to be of meritorious quality. The motor cycle industry has not yet quite shaken off that attitude of suspicion which characterised many British industries before the war. In this respect it might well take an example from the commercial motor vehicle manufacturers. These latter, owing to the circumstances of their war work, have been brought into very close contact with one another. This contact has engendered mutual confidence, and the whole industry now pulls together in a way that would have been impossible a few years ago. Motor cycle manufacturers have not had quite the same incentive to collaborating, but I cannot help thinking that they have failed to take the best advantage of such opportunities as have occurred. Mere common membership of a central society or association is not sufficient in itself, unless the activities of that central body are generally supported and its meetings thoroughly well attended. We all know what a nuisance committee meetings can be and how common it is to feel that, when they are over, little or nothing has been achieved. They have, however, a merit which is not always apparent, inasmuch as they bring people closer together and encourage free interchange of ideas.

The motor cycle industry must look largely to the Oversea markets, the possibilities of which are immeasurable. To succeed in these markets postulates

production on a big scale and at a strictly moderate cost. It is only when quantity output exists that the big expenditure necessary to support an efficient selling organisation throughout the whole world becomes possible.

At the same time, as I have said, all the efforts of the industry cannot suffice in themselves unless they are wholeheartedly backed up by the efforts of the Government. The industry has been thrown into a state of temporary confusion. It has lost a great deal of valuable goodwill. This was not allowed to slide away through any fault of the manufacturers, but was actually torn from them by the Government as a consequence of the necessities of war. It is, then, not a case of an unprogressive industry asking to be helped on to its feet, and claiming that the Government shall make good its deficiencies. It is rather a case of an industry from which the Government has taken something of immense value, which in common fairness must be returned before the account can be regarded as honestly closed. Putting the thing in plain English, my personal opinion is that the motor cycle industry cannot be properly reconstructed unless it be given the safeguards which would result from the imposition of a tariff applied to all machines imported from foreign countries into the British Empire for a period of not less than five years. With such a tariff on a fairly substantial scale, the industry, if properly organised, should be capable of regaining its goodwill. At the end of the period, the tariff could be reduced or removed altogether, and the industry ought then to be able to hold its own. The proposal is not, therefore, an advocacy of tariff reform in its ordinary sense. It is merely an advocacy of emergency legislation to meet a purely artificial state of affairs, which really amounts to a serious handicap imposed on British manufacturers in their endeavour to fight foreign competition. Once this handicap has been removed and the proper balance re-established, it is up to the industry to justify itself and hold its own against all and sundry.

CANTAB.

The BINKS 3 Phase, Jet Damping AUTOMATIC CARBURETTERS

The CARBURETTER YOU MUST EVENTUALLY BUY

IT GIVES results quite impossible with any other, and is used by the Champion and the Amateur alike. It is quite automatic—from dead slow to the utmost speed is got by the simple movement of one lever. It gives a perfectly marvellous tick over, a dead slow pull on top, an instant easy start, and utmost power; all the worries and annoyances of other carburetters are absent on the Binks. No tap twiddling or ruinous petrol consumption; makes the machine silent and imparts a flexibility never dreamt of before.

Price 49/-

+ 50% advance

COMPLETE WITH SIX SPARE
JETS, KEY, AND INSTRUCTIONS



MR. R. D. O'DONOVAN,
THE MASTER OF SPEED.

His marvellous record-breaking feats at Brooklands on his Norton startled the whole trade. He uses and advises a Binks, and says he has proved the Binks the fastest carburetter made.

Endless other events of all descriptions have been won on my carburetters, but the testimony of the two gentlemen shown above renders further examples unnecessary, they are both good men for you to copy.

10,000 unsolicited testimonials received from the nobility and gentry the world over.

Ladies and Gentlemen—The superiority of my carburetters is so obvious that it is with confidence that I advise you to get one on a month's trial, and I believe that you will get an amount of pleasure out of your machine you never anticipated before.

C. BINKS, Ltd., Phoenix Works, ECCLES

Address me personally on important matters.

In answering this advertisement it is desirable to mention "The Motor Cycle."



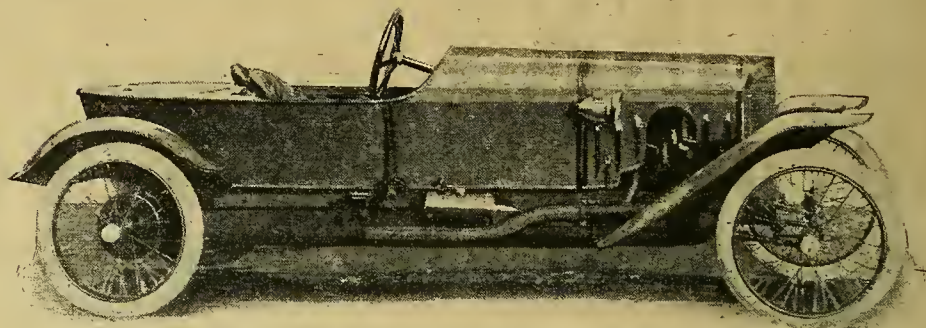
THE MANUFACTURERS' TROPHY,
won by Mr. Robbins, London to Edinburgh and back. Mr. Robbins' total errors at the controls were less than 39 secs. *Motor Cycling* says: "A truly marvellous performance."

**SENT ON ONE MONTH'S
APPROVAL TRIAL ON THE
TERMS STATED IN MY LIST,
WHICH PLEASE WRITE FOR
ALSO TESTIMONIAL BOOK
AND TREATISE ON CAR-
BURATION, FREE.**



MR. A. C. ROBBINS,
THE MASTER OF RELIABILITY,

Winner of the much coveted Manufacturers' Trophy, the blue ribbon of events. He used a Binks because he proved after trials that it was the best carburetter that was obtainable.



VITESSE

The "G.N." owes its Reputation for Performance and Service to the following features:

SIMPLICITY—The keynote of the "G.N." is its lightness, obtained not by cutting down the weight and strength of essential parts, but by effective simplicity of design and the use of high-grade materials.

ACCESSIBILITY—Both engine and chassis have been so designed that every detail is completely accessible and all adjustments can be effected with the least possible trouble and without dismantling.

EASE OF OPERATION AND CONTROL—The "G N." Cycle Car is easier to handle and more responsive than either car or sidecar combination; owing to its low centre of gravity, correctly disposed weight and effective system of springing, it is steadier on corners and holds the road well at all speeds.

RELIABILITY—Apart from lightness, the great point obtained by simplicity in design and absence of intricate parts is reliability, and

experience both before and during the War has proved the "G.N." to be dependable under severe conditions of service and over great mileages

LIVELINESS AND SPEED—The "G.N." possesses liveliness to an unusual extent, due to its light weight and high-efficiency engine. It possesses a reserve of power under all conditions, and especially scores on hills.

RUNNING COST AND MAINTENANCE—*Petrol Consumption* is very low; the average 55 m.p.g., but mileages considerably higher are frequently obtained. The "G.N." is extremely *light on tyres*—a set of standard tyres will do, on an average, well over 8,000 miles, a point of interest when compared with the tyre wear of a motor cycle. Necessary *replacement of parts* are few, and when required, quite inexpensive. More important still, owing to the extreme accessibility, the time and cost involved in fitting



FUTURE

DEMANDS.

The
New Model Combination
v. The Light Car.

By H. Tapley-Soper,

Author of
"Dartmoor as a Touring Ground."

THE recent turn of events on the battlefield permits us to think again of our old sport without that shadow which has overclouded such thoughts during the past four years. From time to time we have been wont, when in the company of fellow Knights of the Road, to refer to the happy days to come, but such expressions have gradually been losing the true ring of conviction. Now, however, all is changed, and we can, with the gentleman in Punch, exclaim, "What abaht it?" to which the cryptic reply, "What abaht what?" will be quite sufficient.

What the Public Wants.

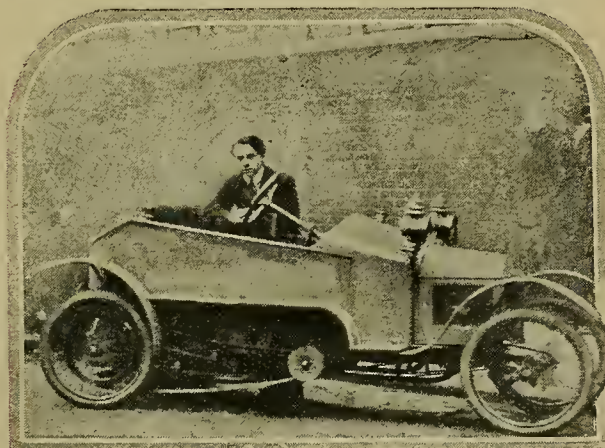
The only thing that now matters is the new mount, so what about it? What does the manufacturer propose to do for us? The concentrated experience of the past four years should enable him to produce something incomparably superior to the makeshifts of pre-war days. He starts practically with a clean slate and a fair field, the world's markets before him, and a *clientèle* with an appetite which requires no whetting. But we, the purchasers, shall differ in one important respect—we shall be much more exacting, more critical, perhaps in some cases hypercritical. The fact is we now know something about machines. Our experience of various makes enables us to recall the salient points of each design, and we are able to appreciate the pre-eminent feature of this or that make—the gear box of one, the transmission of another, the accessibility of a third, and so on. And what is the corollary? It is as simple and natural as a milliner's display to a woman—we want all the good things.

But we want them all in a single machine. The firm which can produce such a machine is going to approach the ideal and grasp the market. Individual fads which do not increase efficiency, such as round tanks, and sidecars with *retroussé* noses, will not count. Reliability, accessibility, efficiency, and standardisation are the points which will score. The Ford car has proved it. The motor bicycle must follow.

Immediately prior to the war the cult of the sidecar combination was rapidly increasing. Initial cost and subsequent upkeep had a lot to do with it, and will be a more important factor in the immediate future. Enthusiasm for the light car was certainly on the wane, at any rate amongst those of moderate incomes. A valiant attempt had been made by designers and manufacturers to produce a light car which in the matter of price was intended to compete with the sidecar outfit. The consequence was the appearance of a number of inefficient contrivances which did their producers no credit and gave their purchasers endless trouble and anxiety. The small car costing from £200 to £300 is another proposition, and does not concern the man who only has from £70 to £120 to spend.

The Pros and Cons.

At the first blush, especially to the inexperienced, a small car is generally a more pleasing proposition than a motor bicycle combination. "It affords greater protection from the elements," "It is more comfortable," "is more 'classy,'" etc., are the favourite arguments of the tyro. For a man who must face all weathers, and whose appearance is a matter of



(Left) The author and his £100 sidecar outfit, and a £100 cycle car (on right). Some interesting and original points in favour of the sidecar are put forward by Mr. Tapley-Soper.

Future Demands.—

prime import, the first point can at once be conceded. As regards comfort, many men, with only just a dash of the sportsman in their composition, prefer the exhilaration of the saddle to the "too old at forty" feeling associated with lounging in a car—either large or small, the latter often so narrow that it affords less comfort than the saddle of a well-sprung bicycle. As for the passenger, all the ladies, including several well over sixty, whom I have driven declare their preference for the well-appointed and comfortable modern sidecar. The man of experience in these matters knows that a *reliable* light car in pre-war days cost anything from £50 to £100 more than a combination, and unless he bought a certain American make, well known for the funny stories which cling to it like barnacles to a ship's bottom, he purchased an unknown quantity: a contrivance which was neither fish, fowl, nor good red-herring—generally an attempt to produce a brougham at the price of a perambulator. Whereas the motor bicycle and sidecar market offered for a much smaller sum the choice of several vehicles, backed by the experience of output, the knowledge gained by exacting trials, and the testimony of thousands of riders. Further, such combinations are faster, cost less to run, carry a better guarantee, and, instead of being in the experimental stage or in the lowest grade of their category, both as regards quality and efficiency, are easily pre-eminent in their class and of known reliability and practically fixed design. In fact, a motor cycle combination scores every time over a cheap four-wheeler except on the one point already mentioned.

The chances of getting wet and dirty on a modern combination are nothing compared with what they were a few years ago. Improved mudguarding design and the evolution of suitable and easily donned overalls have practically eliminated these discomforts, and seeing that nine-tenths of the riding done is for health or pleasure—not because one has to do it—mud baths and rain douches can generally be avoided by putting the ride off until to-morrow night or next Sunday, which is a *practice as common to the light car owner as to the motor cyclist*. Personally I would as soon ride through a rainy day, well protected by proper overalls and rubber boots, on the saddle of a motor cycle as under a fusty hood behind a steamed screen through which it is often difficult to see the road. I remember one friend at least with

whom I have done many a mile through Dartmoor mist and fogs who could never be prevailed upon to use the hood of his car except as a concession to the fair sex. In fact, there is a good deal to be said in favour of the country on a wet day. The fragrant perfume of wet vegetation, the subdued chirp of the small birds, and the impressive stillness, followed by the coming to life of the countryside when the rain ceases, provides a welcome change to continual sun and clear skies.

Army Life.

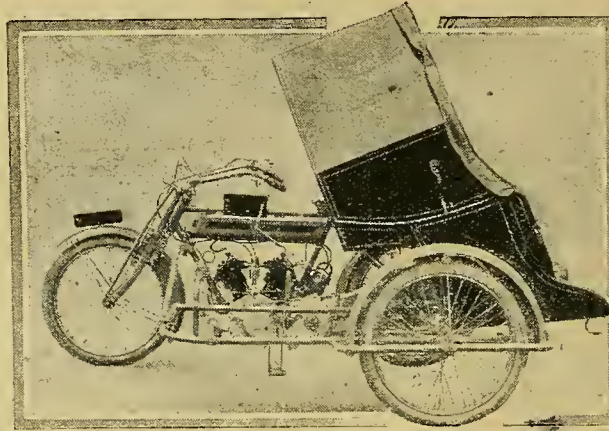
So much for the relative values of the cheap light car and the first-class motor cycle combination. Now let us consider the riders of the next few years and their requirements. What demands is the effect of Army life likely to create? Certainly there will be a much greater appreciation of fresh air and outdoor life. There will be less fear of getting in a mess

—the horrors of greasy hands or a taste of petrol will not be so real. The use of tools will be approached with less reluctance; the ability to shift for one's self will have become almost second nature, and the power to "do things" and escape from the conventions of pre-war days will be greater than ever. Military life will have added many to the army of men who take a pride in their knowledge of motor cycles and who are able to appreciate the countryside.

What of the Lady Rider?

The influx to our ranks of the emancipated lady rider, from the W.A.A.C.'s and the W.R.E.N.'s, will, I venture to think, be considerable. Not only will she take more freely to the solo machine in the company of the male friend, but they will also want to drive the husband's mount. And why should not a couple of girls jointly own and manage a fully-equipped outfit? Then there is the large number of maimed men, particularly those deprived of a leg, to whom the motor cycle will be a godsend. And what of the munitionier who has saved a hundred or so? All these classes will augment the ranks of the "open air" brigade. It is therefore the manufacturers' duty to recruit them by producing

a machine which will combine the utmost comfort for both rider and passenger—a machine that will not engender the "anxious" feeling of possible breakdowns owing to silly little troubles which the uninitiated are unable to locate. Such a machine must be of the "foolproof" variety—efficient and robust, and without frills. The initial outlay must be



The tip-up Clyno sidecar. This, from the writer's point of view, is a desirable feature.



Transmission on the "off side" is a boon on sidecar combinations, and all adjustable parts should be accessible from that side.

Future Demands.—

reasonable, and the upkeep as low as possible. To meet these requirements it should be turned out in large numbers and its parts should be standardised.

The Family Sidecar.

The design of the solo motor cycle I will leave to the young "bloods"—perhaps there is not much room for improvement. But I should like to say a few words about the heavy combination—the machine that will be demanded by the family man, who was in many cases the solo rider of pre-war days. You know the sort of outfit I mean—a machine that will easily carry in comfort such loads as we were accustomed to see pull up at seaside or moorland resorts. 'Pa on the saddle, the sporty nipper on the carrier, and 'ma and the youngest squeezed into an inadequate sidecar with the lunch and the spares. The mere fact that such loads *could* be dragged about suggests that it ought to be possible to design a combination that would accomplish such feats with some degree of comfort.

I remember on one occasion seeing a double-seated sidecar attached to, I think, a Chater-Lea which to some extent fulfilled these requirements. I followed it for some miles across Dartmoor, and, although it was heavily laden with three passengers and much luggage, it appeared to be well up to the job. This is the class of machine that I think should be developed to meet the requirements of the man of moderate means. It should have at least an 8 h.p. engine, flat or V (I will not presume to say electric lighting and starter); a strongly-built roomy sidecar with an ample grid for luggage, and a carefully-designed carrier, that neither rattles nor rubs a hole through the tin for the spare supply of petrol. The carrier should be provided with a detachable chair-like fixture, equipped with apron, etc., as a protection against dust and rain, for an extra juvenile passenger.

Some Important Necessities.

The wheels should all be interchangeable, and a spare should be provided. The practice of cocking the latter up at the back, or between the car and the bicycle like the flywheel of a steam-roller, should be abolished. A locker might be designed for it under the sidecar, or a "well" provided at the back of the body under that portion over which the hood folds back when not in use. Of course both sidecar and bicycle should be well sprung, and should be designed as a *single unit*. The man who buys a high-powered combination seldom goes to the trouble of detaching his machine just for the pleasure of indulging in a solitary "blind." The sidecar should also embody that excellent "tip-up" feature of the Clyno combination. Such a design permits of easy access to the rear side of the machine without standing on one's head or flattening one's avoirdupois across the sidecar.

Reminiscence of this uncomfortable position reminds me of another suggestion, viz., that the driving chains should most certainly be on the "off," or right, side of the machine, as the rear chain is in the Sunbeam, and if possible the carburetter and magneto should also be on the off side, and in such a position that the brushes can be easily got at.

Another Sunbeam feature that is well worth adopting is an oil bath for the chains, which should

be enclosed in cast aluminium cases, which are more easily adjusted than those language-provoking contraptions made of sheet iron or old biscuit tins.

Such a combination as I have suggested would necessarily be fairly heavy—much too heavy for a woman to lift on to the stand for wheel-changing, etc. It must therefore be provided with some form of mechanical jacking apparatus for bicycle and sidecar. Now a few minor details.

Standardisation of Details.

What about carburetters? Every observant rider knows how carburation is affected by atmospheric conditions. Cannot someone design a carburetter which can be adjusted by means of a milled nut, or a thumbscrew, from the *outside*? Bowden wire, although very excellent in its way, also has a distinct weakness. That beastly little blob of solder to wit. If it tears away on the road, as I have known it to do, one is absolutely helpless unless a soldering outfit is carried and the owner possesses much knowledge and patience. Adjustments for the stretching propensities of these wires are also unsatisfactory, and if the wires rub—as they are almost bound to do on a bicycle—one's anxiety increases as strand after strand rubs through. This sometimes occurs at corners which are out of sight and are not easily noticeable. An adjustable nipple must be designed to replace the solder blob, and some form of sheath must be provided to guard against destructive friction.

Now we come to bolts and nuts. If you give a child a box of crayons, the first attempt at a picture which will be produced is sure to need the employment of each colour. Likewise the nuts on a motor bicycle. Did you ever come across such an assortment as is to be found on a motor cycle and sidecar? A friend with whom I discussed this iniquity suggested the simile of the child and the crayons, and the office boy, or apprentice, with a free hand in the nut stores.

Surely this provides a splendid opportunity for standardisation. It will, I know, necessitate a working understanding between those who make and assemble machines and the makers of accessories, but it is sure to come sooner or later, and why not now? The result would be a greatly diminished toolbag.

Easily interchangeable controls to meet the requirements of the maimed should be possible, and in this connection a feature of an early car which I once possessed might be worth incorporating. This was the inter-operation of both clutch and brake—an arrangement that has much to be said in its favour in cases of emergency. A serviceable front wheel brake, perhaps of the Lea-Francis type, will also be demanded. The front wheel brake of the past has proved little more than a subterfuge for complying with the law—the practical value was *nil*.

A combination on these lines would, of course, require a substantial car-designed countershaft gear box with at least three speeds. The mudguards should be wide and of the latest approved pattern. The saddle should be of ample proportions and easily adjustable. Optional dull or plated fittings is a desideratum.

If any firm contemplates the issue of a machine along these lines I shall be glad to become an early entrant for its delivery sheet, and can promise a list of friends who will follow suit.

An Open Letter to the Trade.

By B. H. DAVIES.

Prospects of the Future and Suggested Lines of Development.

GENTLEMEN,—Our mutual absorption in more urgent and less pleasant tasks has prevented my addressing you in this fashion for some years past. To-day my first business must be to congratulate you on the versatility with which you threw your energies into novel channels when half the world went mad four and a half years ago, and on the extraordinary efficiency with which you blossomed forth upon an astounded universe as so many super-Krüppts. I know you astonished us, and I rather suspect you astonished yourselves. We are proud of you.

In the second place, I assure you of your old customers' patience and sympathy in the very formidable task of switching over from munition work to motor cycle manufacture. These are trying days for that section of you which men call Labour, and I daresay that even Capital does not feel wholly comfortable. Excess profits can make a hole in all but the most opulent balance sheet. Ancient prestiges and goodwill require consolidating after a moratorium of so many years. Mushroom firms are casting covetous eyes on your old entrenchments. The cost of material and the wages of labour touch fabulous heights. Men say prices must sink, but one can conceive that they may not. In the meantime, the middle classes who formerly consumed your wares are not too prosperous. I can understand that some of you do not feel too sure of your markets. Nevertheless, there will always be a bright future for good motor cycles. In the old days British motor cycles were the best in the world bar none. In the new days they will be better than ever, because we have out-designed and out-manufactured most of our cleverest rivals in munition work, and if the greater task was within your powers, you will not fail in the lesser. Believe me, you need not worry.

Rejuvenation.

You makers are probably most concerned at the moment with the relations of Capital and Labour. Queer doctrines are certainly abroad, and frank co-operation is impossible so long as greed and suspicion are prevalent on both sides. During the last four and a half years all classes have been fighting shoulder to shoulder against a common foe, and have brought out of the battle a deeper sympathy for each other's points of view. Many a member of what an old friend of mine persists in describing as the "parasite" class can now picture what life in a slum tenement on 25s. per week can imply, or what an ever hovering spectre of unemployment means, or what ten or twelve hours per day in bad air and a frightful racket are like. Many a quondam Bolshevik has a new comprehension of the fact that brains and initiative and technical skill are not universal attributes, and require their peculiar stimuli. We all believe that when the soldiers flood

the factories we shall build up a new spirit of sympathy and mutual comprehension, and that greed and suspicion may dwindle and disappear.

And now we come to speak of our more technical expectations. It is good to know that the industry is to be rejuvenated by a certain amount of new blood. I remember some years ago meeting a shrewd friend outside the Press View at Olympia. "What's the Show like?" I enquired. "Forty copies of the X—, and a dozen opium dreams by half-baked engineering students," was his terse summary. Quite a libel upon you, I grant, but with a grain of fact in it, like so many libels. Well, what do we hope for from our caterers, old and new?

Reduce both Weight and Cost.

Comfort, in the first place. Quite frankly, we have no further use for boneshakers. Many of us will carry the relics of shell shock or gas gangrene or a shattered bone to the grave with us. But that's hardly the point. Even in 1914 one or two firms had proved that a motor cycle, being a one-tracker, can be made *more* comfortable than any car. In the future, uncomfortable machines have no chance outside the very cheapest class.

Cleanliness is another item on *our* waiting list. We quite admit that no brilliancy of design can keep a fast machine clean on dirty roads. But we think quite an ordinary brain could make a machine keep cleaner than some of them did in 1914, and we are perfectly certain that the job of removing dust, mud, grease, and burnt oil need not take a tenth as long as it used to take. You all know that up to 1914 you could tell a novice because his machine was kept clean: the old hands had far too much sense to attempt the impossible. At the same time we hated going about in a filthy condition. It is up to you to remove this reproach.

Light weight is a cherished ideal with many of us. We read of aeroplanes which carry more than the equivalent of their own weight at 100 m.p.h., and of aero engines which weigh less than 2 lb. per horsepower. We find it difficult to believe that a motor cycle must either weigh considerably more than its rider, or else be jiggety and unreliable. Please give us a comfortable, staunch, all-purpose machine at 150 lb. as soon as ever you can. The girls, the elderly men, and the disabled soldiers want it badly.

It is daring to mention price in days like these. Let us hope that the wiseacres who prophesy a sixty per cent. drop in costs during the next three years are right, and that all you have learnt about costing and production during the war will be valuable in peace. For there is an urgent demand for a Ford motor bicycle. The working man wants it. The middle-aged working man has not got a single outdoor hobby

An Open Letter to the Trade.—

of a sporting kind. The majority of the middle classes will want it, for they have been impoverished. The ex-Second Lieutenant will want it. In the R.A.F. alone there are 30,000 youngsters, who have grown accustomed to life on £400 a year, and thousands of them will not earn more than £200 for many a long year when they are demobilised. If Ford can make a 20 h.p. car to sell at less than £80 f.o.r. Detroit, what can you make a simple bicycle for?

I know that some of you burnt your fingers over cycle cars in the premature booms of the past. You look at the scars occasionally, and say the sidecar is good enough. In any case, those classes who will never again have as much "spence" as they used to have, are looking for something between a light car and a motor cycle.

What of the Overseas Trade?

Various correspondents urge me to press a variety of suggestions upon you. Our old friend the unpuncturable tyre crops up again: and certainly a puncture on a motor bicycle is far worse than it is on a car. The enclosed and integral speedometer drive—you should be able to contrive this? Listing a completely equipped machine, if only as an option? Cannot you guess how annoying it is to spend the first delirious week of ownership in buying umpteen accessories to make a machine ready for the road, and then to learn from subsequent experience that half the stuff you have bought is intrinsically dud or hopelessly unsuited to your own particular machine? Nickel plating, embossed letters on crank cases, oil drips which do not drip—those, of course, are mere memories of a hideous past.

A little wail comes to me from Overseas. "We showed we were patriots in the war. We died for you by the thousand in Gallipoli and elsewhere. From start to finish most of the Colonial troops were 'storm' divisions. After the war, will the trade give us the same attention that a customer in Brixton can rely

on? We do not want to buy American goods, but if British firms do not curse us and support Overseas agencies, what are we to do?" I think that letter can only have one answer, gentlemen.

Kick-starters and Mechanical Oiling.

We are watching eagerly to see whether you have solved the problem of electric lighting for solo mounts. It is the brightest and cleanest light we know, and we appreciated it highly on the best 1914 passenger outfits. Of course, it is dear, and we cannot all afford it. But we hope you can supply it, and if you include lugs and a drive on all machines, those of us who can't buy it immediately will save up and have it later.

Lubrication? No, we are not lazy. But there are two jobs in relation to motor cycling which we all hate, because they demand labour without intelligence. One is mending the tyres, and the other is graduating an invisible oil supply. We have no use for peering at an invisible drip to see when the next pumpful of oil is due. Car engines attend to their own lubrication, our engines should do the same.

The Prime Essentials.

Please don't jump to the conclusion that we are returning to our old hobby in a carping spirit. If you read this letter twice—which, of course, you won't—it will dawn on you that it is a stupendous piece of camouflaged panegyric. How so? Well, what are the two prime essentials of a tophole 'bus?

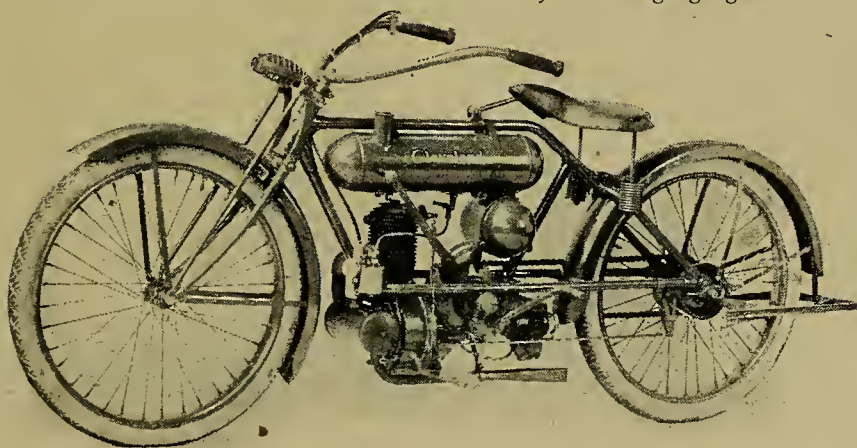
1. Reliability.
2. Speed.

I haven't said a word about either of them because you've long ago given us full measure of both,

pressed down and running over. All we ask now is best described in khaki slang: we plead for a little more "spit and polish," a few better gadgets—non-essentials all of them, but serving to perfect the finest pastime in the world.

Yours in gratitude, respect, and hope,

B. H. DAVIES.

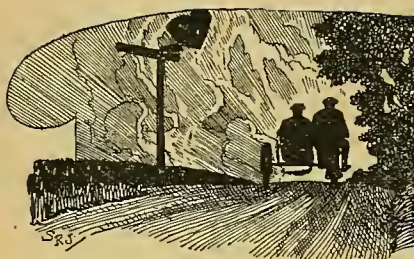


The 1919 Cleveland two-stroke lightweight—one of the few two-strokes produced in America. This is a "new" view of the machine, and reveals many details which hitherto have been obscure.

THE FREE USE OF PETROL.

IT is announced by the Board of Trade that the Motor Spirit Restriction Order, the operation of which has been suspended until January 10th, will be revoked entirely from that date. Licences to obtain motor fuel still remain in force, but the Petrol Control Department are prepared to issue new licences and to increase the quantity allocated to existing licence holders.

The action of the Board of Trade, though tardy, is none the less welcome. It is generally felt that the Motor Spirit Restriction Order might have been suspended as soon as hostilities ceased, while it was always thought that the thirty-mile radius concession was somewhat absurd, as it would have been impossible to have enforced it. It is understood that all reasonable requirements will now be met.



Rolls-Royce and Ford Models.

Extremes of the Future Market.

ALL sorts of changes have been predicted with regard to the motor cycle of the future, but, viewing the outlook both from the points of view of riders and manufacturers, there is no particular reason to think that the old order, as regards the variety of machines produced, will be in any way restricted. The best known of our manufacturers will proceed to follow their own sweet wills as hitherto, though stimulated, perhaps, by keener competition, but one change is certain—that we shall arrive at greater extremes than in the past. We shall have the Rolls-Royce among motor cycles and the Ford—the first-named being a machine produced for the “select few,” and the latter, rendered not only possible but certain by the many changes that have taken place in the manufacturing world, the necessity for increasing output and finding adequate employment for our huge factories, etc., produced for the multitude.

The Rolls-Royce.

Recently I have conversed with manufacturers who are enthusiastic upon concentrating on this model—the luxury solo mount. One of them outlined his plans to me. His idea is to produce a really hot stuff flat twin, which is to possess every possible refinement in the way of modern equipment, etc.—mechanical lubrication, electric lighting, and a standard of finish which will place it in a class to itself. No expense is to be spared in order to obtain the zenith of comfort, tractability, speed, and durability, and the price of the finished article will most assuredly debar it from anything but a very select market. This price, however, is to include a first-rate system of service and a very generous guarantee—though the latter will automatically become void should the owner attach a sidecar! You buy the machine, if in difficulties you wire for a mechanic—indeed, the Rolls-Royce system is to be followed throughout within reasonable limits—but if you attach a sidecar you become an outlaw, beyond the pale of sympathy and support!

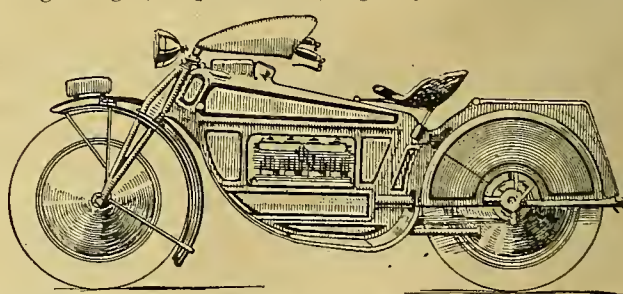
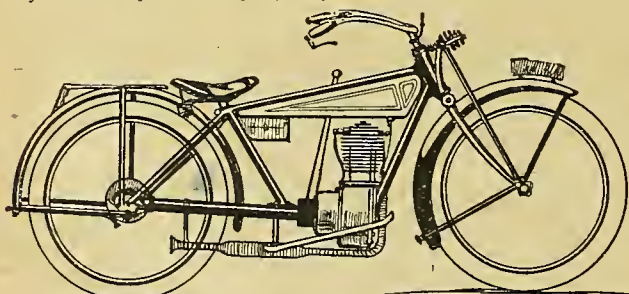
When I expressed the opinion that, attractive though the scheme appeared, the price was apt to kill the whole thing, I was assured that, provided the machine was positively paramount and exclusive as regards quality, there would be no doubt as to a market. Take it to Oxford or Cambridge and ask £120 for it, and there would be men ready to buy so long as they were getting the very best that could be produced. With the initial purchase the expense would cease, and, durability being one of the main points, one would be assured of a good second-hand price. There is no doubt a good deal in this argument, as there are unquestionably many motor cyclists who are not particular to thirty pounds either way so long as they get what is notoriously the best, and if we have the Ford motor cycle this somewhat snobbish spirit will be strengthened among the silver spoon gentry.

I know another manufacturer who intends concentrating on a four-cylinder luxury model which will be presented at a somewhat exclusive price, but the bulk of our makers rightly contemplate producing mounts of “medium” quality at medium prices.

The Quantity-produced Machine.

A certainty within the next five years, it is difficult to prophesy as to what form the Ford of motor cycles will take. One is inclined to think there will be some competition in this line, and that more than one type will make its *début*. But whatever c.c. may be chosen, the Ford motor cycle, like the Ford car, must have something more than cheapness to recommend it. It must be handy, reliable, and foolproof, these features being infinitely more necessary here than in the more costly type, because scores of fools will buy it. Like the Ford car, it must be capable of enduring neglect and hard usage—suitable for commercial requirements and all-weather riding.

There is an immense demand for an ultra-cheap lightweight, capable of going anywhere at its own



“Chinook’s” ideas of a quantity-produced model of the Ford type and a super de luxe model on Rolls-Royce lines. The cheap proposition (on left) is a single-cylinder, two-stroke, shaft drive, two-speed, flywheel magneto, and the simplest frame construction. There are no limits to the scope for elaborate finish on the aristocratic type, but it is difficult to get beyond the best accepted constructional details.

Rolls-Royce and Ford Models.—

speed, and, above all things, cheap to run. Hundreds of working men are waiting for it, though not prepared to take the plunge till it has actually established itself. An equal demand exists for the ultra-cheap delivery machine—suitable for commercial delivery and for the requirements of working men who desire to take their families afield.

One might suggest the two-stroke as the goods for the lightweight—a two-stroke of ultra-simplicity, having an all-chain drive and an inexpensive selective clutch gear on the lines of the Enfield. Produced in quantity it could be turned out at an absurdly low figure. The engine should be self-oiling on the lines of the Velocette, and the petrol consumption must be low. It should be capable of 150 m.p.g. at normal speeds, and should leave the factory fully equipped with all accessories for the road—brazen lugs being provided for all accessories—horn, lamps, etc. Petrol and oil piping should be cut down to a minimum, and one would suggest the integral unit system, the gear being contained in the crank casing, pinion driven, so that only one chain will be employed. If this can be cut out and a final shaft used, so much the better, the whole transmission then being oiled from the engine, so that the rider will have nothing to do but fill up with oil and petrol and look after his cycle parts.

The Commercial Machine.

This should not be less than 700 c.c. Apart from its commercial value, many would buy such a machine in preference to the lightweight if it were suitable for solo riding. It should be suitable, but whereas a three-speed gear would be essential for commercial requirements, this might be cut out advantageously for solo riding—a good countershaft clutch, Indian fashion, taking the place of the gear. This would render the machine lighter and cheaper, and it would be by no means difficult to produce a design which would permit the use of the gear box or clutch at will, the two machines being identical except that one would be a three-speed model and the other merely a clutch model. Personally, I have great faith in the clutch model solo mount, and it is to be borne in mind

that the machine for the multitude will be of the low compression, low volumetric efficiency type, capable of pulling hard at low speeds.

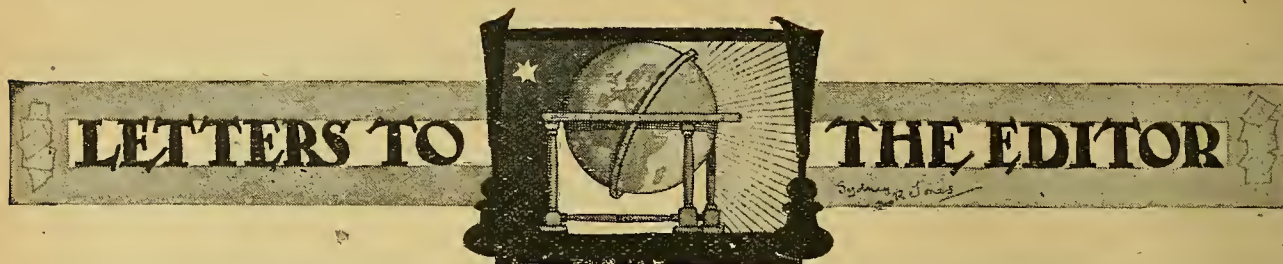
Where the Money goes.

Where the money goes at the present time is in minor fittings. It is not difficult to turn out engines under the quantity system, and the same applies to frames, sprockets, chains, etc. The price of carburettors, saddles, etc., is absurdly high, and something simpler and less costly must be arrived at. Similarly, the minor accessories run away with the money. Tot up what it costs to rig a machine with lamps, horn, tools, spares, etc. Magnetos are bound to be costly, but there is every hope of British quantity production in this line. It is cheaper for the manufacturer to buy accessories than it is for the private owner, and there are many advantages to be derived from this system. The manufacturer can choose accessories, all of which are in keeping with the machine, of proper size and weight, for many riders appear to possess no judgment whatever in these matters. Similarly, if the manufacturer chooses the accessories he can make proper provision for their permanent anchorage, so that the rider will no longer be troubled by a horn which insists on slopping round the bars and a lamp that vibrates its lens loose.

These are but a few points which strike one when viewing the problems of the future. It is to be hoped that we shall see a general tendency in the direction of rigidity and simplicity with quantity production. Is it not time the old pedal cycle ideas of mudguarding were finally abandoned in favour of shields—not only on account of their inefficiency, but because cycle mudguards rattle loose and afford a thousand points for the settlement of mud and rust? Much thought and good brains will be necessary if the Ford motor cycle is to appear in that stage of permanency which will warrant its lasting success, for manufacture of this kind does not permit of annual changes and "improvements"—those little annual additions "for next year's catalogue" for which we have all paid through the nose. It must be five years ahead of its time—if not someone will be badly stung. CHINOOK.



The popularity of permanent camps in the country with those who work in cities has of late years been increasing with leaps and bounds. In the future, when the motor cycle becomes the machine of the masses, these summer homes will be found in large numbers several miles from the towns, and the health of the workers will in consequence be greatly improved.



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Herford Street, Coventry, and must be accompanied by the writer's name and address.

TAXATION.

Sir,—I am glad the question of unequal taxation of motors is being taken up by you, and I hope your efforts will be pursued until success is obtained.

The simplest and most satisfactory way to overcome the trouble would be, in the opinion of hundreds of motorists with whom I have discussed this subject, to put the whole of the tax on the fuel. In this way, the heavier the machine and the oftener it was used the greater would be the tax.

Taking a 12-16 h.p. car, for example, an extra tax of about 4d. per gallon would still admit of such a car running upwards of 3,000 miles without exceeding the present £4 4s. tax. Whereas a man who only used his car on Saturday afternoons or Mondays could keep his tax within £1.

SWIFT.

WHY NOT A PEDAL ACCELERATOR?

Sir,—I should like to make a suggestion through the medium of your most interesting and instructive columns, viz., Why not fit a pedal type accelerator in addition to the ordinary hand-controlled throttle? I am sure this would be invaluable in traffic, as the hand throttle could be set to give a steady "tick over" when the machine is stationary, combined with instant acceleration when required, and continual "tap twiddling" to avoid stopping done away with.

This would, of course, apply chiefly to sidecar outfits and to drivers who do not object to using their feet in lieu of their hands for the control of the machine, and the pedal could be arranged on the same side as the foot brake, therefore automatically decelerating when the machine is required to be stopped.

W. R. FRANCIES.

STANDARD SPEEDOMETER DRIVE.

Sir,—Now that the motor industry is being reconstructed, it would seem the right time seriously to consider the question of driving the speedometer mileage recorder or revolution indicator by means of a special shaft. This would be a permanent attachment, and not subject to the ailments from which all speedometer drives suffer more or less. The flexible cable could be attached direct to this standard shaft, and all that could possibly give way is the flexible cable itself. The life of this cable is, of course, in proportion to its speed; or, I should say, in inverse proportion to its speed—the slower it travels the longer it lasts. I would propose that the flexible cable should not under any circumstances run at a higher rate than 550 revolutions per mile. On Government aeroplanes, use is made of a gear box to reduce the speed of the flexible cable to one-quarter that of the screw or propeller speed, the latter running at 1,800 revolutions per minute; thus the flexible cable runs at 450 r.p.m. The speed of the flexible cable should be borne in mind by the designer; and the method of attachment of the flexible shaft, as well as its outer covering, deserves to be made a standard throughout the trade, so that private owners can choose what speedometer they like, and move it from one car to another or change it for another make of speedometer without any trouble.

I will at this stage make no suggestion about the method of attachment, but would propose that the motor industry consider the questions above referred to, with the idea of agreeing to a standard fitting; and, if agreeable to the trade, I shall be glad to design a method of attachment. If there is already such an attachment on the market, I do not think that speedometer makers will be likely to object to utilising it; but it should be a simple one, and a strong, permanent fitting.

B. BONNIKEN.

THINKING IMPERIALLY.

Sir,—We sympathise with your contributor "M.T., Subaltern," who gave his opinions on the suitability of British motor cycles for Colonial use in your issue of December 12th.

We have no hesitation in agreeing with him. The average British motor cycle is built to suit British conditions, which are by no means the same as Colonial conditions. The makers of the Blackburne motor cycle fully recognise the necessity of giving Overseas riders what they want, and to meet their requirements have designed a real Colonial model—not a British model altered in a few details, but a motor cycle designed first, last, and all the way through as a Colonial would desire it.

The machine is not an idea, but an accomplished fact, and it has been under test for some considerable time. We question if any motor cycle built for British conditions could follow our Colonial model over what we term our Colonial testing track. We question if any Colonial would ever find it necessary in the course of his usual trips to cross such country as that over which our Colonial model has been tested out, and if "M.T., Subaltern," cares to give us a call we shall be delighted to take him over the course.

We have thought imperially, and can promise Colonial riders something of much more use to them than our sympathy.

BURNEY AND BLACKBURNE, LTD.

Tongham, Surrey.

FLAT TWINS.

Sir,—Your contributor "Ixion" has always, in my opinion, been a little humorous and inclined to the sarcastic in his many comments which have appeared in your columns, and having read his notes in your issue of December 19th respecting flat twins, I must say he is trying to be more humorous and sarcastic than ever.

I should like to say a few words in the hope of broadening his views, as I consider his statements have a tendency to "mar" rather than make any advancement and enthusiasm in new designs, but he should not class them all alike. I am afraid "Ixion" is writing of something very much out of date; something, I think, which will not be seen in the new inventions which have to come—that being the poor lubrication of flat twin engines. When he warns readers not to buy new flat twins because of the design being poor, and infers that the front piston will be seized up, whilst the rear tappets emit greenish fountains of oil, he only advertises the fact that he is entirely out of touch with some of the scientifically constructed engines that will shortly appear.

May I whisper in "Ixion's" ear that I know of a certain flat twin designed on scientific principles embodying many unique features, which have never been seen before, one of which is lubrication by pressure to all bearings, and after a three hours' test at 2,500 r.p.m. there were only seven drams of oil in the crank case, each bearing, as well as the cylinders, etc., receiving its full share on correct mechanical principles.

Has "Ixion," I wonder, during the past two or three years been inside an aero engine factory, and noticed the magnificent workmanship and wonderful designs, which have gained for the British nation the supremacy of the air. Is he aware that many of these features will be embodied in some of the flat twins for post-war service.

It is an old tradition "the weakest must go to the wall." In the near future I feel sure "Ixion" will be greatly surprised.

HENDERSON SIDECARS.

LEONARD B. HENDERSON, A.M.I.A.E., Managing Director

THE A.B.C. MOTOR BICYCLE.

Sir,—I have read the comments concerning the A.B.C. light car and motor cycle, and would like to reassure your correspondents on the points they raise.

Concerning "E.W.B.'s" comment, I would certainly not think of allowing the engine to revolve in an anti-clockwise direction, and I regret the slip in the wording which led him to believe that in the diagram the drive is shown in forward gear. Actually the reverse gear is illustrated.

With regard to Mr. H. G. M. Hobbs's letter, I can assure him that there will be nothing in the way of "spoiling the ship for a ha'porth of tar," as he states, in any of our products, and the equipment already in view has detachable and interchangeable wheels, as well as a dynamo lighting set, but this will necessarily be an extra.

Mr. R. M. Wiggs's comments concerning straight tube frames are very much to the point and true in principle. I certainly did denounce the fetish of the straight tube frame, because it has been more of a fetish and a talking point than a point of sound technical design and reason; and one or two people may have misunderstood my meaning, as the article did not give my reasoning quite fully.

Any number of machines have made a talking point of their straight tubes, despite the fact that the frame was a four-sided figure. Straight tubes have no bending stress when, and only when, they form a perfect triangle, and a four-sided figure with straight tubes brazed into the lugs is far worse than a four-sided figure, for instance, with bent tubes, and consequently no sharp corners at the lugs.

A motor cycle is subjected to many other stresses than purely vertical ones; therefore, even a perfectly triangular frame (if it can be obtained) does not fill the bill unless it is triangulated laterally as well. In other words, to have no bending stress at all, one must have a kind of three-cornered pyramid design. Therefore, the designer can either assume that he has got a triangular frame and consequently no bending stresses, or he can assume and realise the actual truth, which is, that there are stresses in numerous directions, such as torsional ones, etc., and design his machine accordingly.

My experience has taught me over and over again that a flexible structure is a far more reliable one than a rigid structure with a sharp corner somewhere, as, of course, all the stresses are localised in this corner.

Mr. Wiggs says the straight tube frame is only a "fetish" when the members are unscientifically arranged, and this was really the whole point of my denouncing the "fetish" of the straight tube frame. I should very much like to see Mr. Wiggs substantiate his point when he states "it has been demonstrated on several occasions in the pages of *The Motor Cycle* that proper triangulation is perfectly feasible and convenient both for motor cycle and cycle car frames," by his letting me have some particulars of these demonstrations (in view of my remarks above concerning rigidity in every direction), and I would remind him that the very machine to which he refers is well known for the flexibility of the frame when cornering.

With regard to the short paragraph by "Ixion" under the heading of "A Bet," he had not the facts of the case quite as they were, neither did he complete the story.

The general arrangement drawing of the machine had been made, and the engine certainly was one that was adapted to drive dynamos previously, but it had to be modified in design in a dozen different ways in order to make it suitable for motor cycle work. The bet was to get out the detail drawings of the whole machine, and have one on the road in three weeks, and it certainly was to the extent of £100 a day. Nothing was standard on the machine; even the hubs, spindles, and cones were special, as they both combined cone brakes. The gear box required patterns and castings to be made, for which drawings were not even prepared.

There is only one frame lug similar to our previous design, and the rest were practically carved out of the solid. The tank, of course, was new, and enamelling and plating had to be done. The three-speed gear was of an entirely new pattern, running in the flywheel on roller bearings throughout, and the brakes operated on quick pitch threads.

Including drawings, patterns, castings, machining, fitting, erecting, enamelling, and plating, the whole job was done in exactly eleven days, and the machine was on the road ten days to the good (and it is still on the road).

I received Mr. T. O. M. Sopwith's cheque by the first post on the 12th day. GRANVILLE E. BRADSHAW.

A MYSTERY.

Sir,—Can anyone give me a solution of the following, which occurred whilst I was on leave recently. I have ridden a motor cycle since 1912, but confess to being completely baffled. A friend and I on a sidecar combination had had a splendid run, and on arriving at the top of a slight hill the engine started racing. As the roads were in a very wet state, owing to a heavy downpour of rain, I immediately came to the conclusion that it was belt slip. But no amount of "foot slogging" cured the trouble. So I shut off the engine. On trying to start up with a run, I found that the belt and chain to the engine sprocket were going round all right with the control lever in top notch (the machine is fitted with a Mabon variable gear), but there was no movement from the engine, and all the time the machine was being wheeled in top gear there was not the slightest movement of the engine sprocket on the magneto side, and the magneto chain was stationary. I thought that something might have given way internally, or that the key on the engine-shaft had broken. Anyway, we pushed the machine (in gear) two miles to the county town, garaged it, and went by train to our destination. On the second morning after, I returned for it. With a little difficulty I took the nut and spring washer off the engine-shaft with a view to examining the key, and on rising from my cramped position accidentally fell against the machine, causing it to move a few inches, when hey, presto! the engine started to "sigh" as the piston rose on the exhaust stroke. That was good enough for me, and after wheeling the vehicle up and down the garage for a while to make sure that I was not deceived, hastily replaced the spring washer and nut, and got on the road. I did the remaining twenty-six miles non-stop (except once to change the plug) in just under an hour and a half in spite of a terrific wind against me all the way. I do not think I have left anything out which might form a clue, and if someone will clear up the "mystery" for me I shall be grateful.

A. CALDWELL DALTON.

MAKERS AND PROMPT SERVICE.

Sir,—More than five weeks ago I sent a broken valve and guide to one of the largest motor cycle engine makers in the country, and, to avoid any possible chance of mistake, I sent also the unbroken valve and guide as patterns. I also enclosed full particulars and stamped envelope for reply as to amount of remittance.

After waiting a week I again wrote, explaining the vital need of my machine. I then received a "permit form," which was promptly returned by express letter post.

Another week elapsed before I was furnished with a statement of cost. This was remitted, with extras for parcel express post, per registered letter.

After further considerable delay a pair of valves arrived suitable for an 8 h.p. engine (mine is a lightweight), and by separate post the next day a guide to suit the 8 h.p. valves. In the meantime the makers still retained the parts sent them as patterns, without which, even if the valves and guides sent had been of correct size, my machine could not have been used. Having returned the parts (useless to me), I have since received the parts sent as patterns with a letter stating, "Sorry for delay, but will not be able to supply 'for some time.'"

Thus, after five weeks, I am told that which should have been communicated to me at the outset, and before they raked in my money, which, by the way, seems to have been the only businesslike action of the whole transaction.

Of course, the moral is, if one requires prompt service avoid "some" makers, advertise through your journal for the parts, or deal with an outside supply firm. E.B.S.

BOOKS FOR MOTOR CYCLISTS

HINTS AND TIPS FOR MOTOR CYCLISTS.

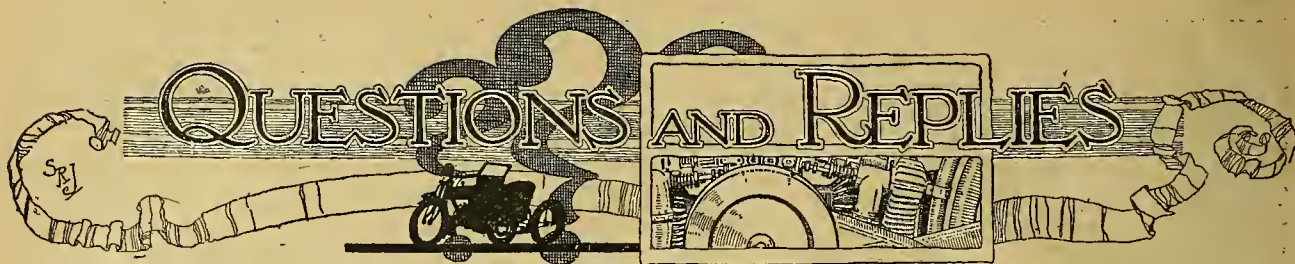
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A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C.4, and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

A Smoky Flame.

? I am engaged on work of national importance, and use a motor cycle to go to my work. I burn carbide for lighting, but get very poor light at present. The flame smokes a good deal, and soon goes out. I have tried washing it in paraffin, but get worse light than before. I have also fitted a new burner and tested the tube for leaks, but with no better results. Is there anything I can mix with the carbide or put in the water to improve the light?—F.J.C.W.

The trouble of which you speak is rather curious, and the smoky flames from the acetylene gas would lead one to suppose that the design of the burner is incorrect, and that more air is required with the gas. The velocity of the gas issuing from the burner is evidently too low—perhaps you are using too coarse a jet—but having changed your burner we are surprised that you do not get some improvement. Peroxide of hydrogen (2 to 3 ounces to each pint of soft water) is said to improve the light.

Theory of Spark Timing.

? Respecting the valve timing diagram on page 395 of *The Motor Cycle* for October 31st, will you kindly explain why the firing point is 9.2 mm. from the top of the compression stroke? It seems to me that it ought to be a shade down on the firing stroke, and not as shown in the diagram, which, in my opinion, would not allow the piston to complete the compression stroke. I have nearly all your booklets, but I cannot quite understand the theory of spark advance.—R.K.K.

The diagram is quite correct. The spark occurs before the end of the stroke in order to allow the mixture to become properly ignited by the time the piston reaches the top dead centre. You will understand that when the spark is fully advanced, the engine is turning over fairly rapidly. The time occupied by the piston in travelling the last nine millimetres is something under one-three-hundredth of a second, at the moderate engine speed of 1,000 r.p.m. The amount of advance depends largely on the phenomenon of "flame propagation," which is the rate at which the mixture burns. You will see, therefore, that if the mixture was not ignited till the top dead centre on compression, power would be lost because the piston would not receive the full benefit of the explosion.

Trouble with Sidecar Machine.

? I have a 6 h.p. motor cycle and sidecar, which I have ridden about 1,000 miles, and now it has begun playing me tricks.

After running a mile or so, it starts missing on one cylinder when pulling on top gear or going slowly on second, but seems all right when going fast. I found that the contact breaker points were too wide, and have closed them, and now with the spark retarded I do not notice it so much. Can you give me any reason for it? I have cleaned the cylinders, but find the machine has less power than it had after I had ridden it five hundred miles; the power gradually gets less. I can find no trace of leakage. Do you think the plug points are too close or too far apart? I have the Master plug, and when I take it out I can see it fire, but it does not seem to catch on when in the cylinder. It is the front one that misses. Can you also tell me why it is that when going round a slight bend in the road the outfit feels as if it will turn over, and I have to ride with the saddle high on the outside to be at all comfortable? I find the driving wheel and the sidecar wheel are exactly straight, but not level; the sidecar wheel is about a foot in front of the driving wheel. It is very uncomfortable, and I should be glad if you could give me a tip.—E.B.W.

We should advise you to try setting the plug points rather farther apart. Also make sure that there is no obstruction in the petrol supply, of air lock in tank or pipe. Apparently your sidecar is not lined up correctly, or it may be that you are unaccustomed to sidecar driving. We should advise you to obtain a copy of "Motor Cycles and How to Manage Them," 1s. 10d. post free from our publishers, Messrs. Iliffe and Sons Ltd., 20, Tudor Street, London, E.C.4.

IMPORTANT NOTICE.

GOODS MADE IN GERMANY.

The proprietors of this journal, being fully in accord with the recommendations agreed upon at the Paris Economic Conference, give notice that they will not permit the advertisements of new goods manufactured in enemy countries to appear in this publication.

ILIFFE & SONS LTD.

Two-stroke Valve Timing.

? I shall be obliged if you can tell me what is the correct fraction of each stroke, during which the inlet and exhaust ports respectively are uncovered by the piston of a two-stroke engine; in other words, the correct timing of such an engine.—R.S.T.

The port areas and timing are obtained by trial, and no definite data have been published on the subject as yet; each firm has its own design. Generally the exhaust opens at about three-fifths of the piston travel and the transfer port at four-fifths, each port being about one-fifth the stroke in depth. Some makers time their transfer ports to open at 25° crankshaft rotation after the exhaust opens. This matter is gone fully into in *The Automobile Engineer* for May and June, 1918.

Cones Working Loose.

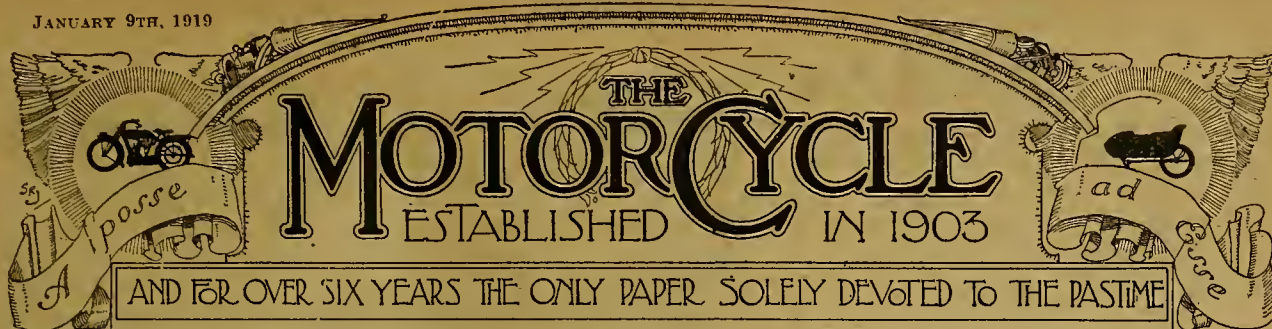
? Will you tell me why the cones which screw into the hub of the front wheel work loose and unscrew themselves? I was on the road a few days ago, and travelling at a moderate speed, when I noticed that one cone had come right out and the wheel was riding on the spindle which runs through the hub. I screwed it up again and tightened it with a hammer and punch, but after riding about five miles it came out again, so I punched it tightly again and turned back home. After a few more miles the other one on the opposite side came unscrewed, and I had to push the combination home. I have written and had a reply from the makers, but they can suggest nothing, and say they never heard of such a thing happening before. The lock nuts come unscrewed.—C.B.

The trouble is almost undoubtedly due to your not screwing up the spindle nut sufficiently tightly to grip the cone. If there is insufficient grip on the cones, washers should be inserted between the fork ends and the cones so as to enable the spindle nuts to exert pressure on the cones.

RECOMMENDED ROUTES.

FRIDAY BRIDGE TO HARROW.—G.G.

Friday Bridge, March, Chatteris, Somersham, St. Ives, Hilton, Eltisley, Waresby, Pottton, Biggleswade, Baldock, Stevenage, Welwyn, Hatfield, Potters Bar, Barnet, Finchley, Church End; here take the right-hand fork and go through Hendon, cross the Edgware Road, and then go through Kenton to Harrow-on-the-Hill.



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The Future of the Two-stroke.

THERE is no need to dwell upon the great possibilities of the two-stroke engine, which scores over the four-stroke in the three essential points of torque, simplicity, and longevity, and a more useful purpose might be served by reviewing the points on which it falls short of the four-stroke—useful because these shortcomings, or rather the prospect of their elimination, largely decide its possibilities.

We have had experience of every well-known two-stroke engine that has been placed on the road by British manufacturers, and though some are better and some worse than others, all of them possessed the same minor peculiarities to a more or less marked degree—peculiarities which, though hardly noticeable to a rider accustomed to the breed, are nevertheless sufficient to stand as stumbling-blocks in the way of its universal popularity.

First, there is the trouble of four-stroking at certain throttle openings, brought about by the present system of governing the engine by varying its volumetric efficiency. At small throttle openings, let us say, the engine four-strokes or eight-strokes; this is because the reduced charge drawn into the crank case, owing to the closing of the throttle, is insufficient for an explosion at the given mixture, and the mixture has to adjust itself during the scavenging processes ere an explosion can take place. If the throttle air be left in one position, and the speed regulated by means of a small, sensitive decompressor, no missing fire occurs, and though this system is wasteful and obviously wrong, it is, nevertheless, often the most comfortable. It would seem, then, that the whole method of governing the engine by throttling the charge between the jet and the crank case is wrong in the case of the two-stroke, and it is not unreasonable to think that some better method might be adopted. There are ways of governing the speed of an engine without varying the mixture or the volumetric efficiency—ways that

need not be wasteful if properly applied. We believe that, if some more efficient and perfect way were devised for controlling this unit, many of the peculiarities of the breed would automatically disappear, or at any rate come within range of elimination. Noise and extravagance in fuel consumption are directly connected, the irregularity of noise being the chief cause of offence in this type. Obtain an even exhaust and the problem of silencing is purely mechanical, the two-stroke engine being inherently a quieter engine than a four-stroke having the same number of explosions. The high petrol consumption, often experienced in two-strokes, is all due to the compromises that have to be struck, and most of these compromises centre round the system of control now employed.

One cannot apply four-stroke tactics to the two-stroke: let us get right away from these, realising that the engine is an entirely different breed; and having realised so much it may become clear that its peculiarities are not necessarily inherent, but rather the result of attempting to use four-stroke methods to which we had become accustomed.

The Aviation Section.

THE four-page section of this journal, which from April last to the end of 1918 was devoted to Aviation matters, has now served its purpose, which was fully set forth at the time of its introduction. Therefore, in spite of its undoubted popularity with many of our readers, we feel that the time has come when it should be discontinued. This decision has been reached with a certain amount of reluctance, but the call of purely motor cycle matters on the space at our disposal is daily becoming more and more insistent. This does not mean that flying will cease to find a place in our pages, for we shall continue to publish articles on this interesting subject at frequent intervals; in fact, we have several such articles in hand at the present time.

THE LOCAL AGENT.

Some Notes on
Agents who Justify, and
Others who do not Justify,
their Position.

ONE of the most complex questions of the motor cycle industry is the problem of the agent—a problem which, I think, will become more acute in the near future, and demand more attention than it has hitherto received.

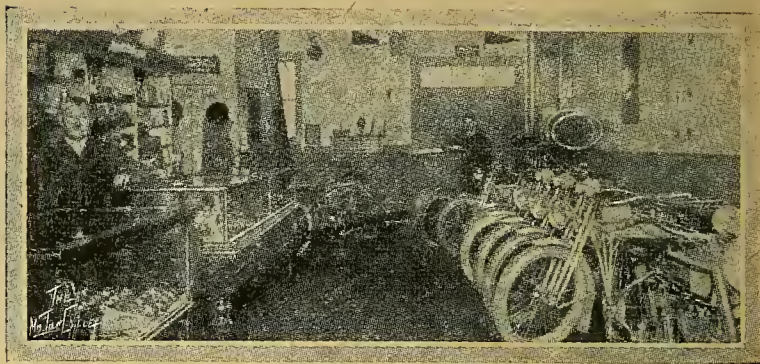
Distribution comes next in importance to the item of price, and it is indeed bound up in it very closely at the present time, when abnormal conditions of labour and material supply obtain and each acts and reacts upon the other. Up to the time of the war, the prices of new machines were in some degree compatible with the standard of living, and were in a reasonable proportion to the average earning capacity of the normal man, and the market bore a favourable proportion to the supply. The manufacturer did not trouble his head about distribution—that was generally left to the agent.

Now there are agents and agents. There is the man with a musty back street shop who sticks a machine in his window and combines the agency with the business of jobbing repairer. He has no interest in the machine he sells any more than the grocer has interest in the packet of tea he hands you. He never advertises either in the technical or local press. The machine is shown at a disadvantage, dusty, tarnished, and scratched amid tins of oil, repair outfits, and the hundred and one etceteras of the motorists' cheap-jack. He does not enhance the reputation and the dignity of the maker, and the latter does the selling, unconsciously perhaps, but nevertheless truly. When a machine is sold, that is the end of it so far as the "agent" is concerned.

Organised Business.

Is it not now a recognised fact that "service" is the keynote of successful motor cycle trading? Look, then, at the other side of the picture. This is an agency—something more than a dirty shed with "agent" in enamel letters on the unwashed windows. This is a spacious showroom in a busy thoroughfare—not very big, perhaps, but well laid out for the business for which it is intended—a light airy room, nothing over-elaborate, with perhaps a dozen machines ranged accessibly round, a courteous salesman, judicious advertising, reasonable profits, and good "after-service" leading to pleased clients: benefits to agent and maker, resulting in increased sales—*made* sales, not casual purchases.

One of the first reconstruction problems I therefore maintain, in the interests of business prestige, is the abolition of promiscuous agencies without investigation. The manufacturer must work directly hand in hand with his accredited agencies, so that "real service" may be maintained.



An example of a motor cycle dealer's shop, showing what can be done to make a finished and businesslike display in a limited space.

Another point which it is in the interests of manufacturers to take cognisance of is the dog-in-the-manger type of agency, wherein the proprietors seek to corner the local agency for the whole of the motor cycle market. They may have the sole district agency, secured on small contracts, for, say, half a dozen machines, but they do not want to sell them all. They perhaps have a good proposition in one machine, and merely hold the others, generally somewhat similar machines, so as to keep them out of the hands of other agents and preclude any competitive selling. In some cases I have known agents do this and dispose of the surplus machines to sub-agents outside their area.

Then there is the firm which grabs all the available agencies and sells on stock alone, thus it has no opportunity of pushing any particular make, and, as is the case with the majority of back street agencies mentioned before, its advertising allowance from the manufacturer is looked upon as extra discount, and treated as such.

Competition is going to be keen—all extraneous sources of leakage must be stopped, and that means the abolition of the "dabbler" who, because he includes "motor cycles" on his notepaper, claims to be a trader. The wholesaler or concessionaire, too, is a doubtful quantity. There are but few of these, but there is the tendency for the maker to endeavour to do his business through fewer channels. If direct agencies are once established on a proper footing, the need for these people will vanish. Their only hold is the fact of financial resource.

Now the policies of even our biggest motor cycle makers are not as broad and far-seeing as is desirable. Insufficient attention is given to the question of replacements and spares, and those other points which come under the heading of "service." The maintenance business must be treated as being of equal importance to the new machines, and manufacturers must altogether take a closer personal interest in their agents and their requirements. General or wide area agencies I do not advocate unless a thorough system of sub-agencies covers the whole area controlled by them.

With fixed makers' prices, it makes no difference to the user whence he obtains his machine so long as the seller is in the vicinity and can be looked to for the ready supply of replacements and any adjustments that may be required which are beyond the ability of the owner.

MASCOT.



Occasional Comments



The Spring Frame Lightweight.

IN a recent issue "Wharfedale" underlined the sensation of confidence imparted to the rider by the steadiness of a heavy mount, and described how the vibrations of a lightweight put the wind up him on rough going. I have repeatedly written in a similar strain, but I think the time has come to introduce an important modification into such statements. A rigid frame lightweight gives one the impression that its frame is eternally on the verge of fracture; but it by no means follows that a spring-framed lightweight creates this illusion. I analysed my own impressions in this respect pretty thoroughly in 1915 with the aid of a push bicycle, a rigid James two-stroke, a spring and a rigid $2\frac{3}{4}$ h.p. Douglas, a rigid $3\frac{1}{2}$ h.p. B.S.A., and a spring $3\frac{1}{2}$ h.p. A.B.C. In the endeavour to eliminate mere fancy, I reflected that I had never broken the forks or frame of a push bicycle or of any motor bicycle less than $3\frac{1}{2}$ h.p.; and so decided that my sensations of insecurity were simply due to imagination, stimulated by the jiggety progress of a stiff machine on rough roads. Contrasted rides on the mounts specified above soon proved that my nervousness was nothing but the product of imagination. All the rigid-framed machines dithered and shook me when ridden fast over bad going. Realising the vibration to which the metal was subjected, I began fancying what would happen if a tube collapsed: and the consequence was that I was always a little uncomfortable in mind when bestriding the push bicycle or any of the three rigid motor bicycles, though in sober fact there was not an atom of danger with any of them.

Spring Douglas v. Rigid Douglas.

FROM these conclusions I went on to make comparative tests of the spring and rigid frame Douglas machines. I have been a Douglas enthusiast for many years, and took the spring frame Douglas and tried it out in fast long-distance work against rigid and spring frame machines of $3\frac{1}{2}$ h.p. It emerged most triumphantly. It held the road so well that it neither tired me physically nor set the nery part of me dreaming of broken tubes. Of course it is not so fast nor so good a climber as a rigid $3\frac{1}{2}$ h.p.: but on runs where extreme speed is not desired I give it my preference against any rigid $3\frac{1}{2}$ h.p. machine. In other words, the addition of a spring frame perfects the $2\frac{3}{4}$ h.p. type for medium speed touring, in my opinion, and gives it a vanage over the rigid $3\frac{1}{2}$ h.p. class. Therefore it is but a short step forward to say that when at last we get sprung "babies," they need evince no drawbacks other than their lack of speed. The real trouble will be that spring frames are as yet so intensely ponderous. When a designer comes out with a spring frame, he usually

adds about 40 lb. to the weight of his jigger. If the engine develops 8-12 b.h.p. (as some 500 c.c. engines do), 40 lb. is a mere fleabite: but with a power unit of 200 c.c. or so, an extra 40 lb. is a real drag. In spite of the doubting Thomases, I cannot help thinking that an era of lighter metals is dawning, and that we may live to see spring-framed lightweights which will not weigh more than 120-150 lb. Subject to their limited speed range, such machines will enjoy a tremendous demand. At present we stand between the Scylla of an uncouth 2 cwt.-3 cwt. machine, which is delightful to ride but a terrible incubus to weakly owners until it is actually on the move: and the Charybdis of a 150-180 lb. machine, which is docile in the garage but a veritable instrument of torture on really bad roads.

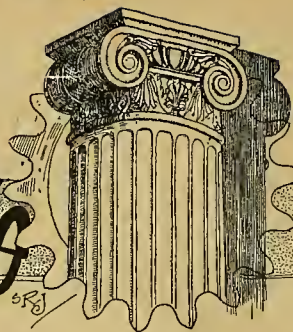
Low Speed Range.

"WHARFEDALE" evidently thinks that low speed range would kill the "babies," if their other defects were eliminated. Of course, the average pre-war motor cyclist was a husky sort of person who loved speed: and a creepy little 'bus with a maximum of 30-35 m.p.h. on the level would not satisfy him. Nevertheless, there are thousands of potential buyers for whom speed has no attraction of any kind, and thousands more for whom it is not essential. After all, "Wharfedale's" despised 20 m.p.h. lightweight is considerably faster than the push bicycle, the governess cart, the farmer's trap, and my lady's Victoria. The motor car has stiffened up the conventions of travel, but there will always be thousands of people who cannot buy motor cars. At the present moment there is a difference of over £30 between the price of a $2\frac{1}{2}$ h.p. lightweight and a $3\frac{1}{2}$ h.p. roadster, whilst the latter is so heavy that many men and women will not buy one, though they can afford it. If the trade can ever offer a genuinely comfortable and reliable lightweight at £15-£25 less than the standard roadsters of the day, the sales of that lightweight will equal the sales of the roadster. But until lightweights are comfortable, neither their handiness nor their cheapness will carry them through, for the buyers to whom they appeal set a very high value on comfort. We cannot overlook the fact that discomfort has practically slaughtered the push bicycle as an instrument of pleasure. A few years ago thousands of people went out cycling whenever the weather was propitious. Then the pot-hole and the tramline and the dust cloud came along, and the push bicycle was relegated to the status of an umbrella—a necessary evil under certain deplorable circumstances! So I say to the trade, "Make your lightweights comfortable, and they will sell, even if they never become as speedy as I have rashly ventured to prophesy!"

IXION.

▲▲▲

The Future of Surplus Government Machines.



Suggestions for their Disposal.

THERE are many motor cyclists who are inclined to think that sooner or later they will be able to make extraordinarily good bargains in the form of the purchase of surplus Government machines from among the many hundreds of thousands that are bound to come upon the market. I am afraid that these people, or at any rate the majority of them, are doomed to disappointment, but I am very strongly of the opinion that their disappointment would have been even more serious had they been able to carry out their intended programme. Probably a certain number of machines will, so to speak, leak on to the market from various sources. Among these there will be a few uncommonly good bargains. On the other hand, there will be a big percentage of "duds" hardly worth carting home. Motor cycles that have seen active service have in most cases had a very rough time. They have been subjected to stresses, the consequences of which, even if not apparent, may have been very serious. We all know that metal may be reduced by repeated shocks to a state which will, in the near future, result in a sudden fracture, though at the time no flaw is apparent or actually in existence. This is the sort of risk that must be run by the bargain hunter.

A Government Disposal Board.

As regards the great bulk of the Government machines which will presently become surplus property waiting disposal, there is not the slightest likelihood of any very extraordinary bargains eventuating. All that the motor cyclist can expect from them is reasonably good value for money. They will appeal to the man who cannot afford a new mount, but they will not appeal as being better value, but merely as being lower-priced.

The whole subject of surplus Government property has been muddled for years past. Not less than three years ago, the manufacturers concerned began to bestir themselves in order that their interests should be reasonably protected when the time came. At first the War Department talked about constituting a committee to go into the matter. This committee never eventuated. Later on, an organisation was formed under the name of the Surplus Government Property Disposal Board. This was a collection of very worthy individuals of whom only two or three at the most had any intimate knowledge of any class of motor vehicles. So far as I am aware, not one of them had any special reason to be well informed about the motor cycle trade. The Board was created by the Ministry of Reconstruction, which is itself only an Advisory Department without full power of executive action. Subsequently there was talk of transferring the Board from the Ministry of Reconstruction to the Board of

Trade. The only result of the talk was that the Disposal Board got thoroughly muddled as to whom it was and what it was for. It became apparent that, even if it succeeded in framing a report that was worth reading, there was no means of deciding whose business it was to read it. Probably there are many Government reports that are never read by anybody in authority, but it is a *sine qua non* that every report shall be addressed to somebody who is *supposed* to read it. The Surplus Government Property Disposal Board was faced with the prospect of issuing a report which would not even have an effective circulation of one, and therefore decided, with more wisdom than it had previously shown in most of its previous deliberations, not to issue a report at all.

The Interests of Manufacturers.

The manufacturers, who had been doing their best to enlighten the Board as to the gravity of the problem and the best method of solution, consequently found they had been wasting their time. They, however, were not altogether discouraged. They went on hammering, and presently the Government decided that the whole subject of the disposal of surplus property, to whatever department it might belong, should be referred finally for executive action to the Ministry of Munitions, presently to be turned into the Ministry of Supply. Having got thus far, it looks now as if things would go further without very much more delay. Unless I am altogether misinformed, a really strong committee has been going into the question, and has decided that the disposal of all classes of motor vehicles, including cycles, has got to be organised by a specially constituted branch of the Ministry. Again, unless I am misinformed, the executive of this branch will consist of people who have had every reason to study the subject carefully and even anxiously. This executive will be assisted by an advisory committee, and I should be surprised if, on that advisory committee, the interests of the manufacturers are not represented.

Goodwill.

Fortunately, in this particular case the interests of the manufacturer are not really out of line with the interests of the motor cyclist, with the exception perhaps of the speculative bargain hunter. The reason the manufacturer must certainly be considered is that his goodwill depends on the performance of the machine he has built. In fact, the goodwill of the whole British motor industry is more or less dependent upon the performance of any British machine. If thousands of British-built motor cycles went out to the Empire Overseas and strewed the roads with

The Future of Surplus Government Machines.—

broken remnants during their first few months of renewed existence, we should have hundreds of thousands of people cursing the names of the makers of those machines, and almost as vigorously cursing the name of the British industry as a whole. Now, when continuous employment for the working classes is the great problem of the day, the country cannot afford to have this kind of thing happening merely because there might be a few among the many buyers who would have reason to pat themselves on the back for having got something good for next to nothing. More consideration must be bestowed upon the inexperienced motor cyclist to whom this second-hand surplus Government machine represents his first experiment, upon which all his opinions as to the pleasures or miseries of motor cycling will be based. We do not want to kill his enthusiasm at birth, but rather to make him into a keen motor cyclist who will presently want something better than a second-hand machine.

The Question of Price.

We must consider the interests of the Government, which must, if it be sensible, try and work out some scheme which will enable it to get decent prices for its surplus goods. There is no reason why the Government should start making people presents of valuable machines. There is equally no reason why it should spoil the reputation of the stuff it wants to sell by letting a part of it go out more or less unfit for use and fall into the hands of people who will warn others against making the same mistake. Thus, the majority interest is all in favour of the adoption of some general scheme under which none of the Government machines, except a few stragglers, will be sold until they have been thoroughly overhauled by people who are interested in making them absolutely reliable. Evidently the people most interested in this are the manufacturers themselves, because their reputations are at stake. Thus, the chances are very much in favour of the Ministry of Munitions working out a plan under which all the surplus bicycles will first of all be offered to their manufacturers for repair on reasonable terms, subject to the proviso that, when they are repaired, the manufacturers will guarantee their condition. This guarantee will be worth a good deal of money. People who cannot quite trust their own judgment will be prepared to pay substantially for it. Even the man who knows all about motor bicycles will appreciate that the makers' guarantee is worth something to him, because it means that, if he has any trouble, the maker must recognise the machine as one of his own, in the performance of which he is interested. If, on the other hand, the machine had been auctioned just as it came back from the Front, the chances are that, when trouble occurred and the maker was appealed to, he would ask for the number of the machine, and, on being told it, would say that this machine had passed through experiences of which he knows nothing; had probably been inefficiently repaired, and most likely had been so altered that the regulation spare parts would not fit it. He, in fact, would be very much inclined to put all possible difficulties in the way of getting the machine repaired. At the best he would not be much interested, but would prefer to disown responsibility.

Upsetting the Sale of New Machines.

Having got the machines repaired and guaranteed, the next step for the Government will be to sell them. Here again, if the Government wants a good price, the best plan will almost certainly be to work through the manufacturer and his agents. The manufacturer will want to keep the price up to a proper mark corresponding to the value of the machine, because, if it drops too low, it will upset the sale of his new products. Thus, he will do his best to help the Government to realise the full market value of its property. This process may not be quite to the liking of the bargain hunter, but again I must repeat that the bargain hunter is not the person for whom the Government particularly wishes to cater. The general interest of the public must be considered first. The people who want second-hand machines may, if they like, wait for the Government stuff to come through. They will then get their money's worth. Meanwhile, if they can afford it, they will get their money's worth equally well by purchasing new machines. If they cannot afford new machines they will probably be just as well advised to purchase discreetly on the ordinary second-hand market if they are well enough informed to do so without serious risk. This is the whole position. It is not full of wonderful possibilities, but, unless I have gauged the chances altogether wrongly, the problem will be dealt with on safe rather than on brilliant lines, and the prices at which surplus machines will be made available will be simply those that represent ordinary market value and neither more nor less.

CANTAB.

**CUTTING THE HOLLY.**

A Matchless outfit which proved useful in obtaining the Christmas decorations.

OPINIONS

Notes on
The Past,
The Present,
and
The Future.

By Prominent
Men in the
Motor Cycle
Movement.



Second Series:

Comments of
Designers and
Others well-
known to Motor
Cyclists.

A Third Selection
Next Week.

From Mr. Granville E. Bradshaw, Designer
of the A.B.C. Motor Cycle.

THE question of reconstruction is one of vital importance to the motor cyclist, the production departments, and the designer; and, in my opinion, the motor cyclist should come first.

There is an enormous gap, stored with knowledge, between the years 1914 and 1919, and, I think, the motor cyclist should benefit by it.

The production man's idea of carrying on with improved 1914 designs for 1919 is surely a fallacy, as is also the old idea of a machine built up of additions, year by year.

To sit down for a few weeks and thoroughly thrash out the matter, using all the knowledge now available, will, I think, result in better machines, and comparatively cheaper production.

Personally, I do not intend to let the public have anything but a complete job, well balanced in all details of efficiency, design, and manufacture, a machine thoroughly tested in every way, and produced by methods that will give the rider all the value for his money that he ought to have—and I am pleased to say that this is now practically achieved.

I wish readers of *The Motor Cycle* all the pleasure possible on their new mounts, together with good roads and petrol in abundance in the year just commenced.

From Mr. Duncan Watson, Managing
Director of the Harley-Davidson Motor
Co., Ltd.

RECONSTRUCTION is paramount at the moment; it dominates political propaganda and embodies social, industrial, and commercial promise and prospect; it fills the air with speculation and foreshadows evolution that will carry us into purer elements, and breathe into our national being a spirit of more profound and generous emotion for the amelioration and up-lifting of society.

We have passed from dreams to active reality. Dawn has awakened us with dramatic suddenness, and we are rubbing our eyes and asking whether it can all be true; is it fact or mere phantasy? Everything whispers, "What of the future?" The tides echo the answer, "What you choose to make it, and you must seize opportunity while it serves."

Such is the message ringing out to every industry, hence speculate we must, whether we choose to or not, and wise is the man who can correctly forecast the future of our industry. Whether rider, agent, or manufacturer, all must contribute their respective quota towards shaping its course, and as I pen these lines the future is already taking form.

My personal view is that the direction most indicative of future success will be found along the lines of elegance, utility, and efficiency. Legislation will unquestionably play an important part, and price also will play its part. The trend of legislation will largely determine the value of the sovereign as applied to manufactured goods, whether its artificial value is to remain or rapidly gravitate towards the normal.

Standardisation and increased production will depend largely on popularity and demand for respective models. If either of these dominating factors be eliminated or abrogated, popular prices as an inducement for recruits to motor cycling will be delayed indefinitely. The survival of the fittest will be demonstrated with relentless exactitude, and efficient service will count even more than design. To that end the industry must organise to progress as it should. There are indications that the motor cycle industry for the next few years will undoubtedly boom, and manufacturers must remember that success is even more difficult to carry than adversity, and peace hath her defeats no less than war.

There is no finality in the manufacture and design of a motor cycle; nothing is now done so well as it can be done.

These facts must remain uppermost in the policy and mind of all manufacturers. The lessons of the war, unless applied, or even misapplied, may bring disasters

in peace. Let us with one accord lay these warnings to heart, and, with persistent reiteration and stimulation of our trade journals, have them constantly brought to mind—"Lest we forget."

From Mr. T. W. Blumfield, Managing
Director of Abingdon-Ecco, Ltd.

I BELIEVE it is well-known that machines which give satisfaction in this country may not be satisfactory under the more exacting conditions abroad, which must at times be appalling, and make one marvel that any machine can stand up very long.

It would appear, judging from our own correspondence and the letters which have appeared in your Correspondence columns from Colonial subscribers from time to time, that all (or some) of the following points in design must be embodied in machines for use in our Colonies:

1. Increased ground clearance. We have frequently been asked for a minimum of 7in., and one customer recently asked for a machine with a 9in. clearance.
2. Increased diameter of wheels and larger section tyres. 3in. appears to be regarded as a minimum.
3. Stronger rims and spokes.
4. Improved mud-guarding, with greatly increased clearances for tyres.
5. Frames must be sprung at the rear.
6. Longer steering heads with larger fork stems, having increased bearings, and provided with dirt-excluding devices and screwed-down grease caps for lubrication.
7. Larger twin-cylinder engines. Probably up to 1,100 or 1,200 c.c. capacity, with relatively low compression, and increased bearing surfaces everywhere.
8. Automatic lubricating system to the engine. In my opinion, the system which will eventually survive is one in which the oil is delivered from the engine oil pump through adjustable sight feeds, and not one in which the oil circulation cannot be observed from the saddle. I believe also it will be desirable to have the old reliable hand-operated oil pump as an auxiliary.
9. Detachable hubs may be regarded as desirable, perhaps, but not essential.
10. Abolition of the front rim brake.
11. Some form of positively locking the handle-bars as a preventive against twisting. All the foregoing features tend to increase weight and cost. I think a point will shortly be reached when the



Mr. Duncan Watson

Opinions.—

latter will be so high that a reaction will occur in favour of three (or four) wheel cycle cars, if not for Colonial then certainly for home use.

While there is hardly anything on the road so lively and responsive as a big twin outfit properly tuned, the sidecar combination has, I consider, serious inherent defects. In wet weather its driver becomes covered with road filth up to his knees, even on the best mudguards machines, and his condition on dry, dusty roads is nearly as bad. Special garments must be worn, and these have to be removed if one enters any house, office, or hotel, where personal appearance has to be considered.

On the three (or four) wheeler runabouts, one has much better protection from bad weather and dust. The screen, hood, and body combined enable one to drive in ordinary clothing and to keep appointments in presentable condition without stripping off filthy overalls. Further, greater comfort is obtainable, resulting from the improved seating accommodation and better springing, which has hitherto been much better than that provided on the two-wheel machines, and these advantages, I think, will surely convert many owners to three (or four) wheelers instead of two.

On the question of cost. I think a comfortable three-wheeler, at any rate, could easily be placed on the market at a price certainly not exceeding that of the more elaborate sidecar combinations.

Running and maintenance expenses will probably be rather less in the case of a three-wheeler than with the combination. I should not be surprised to see eventually single-seater three-wheelers in use by professional men, commercial travellers, etc., with just sufficient accommodation to carry a few samples (or their equivalent).

From Mr. Osborne de Lissa, of the M.A.G. Engine Co., Ltd.

THERE is, in my opinion, a fine future before the motor cycle industry, but the best machines will be more in demand, due to the increased knowledge gained by all who have had to use motor cycles on Active Service, and who have learnt that only the very best will stand up to the severe conditions imposed.

Frames and forks have caused manufacturers to put on their thinking caps, they having learnt by experience—bitter in many cases—what a machine is asked to stand under Colonial conditions when previously no amount of talking had much, if any, effect.

In this country also motor cycles will be asked to stand up to much more severe tests than in pre-war days, owing to the bad roads in many districts, and this will no doubt indirectly improve their reliability in the Colonies.

As with others, the M.A.G. engine has been still further improved, and I am



Mr. Osborne de Lissa.

hoping we shall soon be permitted to supply engines, which have given excellent results in France, Italy, and Russia, where they have been used by the military authorities of those countries.

The manufacturers of the M.A.G. have also been engaged on the production of aircraft engines, both of the fixed and rotary types, and have gained much valuable experience thereby, and, in addition to the well-known motor cycle and cycle car engines, the firm now manufacture four-cylinder automobile engines from 10 h.p. to 60 h.p., and also engines for farm tractor work.

I look forward to the reopening of Brooklands, when the future performances of the various makes may be compared with their past records.

From Mr. Jas. L. Norton, of Long Stroke Fame.

A PART from a few freak designs, I do not anticipate any serious or startling innovation in post-war motor cycle engines due to the influence of aero practice or design, the mysterious elements of which we have been hearing so much about, and the efficiency of the aero engine being purely due to the more general recognition and application of certain fundamental laws or principles, which previously the majority of designers ignored.

This latter, and the wider knowledge of metals and their treatment, with the value and necessity of accurate workmanship being more fully realised, will have the effect of raising the general efficiency average of motor cycle engines.

The extreme methods of aero engine production under the A.I.D. can never apply profitably to a commercial motor cycle proposition, although the intensive and scientific methods of production necessarily enforced upon those firms previously ignorant of such cannot but have a beneficial effect upon the industry as a whole. This will be felt in the marketing of machines of greater capacity power and economy at a smaller (proportionate) cost.

The demand for motor cycles for two or three seasons will be scarcely more than met, after which competition will undoubtedly become severe. The prosperity of the motor cycle industry will depend largely upon its workers, as indeed does the welfare of every industry. At no time in our nation's history has the need for commonsense and sane thinking among the workers been greater than to-day (thank goodness for some thinkers among them), when so many appear to be blindly following the criminal butchers who are out to kill the goose that lays the golden egg. Productiveness, which means prosperity.

Ours would be a happier and even wealthier country if Labour's slogan was "Unlimited output."



Mr. J. L. Norton.

From Mr. Georges Funck, A.M.I.A.E., the Consulting Engineer.

I BELIEVE it is the best for the user and manufacturer to follow an outline of policy on the basis of a classification. We may conveniently place the machines under two headings:

(1.) *Solo machines*, i.e., those machines used mainly for solo riding.

(2.) *Passenger machines*, i.e., those machines used mainly for carrying a passenger besides the driver.

These two main classes may each be sub-divided into two:

(1.) *Utility machine*, i.e., machine used mainly for business purposes.

(2.) *Sporting machine*, i.e., machine used mainly for pleasure riding, racing, etc.

In my opinion, the solo machine for business purposes will be the lightweight, either of the two-stroke or four-stroke type. Simplicity and reliability will be one of the first considerations. Two speeds will be required if for hilly districts. The mudguards will require more particular study by the manufacturers. No plating should be used, and a non-rusting process applied to the exposed parts, while for the nuts and bolts probably the stainless steel will be the best material. Electric lighting will be an essential part of the machine. This lightweight machine would be particularly suitable for journeys up to forty miles, while for longer journeys a slightly heavier machine up to 4 h.p. would probably meet the requirements of the majority.

With regard to the solo machine for sport, competition, etc., speed and reliability will come first, next may come appearance. In any case, the manufacturer will not be in a position to standardise so easily, as he will be asked for slight modifications, different gear ratio, etc., to suit individual requirements. Probably the day of this kind of thing has gone.

As to the passenger mount, the twin-engine machine will be in the forefront, and 5 h.p. may be considered to be the satisfactory minimum. The four-cylinder will probably be the ideal sidecar machine in combination, or with shaft drive. All machines will have to receive far more effective mud-protecting devices. With the passenger machine this defect is the more pronounced on account of the well-protected position of the passenger.

I cannot help thinking that, particularly on account of this point, the sidecar passenger combination will ultimately be replaced by a passenger machine of similar price and necessary upkeep, but affording to the driver the same protection and comfort as to the passenger. The difficulty, however, will be found not so largely in the suitable design but in the fact that the sidecarist is mostly the natural product of the solo rider, and, therefore, adheres naturally to his familiar motor cycle.



Mr. Georges Funck.

Opinions.—

From Mr. S. L. Bailey, the Douglas Exponent.

THE cataclysm overwhelming Europe has been stemmed—the greatest sacrifice of men and metal made—but the price of it is still somebody's debt. Such is the position to-day.

Reconstruction and demobilisation stare us in the face, turn which way we will. Yet, despite the past four years' training of our minds in great events, great things, and great numbers, is there one amongst us that can comprehend in their fullness the two issues before us? I fear not. Each will have to work his hardest in his own particular little sphere to attain the desired end—to make Britain worthy of the British—industrially, particularly as nationally we have attained our zenith.

We of the motor industries have a big task before us, if we wish to see that we are no worse off commercially than nationally. However, when the huge problem of munition making first confronted this

country it was the motor industries that provided the solution of the problem, and they were quick to recognise that only by immediate reconstruction could they hope to prevent the recurrence of the problem. The reconstruction of to-day is no less, and, what is more important, no greater, than the reconstruction of that day, and the world may be agreeably



Mr. S. L. Bailey

surprised—disagreeably perhaps in some parts—to find us prepared to contest a commercial warfare equalling almost the conflict that has for us so recently and victoriously ended. Motor cycle manufacturers are still aware of their positions, and are working night and day reconstructing, but they are still labouring under war time legislation. This heavily fetters them and places many obstacles in the way of progression. Once freed or even relieved in this direction, developments will proceed apace. I have hopes that the early new year will see the repealing of many of these laws, that were made to assist the industry in the making of war material, and also the making of new laws to protect the industrial life of the country.

From Capt. Geoffrey Smith, M.B.E., R.A.F., who will shortly resume Editorship of "The Motor Cycle."

WHAT of the future? That is the question of the moment. Thousands of enthusiastic motor cyclists, expectant of realising their ideal of a road-worthy machine at a reasonably low figure, impatiently watch the announcements of new models. This transition stage, during which manufacturers are hurrying to effect a change over from war work to peace time productions, is easily the most exciting period known in the history of the motor industry. Happily the outlook is of the rosiest kind. Apart from those keen riders who have tested the joys of the open road and long to renew

their pleasures a wheel, there is the vast army of converts, who, having earned fame and glory Overseas, and with a little bank balance to their credit, are ready to speculate in the most economical form of motor vehicle extant. Whatever their opinion of the reliability and usefulness of a motor cycle before going Overseas, no doubt on those scores now exists, for, under their very eyes, day in, day out, they have witnessed the ability of a motor cycle ready to go anywhere and to do anything. Our despatch riders—all credit to them—have proved missionaries in disguise. Unfortunately, cheap motor cycles are not to be—yet awhile.

Manufacturers can be relied upon to profit by their war-time experience of quantity production methods. Those lessons mean standardisation and standardisation spells low production costs, and, of course, low selling price. Design? Well, we are not all going to be satisfied with one and the same kind of machine. The more varied the selection the more interesting one's riding experience. Two strokes? Ah! their sphere is apparently still to be limited to the lightweight bicycles. In that field they will remain pre-eminent, for a two-stroke is the simplest form of bicycle motor, and the easiest to produce. A return to the 500 c.c. single would not surprise me. What better service could an engine render than the 500 c.c. singles of six years ago?

V twins? Well, the popular fallacy that a twin-cylinder engine requires double the amount of attention that a single demands is surely finally dispelled. Properly designed, with more efficient lubrication systems, and the selection of metals scientifically studied, twins (type no matter) will be the rule in the peace that is coming. But—and it is a big but—we do henceforth expect silent and durable valve gear. It is not nice to instance importations in talking of desirable improvements, but American—and Swiss—twin-cylinder engines must take the palm for the silence of their valve operating mechanism. That state of affairs should not be allowed to continue.

Aero engine experience may not be reflected in early designs so much as its effects will be apparent at Olympia, 1919. But it is in the T.T. races that all those discoveries and developments that have attained for Britain the supremacy of the air will be exploited. Unfortunately, questions of cost stand in the way, or we might see more aluminium jacketed cylinders, or steel cylinders with copper depositing on standard touring machines. Carbon still forms much too readily on most types of air-cooled engines, and leads to the objectionable habit of knocking. Correct piston design can mitigate this failing. Of the more general aspects, however, we do expect—nay, demand, to see perfect interchangeability of parts



Capt. G. Smith

when replacements become necessary, rust-proof finishes wherever possible, better design and material for valves (breakages of which should be unknown after aero engine experience), better weatherproofing, improved accessibility of parts that matter, sales and distribution methods improved, and a continued interest in a machine after it has left the factory.

From Mr. W. H. Wells, of the Hendee Manufacturing Co.

HAVING been identified with motor cycles since their very inception, I have come to the conclusion that motor cycles, in the future, will eventually resolve into two types only.

Passenger Machines.—The first and most popular type will be a high-power three-speed gear sidecar machine. This model must be designed by the makers solely with the idea of its being a passenger-carrying vehicle. The frame and forks must be constructed so as to withstand the severest amount of side strain to which a sidecar subjects them. The rider's comfort should be studied in the matter of large tyres, ample mudguards, and a reliable electric lighting system. Very few who have ever driven a sidecar combination would care to go back to the solo mount; and this applies particularly to those fairly well advanced in years.

Solo Machines.—There will always be a demand for a solo machine amongst the young and more sporty class of riders; and this machine should be so designed that it can be easily handled, light in weight, and low to medium in power. The rider's comfort need not be studied to such a great extent as with the passenger machine, particularly as gadgets add weight, which is undesirable for the solo rider. I would not recommend dynamo and battery electric lighting for the solo machine; it all adds weight, which is undesirable, and tends to make the solo machine unwieldy. I should be glad, however, to see a light, practical friction-driven generator, which would weigh less than a gas-lighting outfit, perfected for motor cycle use. A few crude types, but fairly efficient, were produced just before the war started.

Many manufacturers are too inclined to listen to more or less unpractical ideas emanating from the riding public, with the result that they find themselves loaded up with so many models that economical manufacturing becomes almost an impossibility. I think the time has now arrived when the older established manufacturers have gained enough experience to know what the public want and what is suitable for them; and by eliminating all superfluous models, and getting down to a sound, economical manufacturing basis, they can give the public better value than when they manufacture a multiplicity of models.



Mr. W. H. Wells

DELLA FERRERA MOTOR CYCLES.

Italian War Office Models to be made for the Public.

ONE of the several Italian makes of motor cycles which has been used extensively by the Italian Army during the war is the Della Ferrera, of which photographs showing two models are reproduced here. We are informed by our Milan correspondent that these machines will be made for the public this year, and that the Italian motor cycle trade—a rapidly growing industry—will make a great effort to capture the greater part of their home trade. This fact, coupled with the probable early arrival in Italy of the new American models, will make it increasingly difficult for the British manufacturer to pick up his pre-war trade,

which was very flourishing. Several new firms have announced their intention of entering the motor cycle trade and many interesting new machines, including at least two flat twins and a two-stroke, are on the tapis.

Specification.

We have from time to time illustrated many of the Italian machines, which, it may be remembered, very closely follow British lines. The Della Ferrera is no exception to this rule.

The single-cylinder Della Ferrera has a bore and stroke of 90 and 100 mm. respectively while the cylinders of the twin

are 80 x 100 mm. bore and stroke. The capacity of the former is 636 c.c. and 1,006 c.c. in case of the latter.

In all other respects the specifications of the two models are identical and include Dixie magneto, countershaft gear, four speeds, dry plate clutch, kick-starter, and internal expanding rear brake.

The gear ratios are 4, 6, 9, and 13 to 1, obtained by two pairs of chains (two from the engine to the gear box and two to the rear wheel). These are completely enclosed. The kick-starter operates directly upon the engine shaft, while in the rear wheel sprockets is embodied a shock absorber of the rubber cushion type.



The Italian Della Ferrera twin of 1,006 c.c. and single of 636 c.c.

A PRESSED STEEL FRAME.

FROM time to time we have recorded the efforts of designers and would-be designers to produce a motor cycle frame of pressed steel. So far, however, the results have not been so encouraging as the possibilities of the proposition seem to offer.

Mr. F. W. Barnes, whose name is familiar to all who follow the sport and pastime, seems to have gone beyond the "idea" stage, and has succeeded in designing a frame on these lines, which, while being entirely unorthodox so far as method of construction is concerned, is by no means unsightly.

The main or body portion of the frame is formed of two metal stampings welded on their adjacent edges. This portion is shaped at the front and rear ends to provide seatings for the two diagonal members of the frame, at the lower end of which the engine is intended to be fixed. The fore bracket is formed of a metal plate bent to form the steering

head. The rear bracket is bent around the rear end of the tank or body portion in a similar way. The front fork, too, is intended to be of pressed steel construction, while the rear stays may follow the same principles.

BOWSER SIDECARS.

MESSRS. E. BOWSER, sidecar manufacturers, 50, Park Lane, Leeds, inform us that they have only just concluded their Government contracts, and are now engaged upon making the types of sidecars which they manufactured prior to the war. Their principal production will be the original Bowser two-seated sidecar, and they are hoping in the course of a few months to be able to place on the market some new designs of two-seated and single-seated sidecars which will mark distinct progress in sidecar production.

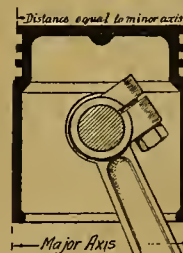
THE CHEVROLET PISTON.

AN effort to overcome piston slap and wear of pistons and cylinder walls has been made the subject of a recent patent.

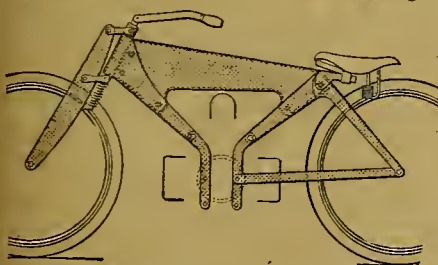
The difficulty which the invention sets out to overcome is that due to the loose fit of the ordinary piston in the cylinder when cold, so that there is a tendency for the piston to "slap" on the sides of the cylinder wall at the points at right angles to the axis of the gudgeon pin until warmed up and expanded to a good fit. The inventor's method is to make the skirt of the piston slightly oval, the largest diameter to be a good working fit

in the cylinder when cold. The upper part of the piston carrying the rings is turned rather smaller than the lesser diameter of the skirt, so is always quite free. The difference between the radii of the major and minor axes of the piston skirt is said to be quite satisfactory at .002 in.

It will be seen, that there is a permanent area of contact between the piston and the cylinder walls, and the expansion takes effect in a line with the gudgeon pin. Also the action when running cold is to distort the piston by the pressure between the gudgeon and the cylinder wall so as to increase the bearing area with the increasing pressures.



The Chevrolet piston, designed with the idea of preventing piston slap and wear on the cylinder walls.



A patented design for a pressed steel motor cycle frame.

A Two-stroke "Runabout" of Thirty Years Ago.

Some Particulars of the Butler Motor Tricycle made in 1888, which is claimed to be the First Petrol Vehicle in this Country.

IT is not generally known that a little petrol-driven tricycle was built in this country in the year 1888, and that the engine was of the two-stroke type. This was the Butler petrol cycle, of which the first design was exhibited at the Inventions Exhibition in 1885, while the provisional patent is dated 1884—thirty-four years ago.

Truly one may say that this was the first cycle car, and it is remarkable that it had electric ignition, clutch control, an epicyclic gear, and stub axle steering such as is common practice on cars to-day.

A study of Mr. Butler's pioneer machine is most interesting, and the mechanism needs very careful investigation if all its ingenuity is to be appreciated.

The method of working out the two-stroke principle is different from conventional practice to-day. From a pressure diagram before us, it is clear that a more perfect exhaust stroke is obtained than even in a four-stroke engine, while the charge is only transferred after the piston has reached the top of the stroke. The main advantages are perfect exhaust and perfect charge, so far as the working cylinder is concerned. The disadvantage of this principle would be an unduly high receiver pressure needed for the transfer.

In all it appears to be a system which, if taken up again and modernised, might give good results, particularly as regards the thermal efficiency.

The *Automobile Engineer* of March, 1916, gave the following description as provided by the inventor:

"There are two cylinders, one at each side of the driving wheel, and arranged acting away from the driving cranks, in order to work with an unusually long stroke and to have the front ends arranged as compressing pumps. The pistons are connected by rods to cross-heads, and these by return connecting rods of oval section tapered steel tubes to the cranks, which are at 180°. Each cylinder is self-contained, and draws in and compresses mixture at the front end into a pressure chamber arranged underneath, a jacket surrounding the pressure chamber being utilised to heat the mixture. The cylinders are 2½ in. diameter by 8 in. stroke, and the mixture, com-

pressed to from 15 lb. to 30 lb. per square inch, according to throttle opening, is admitted to the explosion end of the cylinders for 2½ in. of the power stroke, when it is cut off by the rotary valve and immediately ignited by a wipe contact spark, produced

by a spring point extending some 3 in. from a plug screwed into the cylinder cover." A pressure diagram, which appeared in our sister journal *The Automobile Engineer*, was produced when the motor was running at about 300 r.p.m. and with the throttle fully open. From this it was seen that the pressure was between 20 lb. and 30 lb. for the first 2 in. to 3 in. of the stroke, rising to 100-120 lb.

after the crank had moved to about 60° of the power stroke.

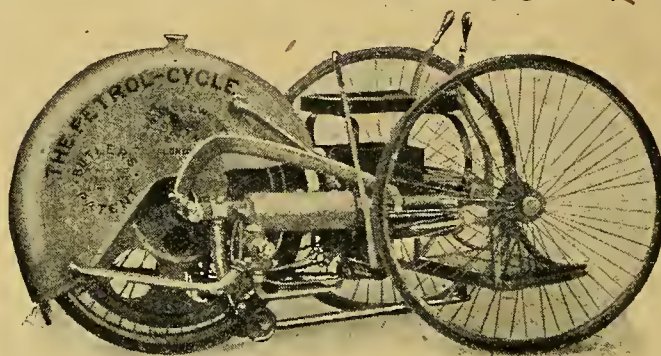
The Method of Starting.

"At each end of the cylinders there is a balanced tapered rotary valve driven at half speed by a sprocket wheel and chain. Between the rotary valves and the pressure chamber there are two plug throttles, and a third plug to control the admission of mixture from the carburetter to the compressing end of each cylinder. The purpose of the three plugs is to enable the motor to be used as a compressor while pushing it along the road for a hundred yards or so to charge up the cylinders, after which operation the plugs are moved round a few degrees to start the motor under air pressure with the driving wheel raised off the ground. Immediately on the chambers commencing to fire, the plugs are moved round to the third position to place the compressing ends into connection with the pressure chambers.

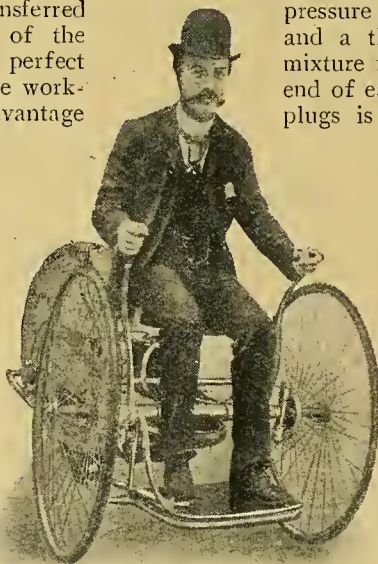
"In practice it was found that the motor would not work slowly enough to propel the car along unaided at the start, i.e., when the driving wheel was lowered to the ground, and the car had to be pushed along at a running speed until both cylinders picked up.

The motor, however, would run very satisfactorily with the driving wheel running on a pair of grooved pulleys when allowed to speed up to about 250-300 r.p.m.

"The current for the ignition was at first obtained from a dynamo magneto, but as this took up so much of the available power a primary battery was



Side view of the "Petrol Cycle," showing its curious construction.



A pioneer designer and his three-wheeled runabout of 1888.



MOTOR CYCLES

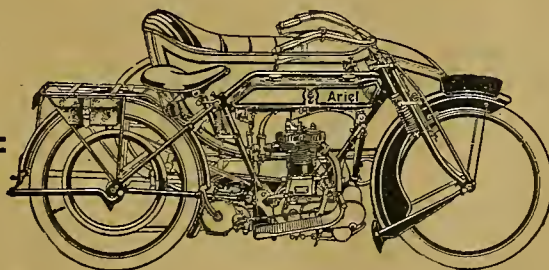
Manufacture Resumed

Orders for Ariel Motor Cycles are now being accepted for home and export delivery.

Being gradually released from our Government contracts we hope to give early delivery of Ariel $3\frac{1}{2}$ h.p. single-cylinder models.

The Ariel Catalogue may be had upon enquiry.

ARIEL WORKS Ltd., 3, BOURNBROOK, BIRMINGHAM



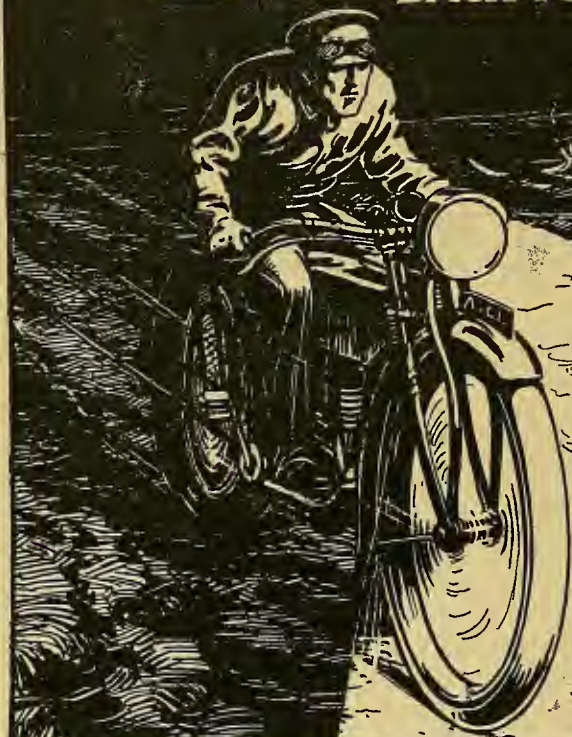
In answering this advertisement it is desirable to mention "The Motor Cycle."



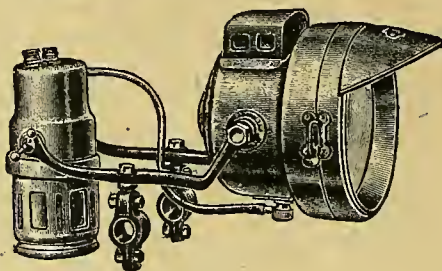
“SPEEDS”
THE DASH
BACK TO H.D.Q.

Get
Our
Motor
Cycle
ELECTRIC
SETS
on your
post war
program
-they
will be
“IT”

PH
&H
POWELL & HANMER
BIRMINGHAM



*This
is the
standard
model
as fitted*



No. 127. H.B.
price
£2-16-0 per set.

to W↑D
Motor
Cycles for
Despatch
Riders.

A Two-stroke Runabout of Thirty Years Ago.—

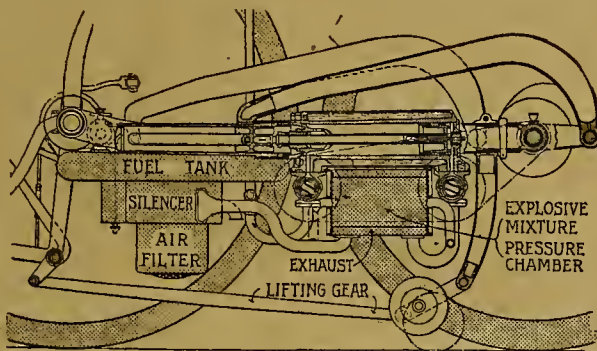
substituted. At first a Bunsen nitric acid battery was used, then a bichromate of potash, and finally a silver-carbon plate battery known as the Shancheef, really a modification of the silver-copper Smee battery. The carburetter was placed forward, just over the petrol tank, and was within reach from the seat for adjustment of the petrol feed by a pin valve; this carburetter had a jet feed and automatic air plug to maintain a constant mixture for different positions of the throttle and for varying speeds. In the trials Pratt's gasoline was used, although the motor would run on commercial benzolene, but did not start so quickly on the heavier spirit.

"After a considerable amount of experimental research with the motor arranged to work on a pressure admission two-stroke cycle this was decided to be unsatisfactory, and the motor was altered to work four-stroke, when the pressure chambers and the valves at the compressing end of the cylinders were cut out, and the valve at the explosion end altered to admit mixture at alternate forward strokes instead of at each stroke as formerly. An epicyclic transmission gear was also fitted in the hub of a new driving wheel, which now allowed

the motor to speed up to 400-500 r.p.m. when running along the road at from eight to ten miles an hour. The four-stroke motor ran much better, and after being first started by a handle on one of the cranks, with the driving wheel raised from contact with the ground, the car could be quite easily started from the seat by a foot lever at the right-hand side of the footboard. This method, although seemingly strange, really worked very well, as the driving wheel

could be let down quite gently with the toggle lever control. On the left side of the footboard was a second foot lever for the brakes on the front steering wheels. These were carried by stub axles swivelling in sockets, and were connected for the three wheels to focus to one point when steering in either direction. The cylinders were jacketed and connected by large pipes to a water tank arranged over the driving wheel, which,

although heavy, appeared to keep the cylinders from overheating. This little car, although of short wheel-base, and with wheels only 32in. and 30in. in diameter, weighed with oil and water 400 lb. After being altered from two-stroke to four-stroke, the ignition was changed from wipe spark low-tension to high-tension, with a sparking coil and rotary distributor."



Details of the two-stroke Butler engine, which embodied electric ignition and jet carburetter.

THE UNIT SYSTEM.

The Integral Engine—Gear Box and Belt Drive.

IN any design of any machine there appear to be three periods.

- (1.) The simple idea developed on crude lines.
- (2.) The fitting of various devices which experience demands as essential, but which are frequently added in a disconnected sort of way.
- (3.) The "clean sweep" of the existing details, a unification of all the essential features, and the embodiment of them in such a way as to make a design thoroughly sound.

The motor cycle at present appears to be in stage 2, particularly in regard to the transmission problem, on which depends perhaps the success of the machine. The need of the change-speed gear has given rise to a remarkably diverse development, but there has been no genuine attempt to establish a modern unit system applicable to all sizes of machines.

The all-positive system is *not* the ideal for the motor cycle, however I may be held up to ridicule by the comparison of car progress; I maintain that in a motor cycle we have an entirely different set of conditions—we have a comparatively flexible frame, and no one will contradict the opinion surely that the present positive systems of drive have to be made needlessly heavy so as to allow for errors of alignment due to the interposition of a section of this relatively flexible frame.

The unit system is a step to secure the true alignment of gears, under all conditions, of the change speed gear system. It will be agreed that the best has never been got out of the simple yet much maligned belt drive, simply because it has been put to work under conditions which in themselves damned the belt drive—the use of too big a belt reduction ratio. I want to suggest that, if the unit system be adopted, the change speed gears are placed in front of the engine and the advantage taken to give 6in. or 8in. more to the centres of the belt drive. The use of a big reduction between engine and belt pulley would allow of a large diameter pulley on the counter-shaft, and would give the belt system a new life.

The combination of the unit system with a properly designed belt drive would result in a much lighter machine per h.p., especially in the larger machines, and this is a very desirable aim to keep in view. So great a percentage of the engine h.p. in modern day practice is spent in propelling a heavy machine.

No doubt there are many who would like this problem thoroughly ventilated, and I hope manufacturers will concentrate on the unit system, with its ease and centralisation of production and its unquestioned assured reliability. In other words, we want an engineering prophet to arise who will make the clean sweep.

W. SYMES.

THE BUYERS' GUIDE.

Current Prices and Delivery Dates for 1919 Motor Cycles.

CONSIDERING that it is scarcely two months since the Armistice was signed, the trade has made remarkable progress towards re-establishing itself as a motor cycle industry. From the following schedule, it will be seen that quite a large number of makes will be available shortly. The majority of the prices given are subject to alterations as time reveals to the makers the actual cost of production. In the meantime, the rise in prices above the pre-war level is not so high as the extra cost of every other commodity from matches to wearing apparel.

No doubt the comparatively high prices of new machines will temporarily enhance the value of the second-hand motor cycle.

It is interesting to note that the Morgan Runabout and G.N. cycle car are quoted at prices competing with the de luxe sidecar combination, while the average price of 3½ h.p. three-speed machines is in the neighbourhood of £80, and the two-stroke two-speed is about £50.

The 3½ h.p. sidecar is now over £100, while 6 h.p. and 8 h.p. models range from £125 to £152. So far, the A.J.S. has the distinction of being the highest-priced motor cycle, while the Norton "big 4" leads the singles.

Space does not allow a detail review of these prices and delivery dates, but in subsequent issues we hope again to refer to these matters, which, at the present time, are of great interest to motor cyclists and potential buyers.

Make.	H.P.	Particulars in Brief.	Price.	Delivery.	Make.	H.P.	Particulars in Brief.	Price.	Delivery.
A.B.C.	3	Spring frame.	£ 70 0 0	May.	L.M.C.	3½	3-sp. countershaft gear.	£ 73 0 0	} Delivery at end of January.
A.J.S.	6	Twin, 3-speed.	106 1 0	End of January	L.M.C.	4½	Ditto.	75 0 0	
A.J.S.	6	Sidecar combination.	152 16 0	January	L.M.C.	6	Twin ditto.	86 10 0	
ALLON	2½	2-stroke, 2-speed, clutch	55 0 0	} January.	MATCHLESS	8	Combination.	140 0 0	} End of January
ALLON	2½	2-stroke, 2-speed, clutch, and kick-starter.	65 0 0		METRO-TYLER	2½	2-stroke, 2-speed	45 0 0	
ARIEL	3½	3-speed.	80 0 0	} January.	MORGAN	8	M.A.G. engine.	132 12 0	} Delivery commenced. Entire output for 1919 booked by various agents.
ARIEL	3½	Sidecar combination	106 0 0		MORGAN	8	G.P., J.A.P. engine	143 17 0	
BLACKBURNES	2½	4-stroke, 2-speed, clutch.	60 0 0	} February.	MORGAN	8	De luxe, M.A.G. (w.-c. J.A.P., £8 ss. extra).	143 17 0	
BLACKBURNES	4	3-speed.	82 0 0		NEW IMPERIAL	2½	2-stroke, 2-speed.	50 8 0	
BLACKBURNES	8	Combination.	125 0 0		NEW IMPERIAL	2½	2-stroke, 2-speed, clutch.	53 16 0	} Shortly
BRITISH EXCELSIOR	2½	2-stroke, 2-speed, kick-starter.	56 10 0		NEW IMPERIAL	8	Combination.	126 0 0	
B.S.A.	4½	All-chain drive.	81 15 0	} Orders carried out a rotation as far as possible.	NORTON	4	All-chain drive.	87 0 0	} Delivery shortly
B.S.A.	4½	Chain-cum-belt.	79 16 0		NORTON	4	T.T. countershaft, all-chain.	85 0 0	
B.S.A.	—	Sidecar	29 9 0		NORTON	3½	Single gear, B.R.S. engine.	73 0 0	
DOUGLAS	2½	W.D. Model.	60 0 0	} Delivery commenced.	NORTON	3½	Ditto, with B.S. engine.	80 0 0	} A limited number during Jan
DOUGLAS	4	W.D. Model.	75 0 0		P. & M.	3½	R.A.F. model.	78 0 0	
DOUGLAS	4	Combination.	95 0 0		P. & M.	3½	Combination.	102 0 0	
ENFIELD	2½	2-stroke, 2-speed chain-drive.	52 10 0	} It is hoped to commence delivery in January	RADCO	2½	2-stroke, single gear.	42 0 0	} Early in February (approx.)
ENFIELD	3	4-stroke, twin, 2-speed.	69 6 0		ROYAL RUBY	6 or 8	3-speed.	105 0 0	
ENFIELD	6	Combination.	115 10 0		ROYAL RUBY	2½	2-stroke single gear.	40 0 0	} Three or four weeks.
ENFIELD	8	Combination	117 12 0		SPARKBROOK	2½	2-stroke, single-speed.	46 4 0	
G.N. CYCLE CAR ..	1)	2-cyl. Standard model.	140 0 0	} Early in April.	SPARKBROOK	2½	2-stroke, 2-speed.	53 10 0	} Shortly
G.N. CYCLE CAR ..	10	2-cyl. Vitesse model.	170 0 0		SUNBEAM	3½	3-speed, all-chain.	—	
HUMBER	3½	Flat twin, 3-speed.	85 0 0	Shortly.	SUNBEAM	8	Sidecar combination	—	} Deliveries to agents commenced.
LEVIS	2½	2-stroke, single gear	38 0 0	January. Output booked until end of March.	TRIUMPH	4	W.D. Model.	85 0 0	
					TRIUMPH	2½	2-stroke, 2-speed	52 10 0	} Delivery in a few weeks.
					VELOCETTE	2½	2-stroke 2-speed.	40 0 0	
					VELOCETTE	2½	2-str., 2-sp., ladies' mod.	42 0 0	

THE 2¾ h.p. COULSON.

An Entirely New Product of Medium Power and Weight.

A NEW motor bicycle which will shortly be placed on the market is the 2¾ h.p. Coulson. This will be a mediumweight machine of medium horse-power, and one capable of going anywhere. It has been generally found that a horse-power of 2¾ is the most practical power the motorcyclist can desire. It will not give him excessive speed, but will enable a good average to be kept up and any hill to be climbed.

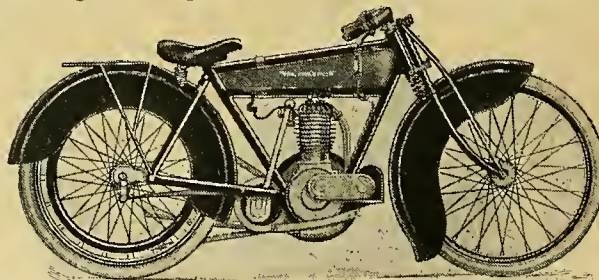
The engine fitted is a 2¾ h.p. Blackburne, 71 mm. x 78 mm., 341 c.c., which is referred to in the Burney and Blackburne programme appearing in last week's issue. This engine has the same size crank case and the same size valve as the 3½ h.p. The frame will be constructed of 1½ in. light gauge tubes, combined belt and chain transmission will be fitted, while the gear box will be a two-speed Jardine. So far as

suspension is concerned, the rear portion of the machine will be provided with leaf springing, while the front of the machine is suspended on Druid Mark II. forks.

It will be noticed that the mudguards are provided with valances of ample size, and that the top tube of the frame is of the sloping variety, and that the machine has a distinctly racy appearance. A Best and Lloyd drip feed lubricator is fitted and a Brooks saddle, the ground clearance being 4½ in.

The machine is being brought out by Mr. F. A. Coulson, formerly managing director of the Wooler Engineering Co., and it is expected that between 750 and 1,000 machines will be made during 1919. Already, half this number is booked up.

Further particulars can be obtained from the F. A. Coulson Manufacturing Co., 199, Piccadilly, London, W.1.



The new Coulson lightweight model. It is fitted with 2¾ h.p. Blackburne engine.



NEW THOUGHTS.



READERS' OPINIONS ON MATTERS OF THE MOMENT.

A Russian aviator discusses the ideal machine for Russia, and describes a "constant speed" device.
A British naval lieutenant makes a plea for better garages. The disposal of Army motor cycles.

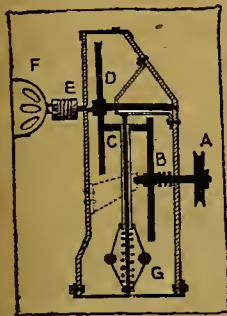
Russia's Needs.

LT. NICOLAS OLECHNOVICH, a Russian engineer and air pilot, writes to us on the requirements of the Russian market. He is at present in England, but so soon as order is restored he intends to open a motor cycle agency in Russia. Just before the war (he writes) the Russian market was fully covered by American machines, and the sale of British machines was very limited. The causes of this were (1) the conditions of the English credit system, and (2) the machines were too expensive.

In those days the only type of English machine to be seen in Russia was the lightweight, and, according to our correspondent, this kind of machine is not strong enough for Russian roads. The lieutenant also refers to the fact that the agents for British machines do not stock spare parts. If replacements were required, there has been a delay of a month or more waiting for the part to come out from England. Owing to this delay, most riders preferred to patronise the local ironworks or make the parts themselves. As a result of these drawbacks of the British machine and the handling of it as a commercial proposition, the American machines have found a larger market, because they are much cheaper, they have large engines, large tyres, and "spare parts in plenty."

A Constant Speed Device for the dynamo has been patented by Lt. Dyamo Drive. Olechnovich. According to the inventor, this invention automatically provides approximately a set speed for the dynamo irrespective of the speed of the machine. In practice, we are advised, the speed of the dynamo is approximately constant throughout the machine's range of speed from 4 to 60 m.p.h.

From the diagrammatic drawing it will be seen that the device consists of a box containing two discs, the shafts of which are parallel. Between these two discs is a friction wheel carried on a hollow shaft, which slides upon a stationary spindle. Fixed to the friction wheel sleeve is a governor of the conventional centrifugal type, by which the friction wheel is made to rise and fall according to the speed at which it revolves, and consequently alters the speed ratio between the driving and the driven discs.



A constant speed device for dynamo drive. (A.) Driving pulley. (B.) Driving disc. (C.) Intermediate friction wheel. (D.) Driven disc. (E.) Universal joint. (F.) Dynamo. (G.) Centrifugal governor

vide a machine of the following specification: Spring frame, 28x3in. tyres, high position of engine, which should be over 1,000 c.c. capacity, large tanks, and dynamo lighting set.

Overseas Finish.

LT. OLECHNOVICH is of the opinion that for Overseas machines a superior exterior finish is not necessary for every part. The Russian buyer looks only for good material, best workmanship, and, as far as possible, rustless finish. When two metals in contact are wet, a galvanic couple is set up. It is a mistake to have a layer of copper deposited on steel for nickel-plating, because the copper is a positive and the steel a negative. It is necessary to have a negative finish, such as zinc. The lieutenant thinks that future demands for motor cycles in Russia are very great, and in order to secure a share of this market British makers should provide a machine of the following specification: Spring frame, 28x3in. tyres, high position of engine, which should be over 1,000 c.c. capacity, large tanks, and dynamo lighting set.

Garages.

"G.P.G.K.," a naval lieutenant, writes on a question which should be considered more seriously than hitherto. He urges motor cyclists to "make the small garage proprietor put more method into his concern," but does not suggest how this can be done. It would appear that, in the first place, it is a matter for the R.A.C. and A.C.U. to take up, and to appoint only "men with method" as their official repairers. "G.P.G.K." writes as follows:

"Every motor cyclist knows the small garage troubles in pre-war days. Chiefly, the toolbag thief, small part thief, lack of accessories sold by the proprietor, office and store muddled together with completely drastic results, and many other minor worries.

"Now the motor cycle renaissance is coming let us make the small garage proprietor put more method into his concern.

"Official repairing signs of well-known clubs were displayed at garages which were no more than a shed for storage purposes. Let us improve pre-war motor cycling conditions."

Army Motor Cycles.

ANOTHER interesting letter is from Mr. C. S. Moores, of Bristol, who suggests that men who have served in the Army should have preference in buying war-worn machines.

The disposal of W.D. machines is a great problem, and, in all probability, a great deal of dissatisfaction will be expressed on the manner in which this matter is being handled by the Government. Mr. Moores's letter is given below:

"It was recently suggested in *The Motor Cycle* 'that men who have been riding machines should have the option of purchasing them.' This is quite in order as far as mobile units are concerned, but what about the motor cyclist who has served in the Infantry? Is not he entitled to purchase an Army motor cycle at a low price? I think the following points are worthy of consideration:

"(1.) That the sale of military motor transport be restricted to men who have served in the Forces.

"(2.) That machines be sold by auction to the highest bidder.

"(3.) That any soldier on discharge may have the option of obtaining a permit entitling him to purchase one motor cycle, car, or lorry.

"(4.) On purchasing a machine this permit to be handed to the vendors.

"Commenting on (1). This obviates the chance of big firms buying up large stocks and making 'second' profits. (2.) Enables the Government to realise a fair price for the machines the State has paid for. (3.) Men who have served in the Army are certainly entitled to any advantages the Army may offer, in preference to civilians. (4.) Ensures that every soldier is treated with equal fairness, and avoids one person being able to buy in quantity."

An Anglo-Canadian Proposition.

THE fact that the Canadian market has not been exploited by British motor cycle manufacturers is a point often discussed by Canadian riders, so many of whom have now had an opportunity of seeing the English product. We give below a short letter from a Montrealer at present in this country.

"British manufacturers," he writes, "will never realise the enormous possibilities of the Canadian market until they visit the Dominion. I feel sure that if they could but appreciate this they would make an effort to secure their full share by building machines suitable for our country and our pocket. To do this they must be made over here. Isn't there a British firm with sufficient enterprise to start a Canadian factory, or perhaps it would reduce the cost of production if the parts were made in the Home factory and assembled in Canada."

CURRENT CHAT

Times to Light Lamps.

GREENWICH TIME.			
Jan.	9th	...	4.39 p.m.
"	11th	...	4.42 "
"	13th	...	4.44 "
"	15th	...	4.47 "

Death of a Well-known Motoring Pioneer.

We regret to learn that Mr. Noel B. Kenealy has died at Nairobi, British East Africa, where he was editing a local paper. He was editor of *Motoring Illustrated* and the founder of the Herts Automobile Club.

Secretary of Road Board Resigns.

We learn that Mr. W. Rees Jeffreys has resigned his position as secretary of the Road Board, and accepted the position of financial adviser to the Motor Union Insurance Co., Ltd., of which he was one of the founders.

More Petrol for Motorists.

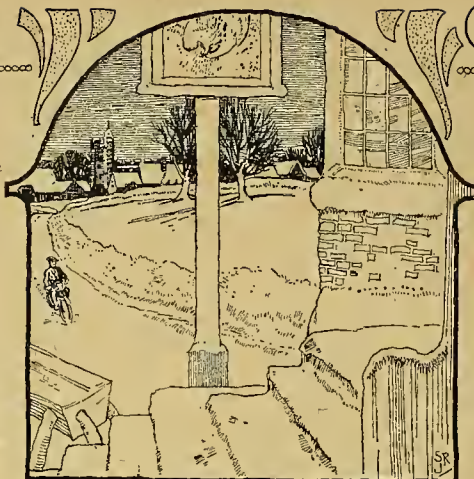
Though the restrictions on the use of motor vehicles have been removed, it is not yet possible for the Petrol Control Department to dispense with the system of licences to obtain motor spirit. Under the Finance Act, 1916, a duty is payable by holders, and until the Act is repealed by Parliament licences will continue to be necessary. New applicants have no difficulty in obtaining licences. The quantities of spirit that the Department is prepared to allocate to existing licence-holders are now very much greater, and no reasonable requests will be refused. The Motor Spirit Restriction Orders will be revoked entirely by the Board of Trade from January 10th.

Petrol Allowances.

We are informed by the Petrol Controller's Department that the following allowances will be made to motor cyclists: Six gallons per month to owners of solo machines; ten gallons a month to owners of sidecar machines, and in exceptional cases, where the machine is in the employ of a recognised firm, an allowance up to fifteen or sixteen gallons a month. Tricars, by which we presume that trade carriers and Morgans are meant, will be allowed sixteen gallons a month.

Accessory Thieves' New Tricks.

We quote from a letter received from a reader: "A few weeks ago I inserted an advertisement in *The Motor Cycle* for a Williamson for sale. While away from home a prospective buyer called, and asked to see it. My wife showed him the machine, and left him for a few minutes. When she came back from the house he expressed every satisfaction, and left, saying he would buy it, and that he would call to see me later. When I returned I missed one set of J.A.P. and two King Dick engine spanners, which could only have been taken while he was left alone, as the shed where the machine was kept was previously locked. Needless to say he did not turn up as arranged."



Special Features.

THE FUTURE OF SURPLUS GOVERNMENT MACHINES.
SINGLE, TWIN, OR FOUR.

Bluemel Brothers, Ltd.

At the annual meeting of the above, the directors recommended the payment of a dividend on the ordinary shares of 1s. 4d. per share, less income tax, amounting, with the interim dividend paid in June last, to a total of 10%, plus a bonus of 1s. per share, less income tax, making 15% for the year.

A Motor Cycle Club for Ealing and District.

It is proposed to form a motor cycling club for Ealing and District. It is the intention of the promoters to maintain a vigorous and novel programme, including an entirely new form of inter-club team competition, which, it is hoped, will greatly stimulate club activity. The social side will be well catered for, the club having had the offer of the use of a large club room gratis. In this connection, club runs will be eagerly looked forward to after the enforced idleness of the past four years. These runs will be combined with a social event, and will give members an object in riding. Lady riders are invited to join, for it is felt that the lady members will be well represented by ex-R.A.F. motor cyclists and others. The club will be affiliated to the Auto Cycle Union, whereby members will become entitled to the privileges conferred by that body. The cycle car user's interests will be studied, and a class arranged for this vehicle in competitive events.

Every rider who is interested should write to Mr. S. P. L. Brown, 25, Orniston Road, Shepherd's Bush, W.12



A meet of motor cyclists on a recent Sunday at Owl Bar. This rendezvous was a popular one for Sheffield riders before the war.

Honour for Well-known Motor Cyclist.

Mr. Guy Lee-Evans, one time famous Indian rider, has been awarded the O.B.E.

Belgian Motor Cycle Trade.

Belgian manufacturers of cycles and motor cycles are about to form a society for their protection and to further the manufacture and export of Belgian machines.

Lecture in Sheffield.

On January 18th, Mr. L. B. Henderson, A.M.I.A.E., will speak on the care, upkeep, and tuning of motor cycles before the Sheffield District N.M.C.F.U. The lecture will be held in the Imperial Hall, Pinstone Street, Sheffield.

The Industrial Reconstruction Council.

A conference on "Reconstruction or Restoration" will be held under the auspices of the Industrial Reconstruction Council on Tuesday, January 14th, at 6 p.m., in the Hall of the Institute of Journalists, 2 and 4, Tudor Street, E.C.4. The chair will be taken by Sir Henry Urwick, of Messrs. Fownes Bros. and Co.

The War Work of the M.A.G. Engine Designer.

Mr. Osborne de Lissa, of the M.A.G. Engine Co., Ltd., whose "Opinion" we give on another page, was, during the war, appointed to a position in the M.O.M. Gun Machine Tool Department, and later transferred to the Technical Department of the Air Ministry.

A Stolen Motor Cycle.

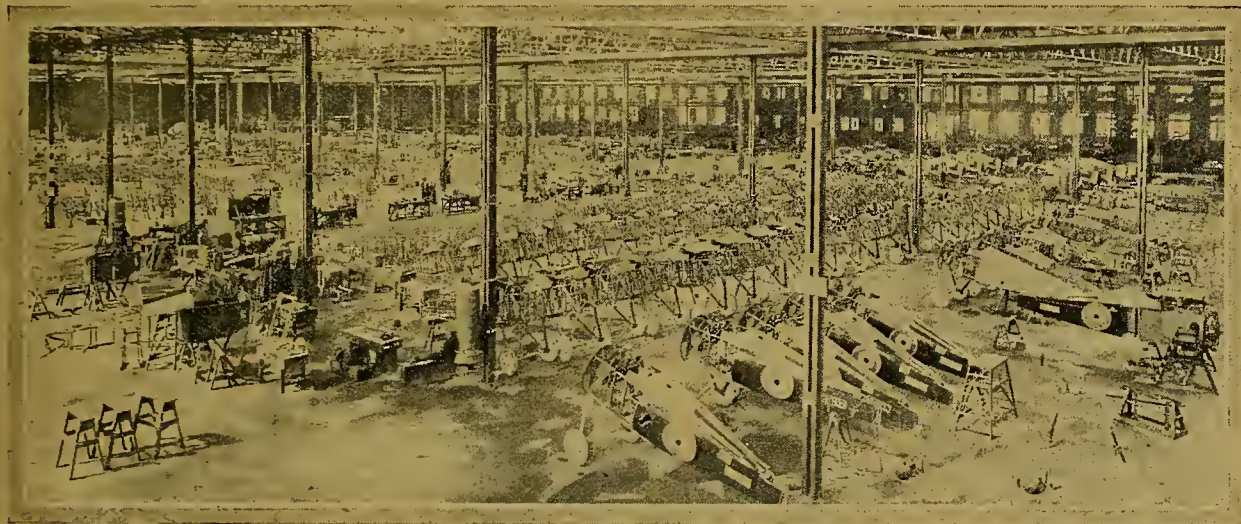
A reader of *The Motor Cycle* who is quite well known in the competition world has recently had his motor cycle stolen by means of an ingenious trick. Immediately after he had left his residence a soldier called upon his wife, saying that he had called at the request of the owner on behalf of a certain major to take delivery of the machine, which was advertised for sale. It has not been seen since.

The motor cycle is an Imperi two-stroke, all black finish, tank enamelled French grey and green, complete with horn, lamp, new tyres, and belt. The magneto chain cover is broken near the top, and the off-side footrest has been broken and not very neatly welded. Should anyone hear of this machine he is requested to correspond with the Editor, *The Motor Cycle*.

Second-hand Prices.

We give below the average prices of motor cycles and combinations from advertisements which have appeared in three previous issues of *The Motor Cycle*:

	1913 and Earlier.	1914. '15-'16.	'17-18
A.J.S., sidecar	£75	£85	—
Allon, 2-stroke, 2-speed ..	£26	£35	£38
Alldays, 2-stroke, 2-speed ..	£25	—	—
Ariel, 5-6 h.p., sidecar ..	£65	—	—
Bat-Jap, 8 h.p., sidecar ..	—	£70	—
Bradbury 4 h.p., belt ..	£20	—	—
Calthorpe, 2-stroke	—	£27½	—
Calthorpe-Jap, 2½ h.p., 2-s.	—	£28	—
Ditto, 6 h.p., sidecar ..	—	£70	—
Chater-Lea, sidecar	£39	£50	—
Clyno	£63	£58	£100
Douglas, 2½ h.p.	—	£36	£40
Douglas, 4 h.p., sidecar ..	—	£60	—
Enfield, 6 h.p., sidecar ..	—	£50	£85
Harley-Davidson, s/car.	—	—	£80
Hobart, 2-stroke	—	—	£35
Humber, 3½ h.p., 2-speed ..	£20	—	—
Indian, 7-9 h.p., sidecar ..	—	£47	£56
James, 3½ h.p., sidecar ..	—	—	£90
Levis	—	£24	—
Matchless, 6 h.p., sidecar	£60	—	—
New Hudson, 3½ h.p., s/c.	£32	£40	—
O.K., 2½ h.p., 2-speed ..	—	—	£30
Premier, 3½ h.p.	£22	—	£33
Rover, 3½ h.p.	—	—	£66
Rudge-Multi	£19	£31	£57
Sunbeam, 3½ h.p., s-car.	—	—	£70
Triumph	£25	£38	£49
Zenith, 8 h.p.	—	—	£65



Where the A.B.C. is to be made—the Sopwith aviation factory at Ham, Surrey. The A.B.C. programme consists of the production of a spring frame four-speed 3 h.p. flat twin lightweight, which is to sell at £70.

PROHIBITION ON EXPORTS REMOVED.

IN a recent issue, when writing of the coming motor show at Barcelona, we referred to the difficulty experienced by British makers in getting the necessary permits to export their goods. In view of the urgency of the matter we also wrote to the Board of Trade on the subject, and are pleased to be able to tell our readers that the difficulties to which we alluded are now entirely removed. We append our letter to the President of the Board of Trade, together with the reply which we have received:

The President of the Board of Trade.

Dear Sir,—I have received information from Spain that a motor car and motor cycle exhibition is to be held in Barcelona early in March next. My correspondent informs me that, while American manu-

facturers are sending to this exhibition everything that is asked, British makers, although in many cases they have the goods in stock, are finding difficulty in obtaining the necessary permits to enable them to export the goods before it is too late.

May I therefore, with all due respect, lay before you the extreme importance of this matter, in view of the very serious position in which the motor cycle industry of this country finds itself in its present competition with its chief rival, and urge the desirability of immediately removing the restrictions which have, as a necessary war measure, been placed on the export of manufactured goods.

Your obedient servant,

THE EDITOR.

Board of Trade (Commercial Relations and Treaties Dept.), Whitehall, S.W.1.

Sir,—With reference to your letter of December 27th, I am directed to draw your attention to the notices which have appeared on pages 791 and 819 of the *Board of Trade Journal* of December 19th and 26th respectively, from which it will be observed that the goods in question have been transferred to List C of prohibited exports. I am at the same time to point out that by an Order of Council dated December 24th, 1918, Spain was added to the countries excepted from the prohibitions relating to articles included in that list, and that goods referred to can therefore be exported to Spain without licence.

Your obedient servant,

H. FOUNTAIN.

"SINGLE," "TWIN," OR "FOUR?"

The Lessons of the Plebiscite. Data concerning the Proportionate Popularity of Various Types of Engines.

IN announcing the result of the "Which Type" referendum last week, we stated that, although the flat twin as a solo machine engine secured the greatest number of readers' votes, the single-cylinder was a very close second.

We repeat this in justice to the single-cylinder engine, and in full appreciation of the probability that, whereas this type of engine secured its support on good service in the past, the flat twin scored more on its *theoretical* advantages. This is not saying that practical experience with a flat twin would modify this judgment, but we think quite a large percentage of those readers who regard the 500 c.c. flat twin as their ideal have based their preference on theory, because it is doubtful whether, excepting the $2\frac{3}{4}$ h.p. Douglas, so many flat twins have been produced as the number of forms specifying it which have been received.

The various types were represented by the following percentages:

	Solo.		Sidecar.
Flat twins	40%	....	28%
Singles	36%	....	16%
V twins	13%	....	35%
Four-cylinder	5%	....	20%
Other types	6%	....	1%
	100%		100%

Two-stroke or Four-stroke.

Considering the number of "utility" two-strokes on the road, and the evidence that they are giving their owners satisfaction, it is, at first sight, rather surprising that their popularity was not registered. The voting on two and four-strokes was as below:

	Solo.		Sidecar.
Two-stroke	6%	....	4%
Four-stroke	94%	....	96%

Before concluding that the two-stroke has really lost its popularity, and that the above figures are a true indication regarding the demand in the future, it is well to view the matter in its broadest aspects.

The main object of the Referendum is to assist manufacturers to judge public opinion, therefore it must not be overlooked by them that the majority of users of the little two-stroke buy it because it

is cheaper than a four-stroke, and that if such riders have ideals, in all probability these would include larger and more powerful engines than the usual two-stroke, of such a size of cylinder, in fact, as does not exist in two-stroke engines. Again, the two-stroke machine is used more as a utility machine than as a sportsman's mount, and to the former class of rider mechanical ideals do not exist. He requires a machine for general "pottering about," and so long as the little two-stroke does this, he does not trouble.

Therefore, the fact that so few of the total forms specify two-stroke engines is no criterion that no demand exists for the simpler type. It appeals to a totally different class of rider from that which responded to our invitation to compile a specification.

Incidentally, it should be noted that the number of engines under 300 c.c. which were specified was infinitesimal: in fact, solo engines of over 1,000 c.c. scored over ten times the votes. The two-strokes mentioned were of suggested new types.

Engine sizes were divided up as follow:

SOLO ENGINES.

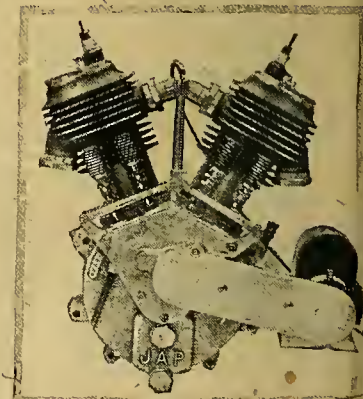
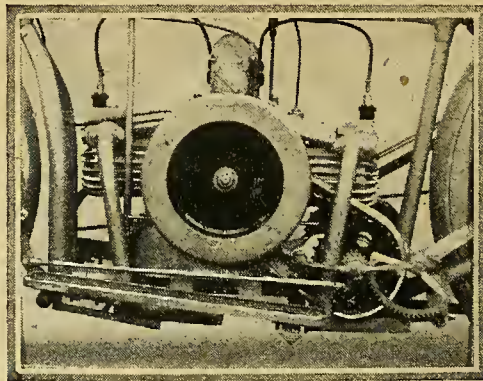
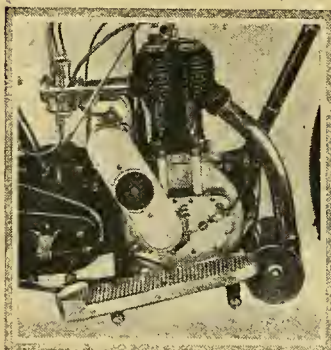
Under 300 c.c.	0.04%	700 c.c.	3.7%
300 c.c.	3.8%	750 c.c.	4.7%
350 c.c.	5.0%	800 c.c.	1.5%
400-475 c.c.	1.5%	850 c.c.	0.3%
500 c.c.	32.7%	900-925 c.c.	1.2%
550 c.c.	21.5%	975 c.c.	1.3%
600 c.c.	9.8%	1,000 c.c.	5.0%
650 c.c.	5.8%	1,050 c.c.	0.5%
675 c.c.	1.0%	1,100 c.c.	0.7%

SIDECAR ENGINES.

500 c.c.	4.9%	850 c.c.	2.2%
550 c.c.	6.8%	900 c.c.	5.5%
600 c.c.	7.2%	925-975 c.c.	5.4%
650 c.c.	5.0%	1,000 c.c.	31.0%
700 c.c.	4.9%	1,050-1,100 c.c.	1.4%
750 c.c.	19.8%	1,200-1,500 c.c.	0.9%
800 c.c.	5.0%		

If we divide the engines of the solo class into groups we see that solo riders are more enthusiastic concerning higher powers than 500 c.c. than for engines smaller than this size:

Under 500 c.c.	10.3%
500-600 c.c.	70.8%
700 and over	18.9%



The popularity of the above three types, according to the voting, is in the following order: Flat twin, single, and V type twin.

Single, Twin, or Four?—

Dividing up the sidecar engines in a similar way, we obtain the following figures:

Under 650 c.c.	23.9%
700-900 c.c.	37.4%
Over 900 c.c.	38.7%

* Including 31% 1,000 c.c..

From the above it will be seen that over 75% favour engines larger than 700 c.c. for sidecar work, and that a proportion greater than this prefers engines of 500 c.c. and over for solo use. Before the war the trend of design was towards the 750 c.c. twin for sidecar work and an engine smaller than 500 c.c. for solo purposes. What has happened to cause this ebb and flow of public opinion? Is it the usual cry of the enthusiast for more and more power? Certain it is the 350 c.c. engine just fails fully to satisfy the solo rider who requires speed and means to maintain high averages. The 500 c.c. engine gives him that extra reserve which in the sidecar class is represented by the difference between 750 and 1,000 c.c.

So far, we have considered figures broadly. In order to gauge public opinion correctly, it is necessary now to take each type of engine separately. We then find the proportionate popularity of the various sizes in the different types.

ENGINES FOR SOLO MACHINES

Single-cylinders.

300 c.c.	6%	550 c.c.	30%
350 c.c.	7%	600 c.c.	10%
400 c.c.	1%	700 c.c.	2%
500 c.c.	44%		

Flat Twins.

300 c.c.	3%	600 c.c.	12%
350 c.c.	8%	650 c.c.	5%
400 c.c.	1%	700 c.c.	4%
500 c.c.	52%	800-1,000 c.c.	1%
550 c.c.	13%		

V TWINS.

400-450 c.c. ...	2%	700 c.c.	4%
500 c.c.	18%	750 c.c.	22%
550 c.c.	10%	800 c.c.	2%
600 c.c.	8%	850 c.c.	2%
650 c.c.	8%	1,000 c.c.	24%

FOUR-CYLINDER.

600-650 c.c. ...	20%	1,000 c.c.	35%
750 c.c.	15%	1,100 c.c.	14%
800-900 c.c. ...	16%		

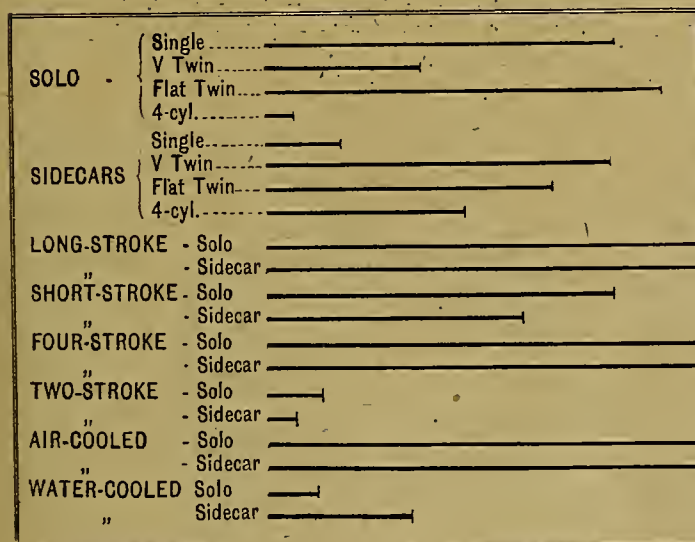
These figures are interesting, and show that 70% of the single enthusiasts favoured the $3\frac{1}{2}$ -4 h.p. proposition, which is not surprising considering the number on the road. This seems to contradict previous deductions, and rather shows that many owners of such machines are perfectly satisfied on the point of power. In the flat twin group also the 500-600 c.c. sizes together secured 77% of the votes.

To summarise solo engines we have the following table to show the proportionate values of the most important of the various types and sizes. From this it will be seen that, while in the flat twin group 20% voted for 500 c.c. and only 5% for 550 c.c., single cylinders of these sizes scored approximately 15% and 10% for 500 and 550 c.c. respectively. Therefore, taken together, the 500 and 550 c.c. flat twins scored 25% and the singles 25.7% of the solo specifications.

Summary of Solo Engine Referendum revealing the great popularity of the 500-550 c.c. sizes.

Types	Votes per 100.	C.C. Capacity.—Votes per 100 of all Solo Machines.									
		300.	350.	400.	500.	550.	600.	650.	700.	800.	1,000.
Flat twins	40	1.2	3.2	0.4	20.8	5.2	4.8	2.0	1.6	0.2	0.2
Singles	36	2.1	2.5	0.3	14.9	10.8	3.6	0.7	—	—	—
V twins	13	—	—	0.2	2.3	1.3	1.0	1.0	0.5	2.8*	3.1
Four-cylinder	5	—	—	—	—	—	—	0.10	0.07	0.08	0.17

* 750 c.c. capacity. Engines larger than 1,000 c.c. and unconventional types are omitted.



A CHART SHOWING THE PROPORTIONATE VOTING FOR VARIOUS TYPES OF ENGINES.

In the short stroke group is included engines with cylinders approximately "square" in their bore-stroke ratios

Summary of Engines for Sidecars, in which nearly Thirty per Cent. are 1,000 c.c. :

Types.	Votes per 100.	C.C. Capacity.—Votes per 100 of all Sidecar Machines.									
		500.	550.	600.	650.	700.	750.	800.	850.	900.	Over 1,000.
Singles	28	8.9	5.6	6.7	3.3	1.1	—	2.2	0.2*	—	—
Flat twins	16	0.9	1.6	1.9	0.7	1.8	4.5	0.9	0.6	0.7	2.2
V twins	35	—	1.7	0.7	2.8	2.1	9.4	1.4	—	4.5	13.6
Four-cylinder	20	—	—	—	—	—	2.4	—	0.6	0.8	13.8

* Several over 850 c.c. and under 1,000 c.c. suggested. Unconventional types omitted.

The sidecar engine figures are just as interesting, and taken separately according to type the following figures are obtained:

ENGINES FOR SIDECAR MACHINES.

Single-cylinders.

500 c.c.	32%	650 c.c.	12%
550 c.c.	20%	700 c.c.	4%
600 c.c.	24%	800-900 c.c. .	8%

Flat Twins.

500 c.c.	6%	750 c.c.	26%
550 c.c.	10%	800 c.c.	6%
600 c.c.	12%	850 c.c.	4%
650 c.c.	6%	900 c.c.	4%
700 c.c.	12%	1,000 c.c.	14%

V Twins.

550 c.c.	5%	800 c.c.	4%
600 c.c.	2%	900 c.c.	13%
650 c.c.	8%	1,000 c.c.	38%
700 c.c.	6%	Over 1,000 c.c. .	1%
750 c.c.	23%		

Four-cylinders.

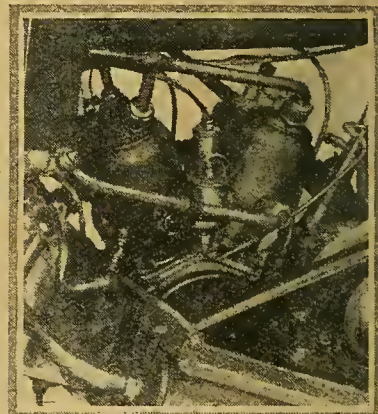
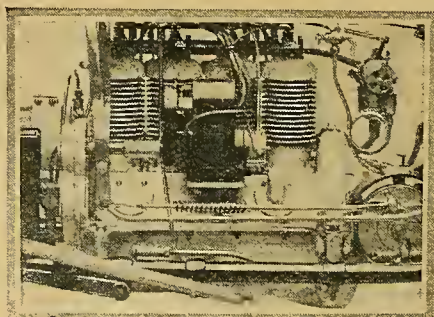
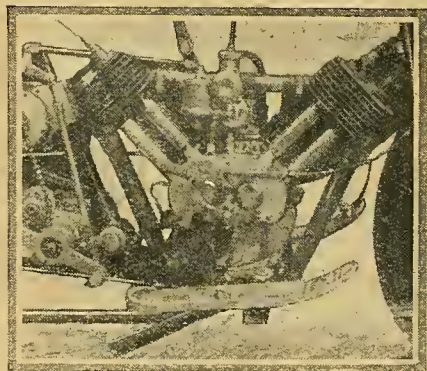
750 c.c.	12%	1,000 c.c.	69%
850 c.c.	3%	Over 1,000 c.c. .	12%
900 c.c.	4%		

The 1,000 c.c. Engine.

From the foregoing it will be seen that a larger number of readers voted for the 1,000 c.c. four-cylinder engine than for a V twin of this size. This, probably, was to be expected when it is considered that the sidecar "4" must, of necessity, be over 750 c.c. owing to the smallness of the cylinders of an engine of lower capacity, whereas the twins begin the range of sizes at 550.

It should be noted that quite a number of specifications were suggested as ideal for dual purpose machines, hence the relatively large number of 500

Three kinds of engines which depart from the most general types. Ten per cent. of the voters for V twins specified the 90° type. Twenty per cent. of the specifications called for four-cylinder engines in the sidecar group and five per cent in the solo class.



c.c. singles which, before the war, was a very popular size for this purpose.

It should be recorded that nearly 10% of the V twin enthusiasts in both solo and sidecar groups specified a 90° engine.

Air or Water-cooling.

As will have been anticipated, only a small proportion of readers specified water-cooled engines, the percentage being 5% in the solo and 14% in the sidecar group.

We now come to the question of long or short-strokes, and we think this will cause surprise to the thinking reader, as the long-stroke scores heavily in both solo and sidecar groups. The surprise lies not so much in that so many should favour the long-stroke—the merits or demerits of the two types are still controversial. We are surprised because only a very small proportion of readers who sent in specifications can have had experience with long-stroke engines, since so few makes embody them.

Here we see evidence that those readers who have ideals have closely followed the technical articles in this paper, and that on the success of the Norton long-stroke engine and the theoretical advantages of the type many have specified long-stroke irrespective of the type of engine.

In the foregoing we have endeavoured to thrash out the question of engine types and power, and we think it will be agreed that the popularity with potential buyers of the respective alternatives is very clearly shown.

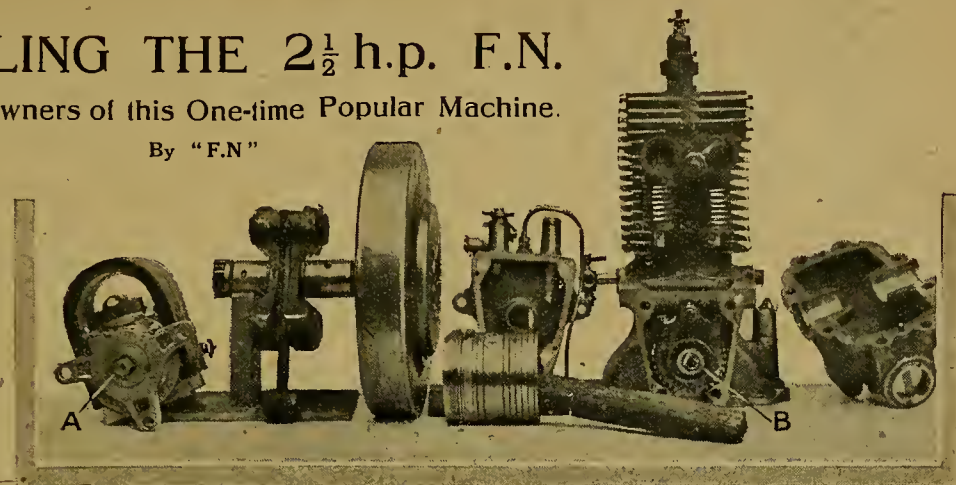
In subsequent issues we hope to deal with other points of specification in a similar way until the maker will have, for the first time, reliable data to assist him in formulating his policy in the immediate future.

OVERHAULING THE 2½ h.p. F.N.

A Few Hints for the Owners of this One-time Popular Machine.

By "F.N."

That the products of the F.N. Company found enthusiastic devotees is undoubted, but, perhaps, as an outstanding pioneer it has not received as much attention as it deserves. Here we give the opinion of an F.N. user as to the best method of conducting an overhaul.



The engine assembly Note the specially-shaped magneto shaft A, which can only fit in one position into the hole B in the timing gear.

A *PRIMA-FACIE* consideration with motor cyclists is that of accessibility. With the F.N. the fact that the cylinders cannot be removed without first taking out the engine from the frame may appear somewhat of a drawback, but the latter operation is, however, a remarkably simple matter.

The engine, complete with carburetter, inlet, exhaust pipes, and magneto, can be removed as a unit from the frame by withdrawing two long bolts that pass through the frame lugs and the cylinder casting, first having detached the exhaust lifter, petrol and oil pipes, and carburetter controls. It is also necessary to withdraw the bolt A (fig. 1), which allows the trusspiece between the rear of the engine and the gear box to swing clear.

It will assist matters if a strap is passed over the tank tube and threaded between the valve pockets and the cylinder (fig. 1), so as to take the weight of the engine, which may then be slid forward about an inch to bring the inner clutch member free of the front universal joint on the gear box.

The gear box can be removed in a similar manner by withdrawing two long bolts, but as it is hardly ever necessary to interfere with this, only a brief reference will be made to it later on.

Taking Down the Engine.

The magneto is detached by undoing three screws which hold its specially-shaped back end plate to the timing gear cover. It can be taken off and replaced without trouble, as the armature shaft is specially shaped and extended so as to fit into a hole of corresponding shape in the large 2 to 1 gear. Consequently if the valves are correctly timed the magneto must be also.

There is a paper washer between the magneto endplate and the timing cover, which should be renewed if it has become torn, and a groove will be observed in the timing cover leading from the large gear wheel housing to the edge of the timing case. It is important that this should be kept free from dirt, as its purpose is to lead away any surplus oil from the timing gear, so that it does not enter the magneto.

To take the engine to pieces, first take off the oil cap on the mainshaft between the flywheel and the crank case. This is a brass ring in two halves held together by a couple of small screws. Remove the timing gear cover with its paper washer, and it will be seen that the timing wheels are provided with a mark upon each, so that when retiming the engine it is only necessary to make the two marks come together to ensure the valves being properly set. Before removing the exhaust and inlet rockers, mark the former, so as to know which is which. If this is not done, they may be transposed in re-assembling, with the result that the timing is slightly varied.

The bottom half of the crank case can now be removed by undoing eight screws, permitting the complete crank and piston assembly to be withdrawn. Note that the locking ring of the inspection window in the sump is left-hand thread.

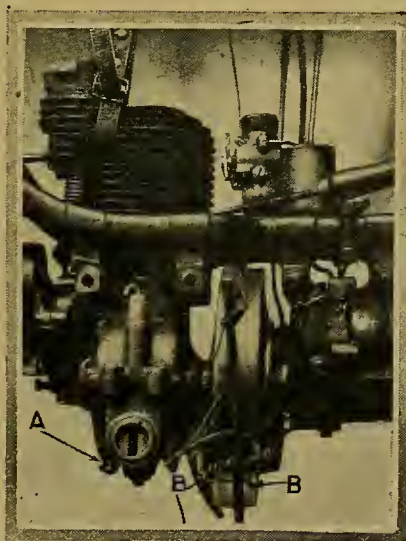


Fig. 1.—The tyre levers, lashed together and tightened with a tourniquet are to compress the clutch, thus affording more clearance in replacing

Unless new bearings are required, it is not necessary to remove either the flywheel or the small pinion. The former is keyed to the tapered end of the mainshaft, and secured by a right-hand threaded nut. If this nut must be taken off, it is best to make a special tool for the job. This can be made from a piece of tube of suitable bore, with four small pegs screwed in at right angles to each other at one end, so as to engage with the slots on the nut.

The Crankshaft Assembly.

The small pinion screws straight on to the other end of the mainshaft with a left-hand thread, and here again a special tool should be made on the same lines as that just described. On no account try to shift it with a pair of gas pliers or by using a punch against the teeth. The pinion and the mainshaft should be marked so as to ensure that the pinion is screwed on tightly enough when replacing. If it is not screwed back again to the same position, the timing of the valves will not be the same as it was before. A good tip for marking hardened steel is to draw a thin line across the parts in ordinary black paint, taking care not to touch it until it has set.

The crank pin is secured to each web by means of a plain taper and right-hand nuts, which are furnished with locking plates bent over the sides of the web to stop them from turning.

When reassembling the crankshaft, it is necessary, in the absence of a special jig, to put the assembly between the centres of a lathe, and accuracy can be secured by the use of a sensitive dial indicator. If the owner of the machine has not got these appliances at his disposal, it is better not to disturb these parts unless a new crank pin bush is needed. This bush is permanently fixed to the crank pin, and revolves in the hardened end of the rod. There is no gun-metal bush in the small end, the gudgeon pin merely taking its bearing in the hardened end of the connecting rod.

The best thing to do in the event of serious slackness in the small end is to soften it in the fire and reamer out a true hole somewhat larger than the previous

Overhauling the 2½ h.p. F.N.—

one. The small end can now be re-hardened, and a new gudgeon pin must be made, the bosses in the piston being reamed out to make it a nice driving fit.

The interior and exterior of the piston should be thoroughly cleaned of carbon deposit. If there is very much of this behind the rings they should be carefully removed and the grooves scraped out. If the valves require grinding in this can now be done, and when being refitted, the stems and guides should be well coated with graphite grease. The springs keep very cool and seldom require re-newing.

Whilst the engine is in pieces take the opportunity of thoroughly clearing out all oil holes and ducts, and after the necessary adjustments and replacements have been effected a liberal supply of clean engine oil must be introduced to all bearings before starting the reassembling process.

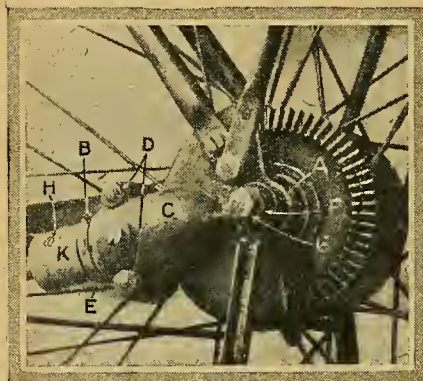


Fig. 2.—The bevel drive, wrongly alleged to be mysterious.

Examine the centre part of the clutch which carries the thrust cone and transmits the drive. This is secured to the centre stamping, which carries half the plates, by copper rivets. It sometimes happens that these wear slightly through harsh handling of the machine, and if they have become slack they should be replaced by new ones, or they may shear clean off in time.

The clutch should not require to be dissected, but this can easily be effected by undoing six long screws, allowing the two halves to separate.

The method of assembling the layers of outer and inner plates should be noted, and the plates cleaned and replaced.

In putting the engine together again it will be found a great convenience to remove the drain plug at the bottom of the lower half of the crank case, substituting an old sparking plug, which is happily of the same thread. The lower half of the crank case can then be held firmly in the vice by this means, and the rest of the engine built up on top of it.

The crank assembly goes back first, and it must be seen that the small dowel pin in the centre of each lower half of the main bearing housings engages properly with the corresponding holes in the main shaft bushes.

No washer of any kind is to be used between the two halves of the crank case, as these parts are machined so as to provide an excellent joint, and a washer

would prevent the main bearings being gripped firmly. Of course, both surfaces must be perfectly clean, and the eight screws well tightened up after the cylinder casting has been slid into place. The oil tap on the flywheel side may be refitted and the timing gear replaced.

Having replaced the rockers and the timing cover paper washer, the cover itself may be slid on, lifting the tappets with the fingers of one hand so that they clear the rockers. The small steady pins on the cover must not be bent or bruised or else the cover will not bed properly home.

The timing of valves and magneto should approximate to the accompanying diagram, although slight variation either way in the case of the valves is not important.

The engine is now ready to go back in the frame, and this process is simply the reverse of pulling it out.

On some machines there is not quite sufficient clearance to enable the front universal brass blocks to slide into the steel cage which screws bodily into the flywheel, and the inner clutch member should therefore be squeezed into the flywheel by the aid of a couple of tyre levers lashed together and tightened with a tourniquet (fig. 1). This has the effect of narrowing the flywheel the desired extra quarter of an inch.

The Wheels.

The only other parts of the machine which require inspection are the rear universal joint on the gear box and the bevel drive assembly on the rear wheel. The former can be inspected by releasing the snap fasteners on the domed dust cover, and any reasonable wear here may be neglected.

To take out the rear wheel, simply undo the nut on the other end of the long bolt G (fig. 2), and pull the latter straight out of the hollow axle; if the rear stays are now sprung lightly outwards with a screwdriver, the wheel will come clear away.

Probably both the small pinion and the hub bearings will need adjustment, and this must be done before the gears are checked over for correct meshing.

The hub bearings are adjusted in the usual way by the cone A and its lock-nut.

The small pinion is carried on a stub shaft which rotates in a double ball bearing. This bearing is housed in a

casing C, by means of which it can be moved nearer to or further from the centre of the wheel.

To adjust this bearing, take out the screws H which retain the dust cap K, thus exposing the rear cardan joint. Knock out the centre pin of this, and the adjusting cone and its lock-nut will be seen.

After these points are attended to, the bevels must be adjusted for correct meshing. Replace the rear wheel, slack off the nuts D, and take out the stud E. Now screw in the sleeve B until the gears are seen to engage for their entire length, screw in the stud E so that it engages in one of the slots in the body of C, and tighten up the nuts D.

The correct depth of mesh is governed by the sleeve nut F and its lock-nut.

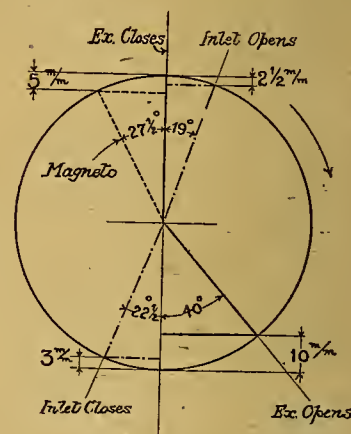
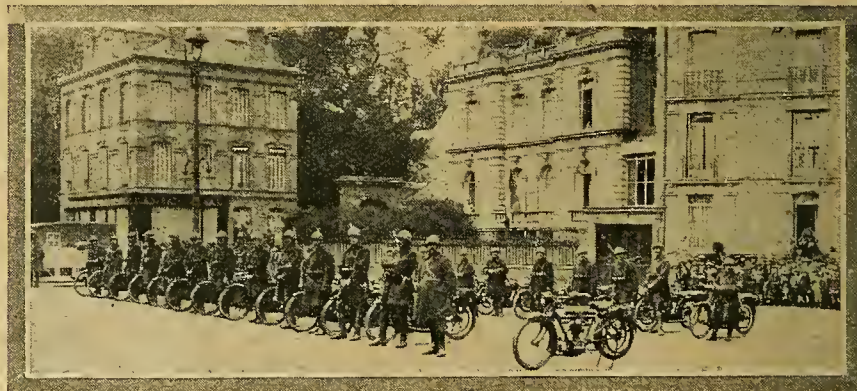


Diagram of engine timing of the 2½ h.p. F.N.

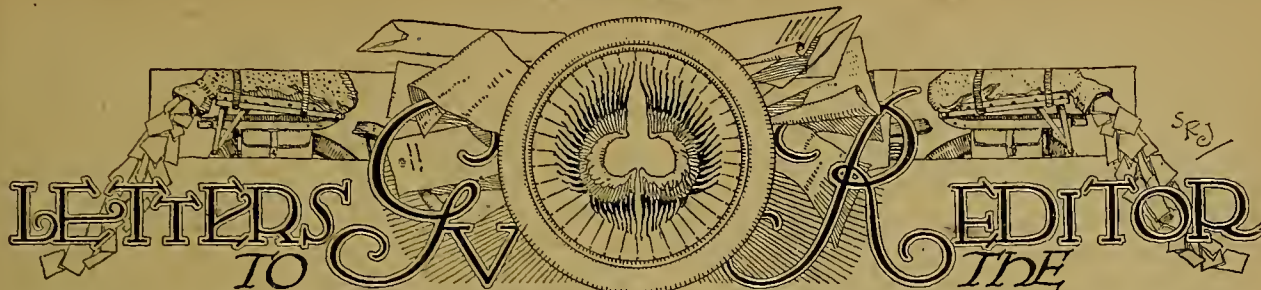
Screwing this inward simply pushes the crown wheel out of engagement with the pinion, and *vice versa*. The gears are correctly meshed when there is about 1/32 in. between the top of an engaging tooth and the bottom of its corresponding space.

Note that removal of the back wheel does not alter any of the above adjustments, which rarely require doing.

If the overhaul is properly carried out with plenty of oil in the gear box and grease in the rear bevel case, quiet and smooth running is assured for the most fastidious owner.



A section of volunteer motor cyclist Belgian scouts placed at the disposal of the French Army on the occasion of the review held on the French National Fete Day.



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

THE BARCELONA EXHIBITION.

Sir,—Mr. Harry Walker, a well-known representative of British interests in the motor trade in Barcelona, is now on his way over to this country. Mr. Walker is particularly anxious that British manufacturers should make a prominent exhibition of their productions at the motor car and motor cycle show to be held at Barcelona next March, to which you referred on December 26th last, in face of the certain and intense competition of manufacturers in enemy countries.

Spain is truly neutral in the matter of commerce, and the manufacturer who shows most enterprise—be he British, Austrian, or German—has an equally favourable opportunity of securing the business of the country. Mr. Walker already represents in Spain the interests of Thomson-Bennett, Terry and Sons, F.R.S. mechanical lamps, Sphinx plugs, Fuller accumulators, Millennium jacks, Harvey Frost and Co., Ltd., etc., and will be glad to get into touch with other British manufacturers of motor accessories on the occasion of his visit, with a view to exhibiting their productions at Barcelona.

Mr. Walker will arrive in this country within the next week or so, and remain until the middle of February.

Communications on this subject may be addressed either to the Sphinx Co., Bradford Street, Birmingham, or 107, Bishops-gate, London, E.C.2, and will receive prompt attention.

THE SPHINX MANUFACTURING CO.

POST-WAR MODELS.

Sir,—In the interests of the motor bicycle and its development, I feel I must register my keen disappointment on seeing advertised, with illustrations, so-called 1919 models of machines obviously still possessing comparatively antiquated specifications. In common with most other riders, I had looked forward to witnessing at the termination of hostilities many necessary changes in detail and design, the outcome of the drastic lessons of the war, instead of which what do we still see advertised? One of the best finished and most expensive machines shows forks of a comparatively old pattern, sprung for one direction of movement only. The footboards are unsprung, the old unsatisfactory type of rim brake is still employed; the carburettor, too, appears to be a pre-war production, well known for its simplicity and lack of refinements. (Apparently, the automatic single control apparatus has not been given the thought it deserves.) The illustration of another very popular machine still shows that crude type of transmission—the belt, with its annoying propensities for mud collecting, stretch, etc. Where is the British machine to be found embodying twist grip control?

Can it be that the unexpectedly sudden cessation of hostilities has caught most of our manufacturers napping, or is the reason for this lack of advancement due to the manufacturer possessing huge war and pre-war stocks, which, for financial reasons, he intends placing on the market before entertaining more advanced specifications? Must we patronise the American market to satisfy our requirements? VIC.

PETROL LICENCES.

Sir,—There has been such an excellent response to the Auto Cycle Union advertisements in your paper that I have been "snowed under" with requests for petrol licence application forms. To that large number of riders who have not had a prompt reply from this office, may I explain that the delay is really due to a cause which we all welcome—the impending extinction of the Petrol Control Department.

The conditions under which licences are issued are relaxed from day to day. This morning (January 2nd) it is agreed

that the official form of application should no longer be insisted on, and it is left to me to devise a simple form by which application should now be made by any rider applying through this office. The information required is the name and address, registered number and type of motor cycle, and quantity of petrol needed. The latter may be any quantity in reason.

Almost up to the end of the year licences were refused for any but business purposes, and quantities were strictly rationed. Then increased quantities of benzole as compared with petrol were announced. About this time the Petrol Control Department ran short of printed application forms, and it was not until after the Christmas holidays that official typewritten substitutes were obtainable. No sooner, in fact, had I prepared a circular letter to send out than it had to be scrapped owing to a further relaxation of the conditions.

All this work and worry could have been saved if the Government had simply cut the painter on January 1st, and had removed their control of petrol forthwith. They claim that this was impossible, as to do so needs fresh legislation. To which I reply that "where there's a will there's a way," and it should be, and is, just as easy to remove war-time restrictions promptly as we know, from experience, it is suddenly to impose them.

T. W. LOUGHBOROUGH, Secretary A.C.U.

PRICES.

Sir,—The matter raised by "Disgusted" in *The Motor Cycle* of December 12th regarding the sudden rise in price of a certain outfit without any apparent reason is certainly one which will make many prospective buyers think twice before placing an order for their next mounts.

A certain combination advertised in your esteemed paper on December 5th was priced £125, and a T.T. machine at £67 10s., whereas in your issue for December 26th the prices are £140 and £85 15s. respectively. From the wording of the advertisements these appear to be the identical machines advertised three weeks ago. Now, few machines, if any, can have been turned out in the last three weeks, therefore this increase in price—some increase, too—is being put on the same machines which were for sale at the lower price, although these have not cost the manufacturer one halfpennyworth more since the former-price was fixed.

Mr. Moore's so-called answer on this subject explains nothing. From what I have seen since being invalidated home a year ago the trouble with motor cycle agents has been to obtain new models, and not to dispose of them. In fact, from a recent review of the stocks of new motor cycles held by the leading agents, this undoubtedly appears to be the case.

H.L.I.

Sir,—I notice that "Ixion," in your issue of December 12th, says that motor cyclists must not be too optimistic about the price of motor cycles. He and others appear to hold the view that motor cycles of about 3½ h.p. will cost somewhere about £70 to £80, and that sidecar combinations will cost anything from £120 upwards.

Maybe they will, but those interested in the manufacture of motor cycles must realise that after the war America is sure to flood the market with cheap machines. They are quite capable of making a machine of even greater power for less money. As to the sidecar combination. For my part—and I think there are many like me—rather than pay £140, I shall buy a Ford for less money.

I do think it will be a terrible pity if the British manufacturer misses the trade because his prices are too high.

E. W. R. PETERSON.

THE THREE-JET BINKS CARBURETTER.

Sir,—There has been a great deal written about the "dead spot" in Binks carburetters. We have therefore tested this with an experienced rider in the saddle on the 10 h.p. four-cylinder Henderson. With the carburetter properly tuned for this machine we do not experience any "dead spot" whatever.

With the main jet two sizes too large, a certain amount of hesitation was noticed on opening from second jet to third, although it worked correctly on the pilot and second jet.

On removing the jet damper from the hole in the throttle barrel above the main jet, with the correct jets for proper running, hesitation was again experienced as before.

This proved conclusively that the cause of "dead spot" was by *incorrect jet setting and not any fault in the carburetter.*

We trust this will be of service to your readers.

We might add we are getting 75 m.p.g. out of so-called war-time "petrol" on this machine.

T. D. WHEELER, Lt.,

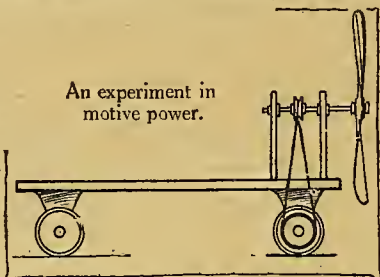
Instructor in Internal Combustion Engineering Khaki College.

J. PICKWORTH HUTCHINSON, Lt.

STREAMLINING.

Sir,—In your issue of November 7th "A Budding Pilot, R.A.F.," criticises my suggestions on streamlining a motor cycle. But, in my letter, I have not proposed to streamline a motor cycle. I only made mention of an *experiment.*

"A Budding Pilot's" criticisms are surely correct, but how does he explain the increase of speed? I believe the journal *La Science et la Vie* is much too serious and technical to make an untrue report of a test.



An experiment in motive power.

Perhaps at a very high speed the eddies formed by the plate or cone would be some feet behind the back of the rider, who would be in a vacuum. And why, if, according to "A Budding Pilot's" theories, the vacuum behind the cone is very limited, have many English D.R.'s fitted to their air intake a long pipe (generally an old horn part) to prevent the air intake being in the vacuum? I think it is a proof that this vacuum behind the cylinder (and the cone) is not like fig. 1 but like fig. 2.

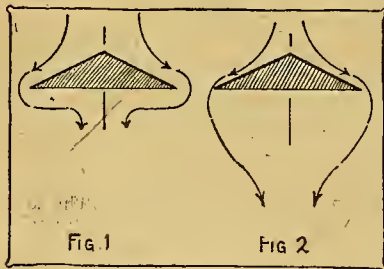
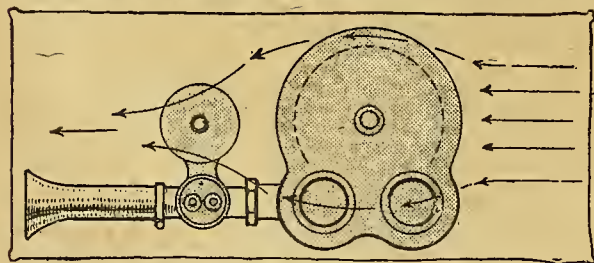


Fig 1

Fig 2

In conclusion, I must add that experiments have been made

to transform air resistance in motive power by replacing the front cone by a suitable fan, geared to the wheel of a little



A device to prevent the air intake being in the vacuum caused by deflection of air in the cylinder.

car. And with a moderate wind in front the little car was able to go against the wind. Perhaps this is the streamlining of the future.

HENRI BOURSIAC.

Rouen.

STEAM MOTOR CYCLES.

Sir,—I beg to thank "Sapper Sub" for his interest in my steam cycle design, and have pleasure in replying to his questions herewith.

May I point out that in the present design the steam pipe, which is of solid drawn steel, is taken to the throttle valve from the steam generator without a joint. At the valve the joint is made with a copper-asbestos washer and a good large nut, and in this way the troubles from leaking pipe joints, as most feelingly forecasted by "Sapper Sub," will be avoided. There is no reason, however, why the suggested asbestos-lined sheet metal guards should not be fitted, for they will prevent undue radiation.

Now for the queries:

(1.) The feed pump is single-acting, with automatic delivery valve and mechanically operated suction valve. The barrel is horizontal, and the plunger is driven by an adjustable eccentric on the layshaft, geared 2 to 1 from the camshaft. By means of a suitably shaped cam operating the suction valve, the pump delivery is proportional to the steam cut-off at all speeds of the engine.

(2.) The condensate is returned to the tank by the pressure of the exhaust steam. Very little extra back pressure is caused by this method, which has the advantage of simplicity. It is a system which has been successfully used in practice.

Water is fed from the tank to the pump by gravity. The slight "head" assists the entry of the water into the pump.

(3.) I am afraid the word "automatic," which occurred in the summary, has led to a misconception. The plant is not automatically controlled, as I am of the opinion that such a system is not practical in so small a plant as is under consideration, and, consequently, a convenient hand control was designed.

(4.) The splash system of lubrication was included, and has been successfully used with a similar engine on a steam car. However, a method of pressure lubrication to big and little ends of connecting rods, camshaft bearings, etc., which avoids the presence of surplus oil in the crank case would be an advantage, the cylinders being lubricated separately through the cylinder walls or by introducing oil into the steam pipe.

(5.) No particular method has been provided for getting rid of condensed steam, but a small wall exhaust port at the end of the stroke on the under side of the cylinders has been suggested. These ports must be connected to the feed heater box by suitable pipes.

In a plant of this nature a high superheat must be obtained for starting, when the condensation will be very little, and here the small cylinder shows to advantage, since a much less bulk of metal has to be warmed up.

There is no danger with a poppet valve engine of forcing the cylinder cover off owing to collected water in the cylinder. Under such circumstances the inlet valve opens when the compression pressure exceeds the steam pressure and so acts as a cylinder relief valve.

If any further details are desired a perusal of the original article in the *Model Engineer* of April 11th and 18th will probably meet all requirements.

I shall be pleased to see any suggestions which "Sapper Sub" may bring forward, for I must confess to taking great interest in this subject.

THOS. HINDLE.

Sir,—I note from the Correspondence section of your widely read journal that the question of steam propulsion for motor cycles appears to be coming to the fore of late. I do not know much about steam cycles, but am somewhat familiar with steam cars, and your readers may take it from me that if a steam cycle can be built which will give even half as good performance as a steam car it will have the gasoline motor cycle outclassed every way, or, as "Ixion" might put it, "beaten to the wide!"

The following summary *re* the peculiar advantages of steam, from the pen of Mr. William Fletcher, the well-known British historian of steam road vehicles, may prove of sufficient interest to warrant publication:

"The steam engine may be stopped and started in an instant. It can be made to give any power from a few foot-pounds up to its full power, and is, in fact, what railway men call *more flexible* than any other form of motor. When a hill is to be mounted the four or five horse-power developed on the level road can be raised to twelve horse-power or more. Consequently, with the steam engine, steep hills can be scaled at rapid rate and all the difficulties attending bad roads can

he overcome without trouble. The steam engine is the simplest type of motor—and simplicity is a cardinal virtue—there are no gimcracks about it. Its few parts are understood by practically everyone. No special knowledge is required to attend or repair a steam engine. No breakages are likely to occur; but, should some little derangement take place, any small country engineer can put it right in a little time. The steam engine requires the smallest amount of attention . . . and experience teaches that a simple steam engine (single expansion) will give the smallest amount of trouble to the user.

"The steam engine is a well tried servant—no experiments are needed, and there are no patents to clear—its best details are perfectly free to all who choose to harness them.

"The steam engine works smoothly without jerk. It can be balanced so as to cause no vibration; both vertical and horizontal engines can be used. . . . The greatest economy may be secured by the following means. The engine will be run at fairly high speed . . . the steam will be slightly superheated to prevent cylinder condensation. The working pressure should be not less than 100 lb. per sq. inch. Expansive working is essential . . . and it should be possible to alter the range of expansion while the engine is running. . . . We would recommend the side-by-side compound type of engine." ("English and American Steam Carriages," page 68.)

It is only fair to point out that the above was written some fifteen years ago, when steam as a motive power for road vehicles was in a very much cruder state of development than we have it to-day. At least one of Mr. Fletcher's stipulations (i.e., where he speaks of steam pressures not less than 100 lb.) appears somewhat odd to-day, in view of the high pressures now found expedient and possible in modern steam car practice. Experience has likewise shown that the author's recommendation *re compounding* (as a means of procuring fuel and water economy) to be without good foundation; but in the main his statement of the case for steam is every bit as valid as if written yesterday. His reference to the steam engine as being entirely free from what he terms *gimcracks* I consider to be particularly happy, in view of the present-day trend toward twelve cylinders, magnetic clutches, hydraulic transmissions, electric gear-shifters, etc., in the "gas" car world.

So far I do not recollect having noticed any actual motor cycle specifications incorporating any of the above named "refinements," but unless the steam cycle comes speedily to our rescue I doubt not that motor cyclists will, in the course of time, be afflicted with each and every one of these trouble-making "gimcracks"—twelve cylinders, possibly, excepted. One enterprising American firm has already tried to give us electric starters, and rumour has it that another is now experimenting with an eight-cylinder engine of the V type.

Congratulations to Rev. T. Bayden Singleton for broaching the question of *steam cycle cars*. I concur, heartily, in the opinion that the same would be "an extremely interesting proposition." But why on earth mount the boiler as well as the engine on the rear of the chassis and thus make directly for *inaccessibility*? Have we not already had a plethora of this on our motor cycles?

Such a vehicle as Mr. Singleton has in mind, notwithstanding that he dubs it a "cycle car," would be, in fact, nothing more or less than a miniature steam car. I am working along this line myself, and if Mr. Singleton is thinking of building such a 'bus and cares to give his address and describe his requirements *via* these columns, I will undertake to see that he is supplied with some literature and information which may assist him in solving such difficulties as "housing the boiler" and kindred problems.

It is my opinion that if steam advocates and experimenters would only co-operate a trifle more freely in the exchange of views and information the development of both steam cycles and cycle cars would advance much more rapidly. In this connection I should say that I am given to understand that at least two steam motor cycles have already been built in England commercially. Will some one be kind enough to furnish a little reliable information regarding them? Who were the makers? What did the machines weigh? How did they run? Were they good hill-climbers? Are any of these 'buses still in service on English roads?

Since the above was written *The Motor Cycle* of October 24th has come to hand, and I note therein the steam cycle designed by Mr. T. Hindle. This machine looks pretty good

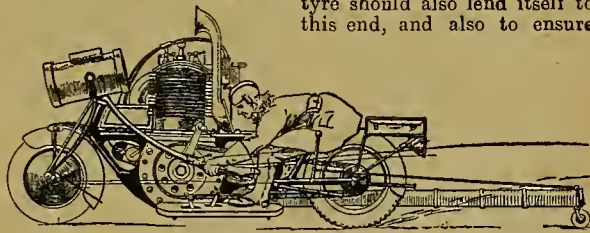
to me. Its one weak point, as I see it, is the boiler, or, rather, the steam generator. "Flash" boilers of many types have been tried out by American steam car builders. They were not considered a success, and have long since given place to *true* boilers of the "water content" type. In view of this fact, it seems questionable whether the "flash" steam system will prove entirely satisfactory on motor cycles.

Western New York State, U.S.A. SLIDE VALVE.

WHICH TYPE?

Sir,—I am sending a few suggestions made by a few knuts round the fire one evening during a discussion on "Which type?" I have tried to picture the sort of type it would be if some of them were adopted. Unfortunately, I have had to leave more than half of these comforts out, but I have tried to show the principal ones.

You will notice that the big single seems to be a favourite, with its long exhaust pipe, which has a joint in it to allow of easy cornering; also there is a small wheel on the handle-bars for the same purpose. The periscope would be useful, as well as necessary. A good searchlight must be fitted; this one takes 12 amps. 60 volts, similar to those we use in France. The generator is fitted at the rear of engine, under the oil tank. The machine is geared 1-4, not 4-1, so as to be able to get a good burst of speed. The back tyre should also lend itself to this end, and also to ensure



good hill-climbing. Overhead valves are fitted, also overhead carburetter. The question of petrol and oil capacity seems difficult, but this is a detail. It is a free engine, and there is possibly a kick starter on the other side.

You must excuse us getting like this, but we have not had a crash for two and a half years, and we are beginning to dream dreams. Still, we are thankful for small mercies, as the "Blue 'Un" turns up week by week, so we have our rides on paper. (CPL.) R. CHILDS, R.E.

Sir,—The question of "which type" of machine seems to be one of decided interest. We are always meeting single-cylinder, V twin and flat twin enthusiasts. Each type undoubtedly has its advantages. I do not think any of them will die out or become obsolete.

The single-cylinder will always remain as the general utility and reliability mount. It will always have a sphere as a fast machine (e.g., Norton, Rudge-Multi, etc.). Also, it is well known that a single-cylinder machine pulls a sidecar much better than any twin of the same power. The small flat twin mount is essentially a comfortable and luxurious machine. It has a good future as the "speedman's" machine (i.e., 500 c.c. A.B.C.).

The V twin is a very good machine for heavy combination work, and also has a remarkable acceleration. But I am rather inclined to think if a large flat twin engine could easily be put in a frame it would out the V twin.

One really comes to the conclusion that the single-cylinder machine is the one for general utility, the flat twin for fast riding, and the V twin for combination work. R.N.

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QUESTIONS AND REPLIES

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C.4, and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

Clutch Adjustment.

Q. I have a Premier two-speed countershaft machine but cannot find means to adjust the clutch, which is slipping. How is this done?—O.E.

The clutch is within the gear box, and it is necessary to dismantle this to effect adjustment. Probably the plates are worn.

Magneto Adjustment.

Q. My motor cycle is a 1918 Triumph with an M.U. magneto. The other day I removed the contact breaker. Upon replacing it and examining to see if I had replaced correctly, I found a "fat spark" passing between the platinum points. (1.) I wish to know if such sparks are in order? (2.) How to separate these platinum points so as to clean them or hammer them, as recommended in "Hints and Tips."—J.C.S.

(1.) You will probably find that there is a condenser connection on the contact breaker cover; consequently, if the magneto is rotated with the contact breaker removed there is nothing to quench the spark at the platinum points. (2.) The platinum points may be cleaned by rubbing them lightly with a jeweller's file, which is inserted by pressing down the keel of the rocker arm when this is free of the cam. To hammer the points they have to be removed.

Irregular Running.

Q. I have a 1914 three-speed Triumph and sidecar. When the engine is throttled down to twelve-fifteen miles per hour I find it pulls irregularly, runs for a few yards regularly, and then slows up for a few seconds and picks up again. At the same time a hissing sound occurs from the crank case release in the centre of the pulley nut. This only happens as a rule when riding alone. With a passenger, or on a slight gradient, or against a head wind it does not often occur.—A.R.

It is by no means uncommon to find that an engine will run irregularly at speeds of fifteen miles an hour and under. This is nearly always due to the carburettor being in need of adjustment; either there are air leaks in the carburettor or induction pipe unions or too small a jet is fitted. The air, of course, must be closed, or nearly closed, when you are attempting to run slowly. The hissing sound you refer to is quite unimportant; probably it occurs all the time, but you only hear it when throttled down.

READER'S REPLY.

Straying Cattle.

May I call your further attention to the query on page 512 of your issue of December 5th re straying cattle? I would suggest that your opinion as given is not quite correct. It is clearly an offence for an owner to allow his cattle to be lying on the highway, and any person may prosecute, but it is doubtful, should "A.A." prosecute the owner of the cattle for lying on the highway, whether he would be in any better position in regard to his claim for damages. If I were in his position I should sue the owner of the cattle for damages sustained by his act, or default, in permitting his cattle, by lying on the highway, to form a dangerous obstruction to persons properly and lawfully using the highway, and I cannot well conceive the claim failing. I would advise a perusal of "Pratt and Mackenzie's Highways," also Section 5 of the Highway Act of 1864 and the cases thereon.—SURVEYOR.

Our legal adviser writes as follows: "Referring to the letter of 'Surveyor,' it seems to me that the opinion expressed by you in your issue of December 5th is the right one. In the case of Heath's Garage, Ltd., v. Hodges, decided in 1916, some twenty sheep belonging to the defendant strayed on to the highway from a field adjoining it owing to a fence being insufficient, and two of the sheep, having become separated from the others,

attempted to run across the road in front of the plaintiff's motor car, which was being driven at a reasonable speed along the highway, with the result that they collided with it and caused it to be overturned and damaged. It was held that the defendant was not liable in damages either on the ground of negligence or of nuisance to the highway, as, apart from his liability to be fined under Section 25 of the Highway Act, 1864, he was under no duty to fence his land so as to prevent his sheep straying on the highway. This decision of the Divisional Court was affirmed. This decision was on the lines of Cox v. Burbidge, to the effect that if through a person's negligent keeping of his own fences his horses or cattle stray on to the highway and do injury he is not liable unless they were vicious to his knowledge. The first-mentioned case appears to be one of the latest decided on this subject, and, although the point was a little doubtful, it would now seem that, although liable to a penalty under the Highway Act of 1864 for allowing animals to stray on to the highway, that Act imposes no civil liability in respect of harmless domestic animals trespassing on the highway. It appears to me that your correspondent has confused the liability of owners of cattle straying on the highway to be fined under Section 25 of the Highway Act of 1864 (not Section 5 as quoted by him) with the civil liability of owners."

RECOMMENDED ROUTES.

CARLISLE TO EDINBURGH.—C.J.

Blackford, Longtown (by Scotch Dyke Station), Langholm, Ewes, Hawick, Ashkirk, Selkirk, Galashiels, Buckholm, Stow, Heriot Station, Eskbank, Gilmerton, Edinburgh.

CRAWLEY TO GLOUCESTER.—W.F.H.S.

Crawley, Ifield, Charwood, Leigh, Betchworth, Dorking, Leatherhead, Cobham, Byfleet, Weybridge, Chertsey, Staines, Windsor, Maidenhead, Henley, Nettlebed, Benson, Dorchester, Oxford, Witney, Northleach, Andoversford, Cheltenham, Gloucester.

MANCHESTER TO WENDOVER.—W.N.P.

Manchester, Cheadle, Congleton, Leek, Ashbourne, Derby, Ashby-de-la-Zouch, Ibstock, Hinckley; then along Watling Street, through High Cross to Daventry, down the Holyhead Road, through Towcester, Fenny Stratford, Stony Stratford, Winslow, Whitchurch, Aylesbury, to Wendover.



Sgt. Dalms, commander of the section of Belgian military motor cyclists, nearly fifty years of age, and vice-president of the oldest motor cycle club in Belgium, the Moto Club of Liege. Sgt. Dalms is quite well-known in Halifax, where his family resides, and where he spends all his holidays.

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(C) 2½ h.p. INDIAN Light Twin, opposed cylinders, cradle spring fork, 3 sp.	(C) 4 h.p. A.B.C. , 2-cylinder, horizontal, 3 speed countershaft gear spring frame	—
(A) 3½ h.p. ROVER , T.T., single-cylinder	(B) 2½ h.p. DIAMOND-J.A.P. , Enfield 2-speed gear	—
(A) 3½ h.p. ROVER , T.F. model, with Phillipson pulley, single-cylinder	(B) Model E. 2½ h.p. LEVIS , 2-stroke 2-speed Enfield gear	£47 10
(A) 3½ h.p. ROVER , 3-speed countershaft gear, kick-starter, single-cylinder	(B) Popular. 2½ h.p. LEVIS , 2-stroke	£38 0
(A) 3½ h.p. ROVER , Countershaft 3-speed gear, kick-starter, and coachbuilt Sidecar	(A) 2½ h.p. CALTHORPE , 2-stroke, 2-speed	£46 0
(B) 5-6 h.p. ROVER , twin-cylinder, countershaft 3-speed gear, kick-starter	(B) 2½ h.p. CALTHORPE-J.A.P. , 2-speed, Enfield gear	£46 0
(A) 5-6 h.p. ROVER , twin-cylinder, countershaft 3-speed gear, kick-starter, and Rover coachbuilt Sidecar	(B) Model H. 4½ h.p. B.S.A. , 3-speed, countershaft gear, chain drive	£81 18
(B) 3½ h.p. ARIEL , countershaft 3-speed gear, kick-starter	(B) No. 6. 4½ h.p. JAMES , single-cylinder, countershaft 3-speed gear, kick-starter	£79 0
(A) 8 h.p. War Model MATCHLESS Combination, J.A.P. engine, spring forks, countershaft 3-speed gear, silent chain drive, patent quick detachable wheels, including spare wheel, 3in. tyres on all 4 wheels, kick-starter	(B) No. 6. 4½ h.p. JAMES , single-cylinder, countershaft 3-speed gear, kick-starter, and James coachbuilt Sidecar, complete with apron	£101 10
(A) 2½ h.p. DIAMOND , 2-stroke, single-speed	(B) No. 7. 3½ h.p. JAMES Twin Solo Model, countershaft 3-speed gear, kick-starter	£79 0
(A) Model K. 4½ h.p. B.S.A. , 3-speed, countershaft gear, chain-cum-belt drive	(B) No. 9. 5-6 h.p. JAMES , twin-cylinder, 28×3 tyres, countershaft 3-speed gear, chain drive, hand-controlled clutch, kick-starter	£84 0
(C) 6 h.p. ROYAL ENFIELD Sidecar Combination	(B) No. 9. 5-6 h.p. JAMES , twin-cylinder, 28×3 tyres, countershaft 3-speed gear, chain drive, kick-starter, and James coachbuilt Sidecar, complete with apron	£105 10
(C) 3 h.p. ROYAL ENFIELD , 2-speed	(C) 2½ h.p. BLACKBURN , 2-speed, clutch, and kick-starter, chain and belt drive	£60 0
(C) 2½ h.p. ROYAL ENFIELD , 2-stroke, 2-speed	(C) 4 h.p. BLACKBURN , 3-speed, clutch, and kick-starter, chain drive	£82 0
(C) 6 h.p. A.J.S. Sidecar Combination	(C) 8 h.p. BLACKBURN Sidecar Combination, 3-speed, clutch, and kick-starter, detachable wheels, chain drive	£125 0
(B) 4 h.p. TRIUMPH , 3-speed countershaft	(C) CLYNO.	—
(B) 2½ h.p. JUNIOR TRIUMPH , 2-stroke, 2-speed	(C) ZENITH.	—
(C) 3½ h.p. NORTON , T.T.	(C) CALTHORPE MINOR Light Car.	—
(C) 3½ h.p. NORTON , 3-speed	(C) G.W.K.	—
(C) 4 h.p. NORTON , 3-speed	(C) MORGAN.	—
(C) 2½ h.p. IMPERIAL-J.A.P. , 2-speed		£50 8
(C) 2½ h.p. IMPERIAL-J.A.P. , 2-speed, clutch, and kick-starter		£58 16
(C) 2½ h.p. IMPERIAL , lady's model, 2-speed, clutch, and kick-starter		£60 18

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- We invite enquiries, which shall have our careful attention, and, if need be, advice.

NEW MACHINES FOR WHICH CONTRACTS ARE DEFINITELY FIXED.

	Pr. ce.	Delivery.
ALLON, 2-speed, clutch	£58 0	—
ALLON, 2-speed, clutch, kick-start, de luxe	£65 0	—
A.B.C., 3 h.p. twin	—	Earliest possible.
ARIEL, 3½ h.p., 3-speed	£80 0	Ex stock.
ARIEL 5-6 h.p. 3-speed Combination	—	Earliest possible.
A.J.S. 6 h.p. 3-speed Combination	£126 0	Earliest possible.
B.S.A., 4½ h.p., all-chain	£81 18	Earliest possible.
B.S.A., 4½ h.p., chain-cum-belt	£79 16	Ex stock.
BLACKBURN, 2½ h.p., 2-speed, clutch	£60 0	May.
BLACKBURN, 4 h.p., 3-speed	£80 0	April.
BLACKBURN 8 h.p. 3-speed Combination (spare wheel, £5)	£125 0	May.
CALTHORPE, 2½ h.p., 2-speed, clutch, 2-stroke	£42 0	Ex stock.
CALTHORPE, 2½ h.p., 2-speed, clutch, J.A.P.	£47 5	Ex stock.
DIAMOND, 2½ h.p., 2-speed, 2-stroke	—	January.
DIAMOND, 2½ h.p., J.A.P., Enfield 2-speed, and clutch	—	January.

ENFIELD, 3 h.p., 2-speed, clutch, kick-start	—	Early.
ENFIELD 6 h.p. 2-speed Combination	—	Early.
EDMUND, 2½ h.p. I.A.P., 2-speed, clutch, spring frame	£63 0	Ex stock.
HARLEY-DAVIDSON 7-9 h.p. Combination	—	Earliest possible.
HUMBER, 3½ h.p., flat twin, 3-speed	—	Earliest possible.
HENDERSON, 10 h.p., 4-cylinder	£98 0	April.
INDIAN, all models	—	Earliest possible.
JAMES, 2½ h.p., 2-speed, 2-stroke	£50 0	March.
JAMES, 3½ h.p., twin, 3-speed	£79 0	February.
JAMES, 4½ h.p., 3-speed, solo, £79; Combination	£99 0	January.
JAMES, 5-6 h.p., twin, solo, £84; Combination	£104 0	January.
L.M.C., all models	—	January.
LEVIS Popular	£38 0	January.
LEVIS, Model E, 2-speed, clutch	£52 10	January.
NEW IMPERIAL, 2½ h.p., 2-speed	£50 8	Ex stock.
NEW IMPERIAL, 2½ h.p., 2-speed, clutch	£58 16	January.
NEW IMPERIAL 8 h.p. Combination	£126 0	January.
NORTONS, 4 h.p., 3-speed	—	Earliest possible.
MORGANS, all models	—	Prices on application.
MATCHLESS 8 h.p. Combination	£145 0	January.
O.K., all models	—	Early.
N.U.T., 3½ h.p. twin, 3-speed	£65 0	Earliest possible.
RUDGE-MULTI, T.T., I.O.M. model	—	Earliest possible.
ROYAL RUBY, single-speed, 2-stroke	£40 0	Early.
ROYAL RUBY, 8 h.p., solo, £105; Combination	—	Early.
TRIUMPH, 4 h.p., 3-speed	£85 0	February.
TRIUMPH, 2½ h.p., 2-speed, 2-stroke	£52 10	Earliest possible.
ZENITHS, all models	—	Prices on application.

Our selection of second-hand machines is still the largest in London. Remember our three terms of dealing, of which not one has yet been emulated by any other firm.

- Three days' free trial. Your money back at the end if not satisfied.
- Three weeks' option of exchange. Your machine taken back, and full price allowed, if wished, in exchange for anything else.
- Three months' guarantee—the same guarantee that the makers give.

BRIEF SELECTION FROM STOCK.

ARIEL 1914 3½ h.p. 3-speed Combination	46 gns.
ARIEL 1916 5-6 h.p. 3-speed Combination	75 gns.
BRADBURY 1915 6 h.p. 3-speed Combination	78 gns.
CALTHORPE-J.A.P., 1916, 2-speed, clutch, as new	36 gns.
DOUGLAS 1916 4 h.p. 3-speed Combination, as new	85 gns.
ENFIELD, 3 h.p., 2-speed, 1916	39 gns.
F.N. 1914 5-6 h.p. 2-speed clutch kick-start Combination, as new	69 gns.
HUMBER 1918 6 h.p. water-cooled twin Combination	85 gns.
HENDERSON 1915, 10 h.p., 4-cylinder, Ivy coach Sidecar	85 gns.
INDIAN, 1916, 7-9 h.p., 3-speed, T.T., sporting Sidecar	79 gns.
IVY, 1917, 2-stroke	27 gns.
JAMES, 1914, 4½ h.p., single-speed	32 gns.
LEVIS 1915 Popular	22 gns.

L.M.C., 1915, 4 h.p., 3-speed, good order	47 gns.
MATCHLESS, 1914, T.T., 6-speed	39 gns.
MATCHLESS, 1914, 2½ h.p., T.T.	27 gns.
NEW IMPERIAL, 1915, 2-speed	29 gns.
N.S.U., 1913, 7-9 h.p., 2-speed, clutch	32 gns.
PREMIER, 1913, 3½ h.p., T.T.	27 gns.
QUADRANT, 1914, 4½ h.p., 2-speed, clutch	32 gns.
QUADRANT, 1914, 4½ h.p., 3-speed, clutch	33 gns.
ROVER, 1915, 3½ h.p., T.T., 3-speed	36 gns.
RUDGE-MULTI, 1915, 5-6 h.p. Combination	52 gns.
RUDGE, 1913, T.T., good order	26 gns.
SUNBEAM, 1915, 6-8 h.p., 3-speed, Gloria Sidecar	85 gns.
WOLF, 1916, single-speed, 2-stroke	19 gns.
ZENITH-GRADUA, 1915, 8 h.p., T.T., o.h.v., 90 bore, and underslung Sidecar	72 gns.
ZENITH-GRADUA, 1917, 5-6 h.p., countershaft, Canoclet sporting Sidecar	82 gns.
ZENITH-GRADUA, 1915, 8 h.p., countershaft, solo	65 gns.

(Any machine sent on "The Motor Cycle" deposit system.

RIDER TROWARD & CO., 31, 40b, & 78, High St., Hampstead, N.W.3.

'Phones: Hamp. 5392 and 4904.

Open till 7 p.m. and Sundays.

One minute Hampstead Tube Station.

MISCELLANEOUS ADVERTISEMENTS.

PRICES.

ADVERTISEMENTS in these columns—First 12 words or less 1/6, and 3d. for every two words after. Each paragraph is charged separately. Name and address must be counted. Series discounts, conditions, and special terms to regular trade advertisers will be quoted on application.

Postal Orders sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd., and crossed** & Co.

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.4), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge. Only the number will appear in the advertisement. All replies should be addressed "No. 000, c/o 'The Motor Cycle,' 20, Tudor Street, E.C.4."

DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pays carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged; when under £10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

MOTOR CYCLES FOR SALE.

A.B.C.

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery of the new A.B.C. [2254]

A.J.S.

WE can give immediate delivery from stock of a new 6hp. A.J.S.; price £100.—Below.

1917 A.J.S., 6hp., lamps and horn; £85.—Below.

1916 A.J.S., 6hp.; £80.—Below.

1915 A.J.S., 4hp., semi-T.T. bars; £69.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C.3. [6551]

CROW Bros., Guildford—A.J.S. Agents since 1912. Write us for your requirements. [9777]

A.J.S. Combination, splendid condition, fully equipped; £60.—8, St. Nicholas Rd., Brighton. [1998]

A.J.S. Combination, late 1915, not ridden 700 miles, oversize back tyre; £90.—Parker, Gamblesby, Langwathby, Carlisle. [2066]

A.J.S. 6hp. 1914 Combination, good condition, Lucas lamp; £68; seen by appointment.—Airs, 17, Woodfield Av., Ealing, W.5. [X1752]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery of the new A.J.S. [2255]

ELECTRIC LIGHT

FROM MAGNETO.

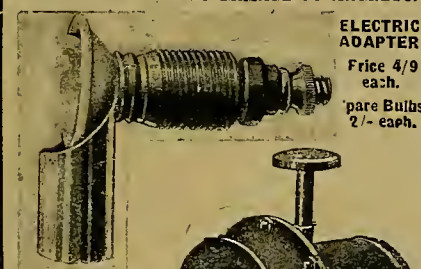


A new method of obtaining light, sufficient for two lamps, from the extra current produced by magneto, which has been wasted so far. As soon as engine starts the lamps light. Perfectly simple and foolproof. No trouble in future to get your lamps lit. An accumulator is fitted into axle for use when machine is at a standstill.

AN UNSOLICITED TESTIMONIAL.

From *The Motor Cycle* of June 13th.
A 3 1/2 h.p. Sidecar Combination Enthusiast.
Recently Maj. Hodgson had his 3 1/2 h.p. Sunbeam sidecar stolen, but fortunately it was soon recovered. "I have," he tells us, "taken a passenger up Birdlip on it on second without a falter, and that was after a long, hot run. It may interest you to know that I have an F.R.S. lighting set run off the magneto. With the exception of the lamps it only cost £2 10s., gives a wonderful light, and is more reliable than any dynamo set I have ever seen."

NO LOSS OF ENGINE POWER. NO DAMAGE TO MAGNETO.



ELECTRIC ADAPTER

Price 4/9 each.

pare Bulbs 2/- each.

This is a small fitting to enable owners of gas lamps fitted with burners of the Rom type (round stem) to make their lamps into electric.

The "adapter" fits over the existing burner with a tight fit, and is connected to an electric wire and battery.

BRITISH HORN
Price 2/6

F.R.S. LAMPS, "BEAM" Works, Pershore Street, BIRMINGHAM.



American Supplies Co. Ltd.
162 Grt. Portland St. London. W.1

MOTOR CYCLES FOR SALE.

A.J.S.

A.J.S.—Immediate delivery latest new 6hp. combination; modern machines taken in exchange.—Parker, Bradshawgate, Bolton. [X1724]

A.J.S. Lightweight, 2 1/2hp., splendid order, powerful, excellent tyres; first £13 gets it.—Brown, Rungmore Village, Burton-on-Trent. [X1800]

A.J.S. and Coachbuilt Sidecar, in smart condition; bargain, £50. Phone Puddington 6018, or apply to 2, Formosa St., Maida Vale. [2012]

LATE 1916 2 1/2hp. A.J.S., T.T. model, 3-speed, lamps, etc., new condition, little used; £45, bargain.—Thorpe, Whitehorse Rd., Thornton Heath, S.E. [1947]

6hp. A.J.S. Twin, 2-speed countershaft, all-chain drive, kick starter, sound order, sidecar; £55.—Paterson, 7, Percival Parade, Worcester Park, Surrey. [1994]

PRACTICALLY New 1918 A.J.S. 6hp. Combination, fully equipped, wind screen, hood, spare wheel, mechanical horn; bargain, £120.—Alson, 49, Kirkgate, Wakefield. [X1565]

1916 A.J.S., 2 1/2hp., 3 speeds, Watford speedometer, Binks, lamps, horn, perfect order, enamel and tyres good, 4,000 miles; 55 gns.—Chaplain, Manor House, Felixstowe. [2183]

1916 A.J.S. 4 1/2hp. Combination, sidecar, canoelet, S.B., perfect condition, Lucas accessories, all on; first cheque for £75 secures same, no offers.—R. A. Griffith, 7, Union St., Swansea. [X1566]

A.J.S.—For the earliest possible deliveries of 1919 models, advance specifications and super service, try the A.J.S. Specialists, The Walsall Garage, Wolverhampton St., Walsall. Phone: 444. [X1025]

A.J.S., 2 1/2hp., 1914, 2-speed hand-controlled clutch, chain drive, Lucas lamps, Stewart, little used, just year, 35 gns. Or exchange with cash for combination. Enfield preferred.—Wilmoth, 82, Fallow Court Av., North Finchley, N. [1984]

A.J.S. spares; prompt delivery.—Cyrii Williams, Chapel Ash Depot, Wolverhampton. [9189]

Alldays.

ALLDAYS Matchless, 2 1/2hp., 2-stroke, 3-speed gear, clutch, perfect order guaranteed; bargain, £22/10.—Newton, 58, Sussex Rd., Southport. [X1652]

ALLDAYS Allon, 2 1/2hp., 2-stroke, new 1918, 2-speed, clutch, sidecar, lamps, etc., not been ridden 100 miles, as new; £53.—Bone, 72, Upper Tulse Hill, S.W. [2149]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery 2-speed and clutch Allons, £58; also De Luxe models, with kick start, £65. [2258]

ALLDAYS 2 1/2hp., 2-stroke, 1916, in good running order, very easily controlled, splendid value; £17; just the bike for a beginner. Write or phone appointment.—Mansfield, 73, Powerscroft Rd., E.5. [1939]

ALLDAYS Allon, 5-6hp., twin 2-stroke, 3-speed countershaft, clutch, kick start, footboards, T.T. bars and sporting sidecar, Lucas dynamo lighting and horn, finished red, very sporting outfit; £100.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C.3. [0492]

Antoine.

4hp. Antoine, low frame, drop back, adjustable pulley, less magneto, carburettor; quick sale, £7; good tyres, belt; bargain.—96, Greyhound Rd. [2179]

Ariel.

1916 6hp. Ariel Combination; £75.—Ross, 86, High Rd., Lee. [2035]

RIDER TROWARD and Co., 31, High St., Hampstead.—New 3 1/2hp. 3-speed Ariel in stock, £20. Orders being booked for earliest delivery 5-6hp. combination. [2257]

ARIEL 1916 3 1/2hp. Combination, original tyres, 70 gns.; also 1917 combination, £79/10; heap accessories on both; exchanges arranged.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [2085]

Bat.

4hp. Bat, lamp, horn, tools, excellent condition; £20.—Hock, Little London, Stroud, Gloucestershire. [2148]

1913 Bat-Jap, 8hp., with tradesman's side-carrier, sound throughout, new engine 1916; £40.—Hughes, Taulan, Bettws-y-Cced. [1989]

BAT-JAP, C.B. Combination, 8hp., 2-speed countershaft, kick start, B. and L. Bosch, running order; £27/10.—20, Church Hill, Aldershot. [2021]

1915 6hp. Bat-Jap, 3-speed, kick start, coachbuilt sidecar, wind screen, spring frame, electric lighting set, in good condition; £70.—Apply, F. Dillway, 47, Larden Rd., Acton. [2077]

Blackburne.

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery of new Blackburnes; 2 1/2hp., 2-speed, clutch, £26; 4hp., 3-speed, £80; 8hp. combination, £125, or with spare wheel £130. [2256]

MOTOR CYCLES FOR SALE.

Bradbury.

1912 Bradbury, 4h.p., recently overhauled; £21.—Cross, Effingham Sq., Rotherham. [X1783]
BRADBURY, 1912, 4h.p., Bosch mag., B. and B. carburettor, N.S.U. gear, Villiers clutch, both in perfect order, stored 2 years, wants tuning only; £20.—Maggs, Pangbourne, Berks. [X1693]

Brown.

3½ h.p. Brown, U.H., Whittle, Druids, lamps, etc., 2 good condition; £14.—76, Neate St., Camberwell, S.E.5. [X1650]

B.S.A.

B.S.A., 3-speed, 1919 models in stock.—Reys, 378, Euston Rd. [1308]

1919 B.S.A.—Early deliveries at Briggs, Motor Agent, Wellingborough. [X0120]

NEW B.S.A.'s in stock; immediate delivery Model K.—Alexander, Agent, Wulasey Village. [1506]

1913 3½ h.p. 2-speed B.S.A., enamel, plate, new condition, accessories; £27/10.—Stratton, 16, Worthing Rd., Basingstoke. [X1755]

B.S.A., 1917, chain and belt drive model, in new condition, had very little use, lamps and horn; £68.—Mason, Motors, Letchworth. [2195]

1919 B.S.A. Models, 78 gns. and 76 gns.; sidecar 28 gns.; immediate delivery.—Wallace Batchelor, Clarence St., Kingston. Tel.: 1809. [1463]

B.S.A. and Sidecar, 2-speed, 3½ h.p., requires new piston, otherwise in good condition; seen any day; what offers?—Lloyd, Bamfurlong, near Wigan. [X1799]

B.S.A., 1916½, 3-speed model K., lamps, speedometer, O.B. sidecar, wind screen, all as new; 55 gns., bargain.—H. Billingsley, Caldecote, Towcester, Northants. [1938]

WE can give immediate delivery from stock of the new B.S.A. chain-cum-belt; price £79/15.—Elice and Co., 15-16, Bishopsgate Av., Camomile St., E.C.3. [0552]

B.S.A. 1916 4½ h.p. Combination, with head, rear, and sidecar lamp sets, horn, wind screen, etc., exceptionally good condition; 70 gns.—Parker's, Bradshawgate, Bolton. [X1725]

B.S.A.—For the earliest possible delivery of 1919 models, advance specifications and prices, sole district agents, The Walsall Garage, Wolverhampton St., Walsall 'Phone: 444. [X0126]

RIDER TROWARD and Co., 31, High St., Hampstead.—New 4½ h.p. B.S.A., chain-cum-belt, in stock, £79/16. Orders being booked for earliest delivery chain drive model, £81/18. [2259]

B.S.A., all-chain model 78 gns. and belt-cum-chain model 76 gns.; also best B.S.A. sidecar, 28 gns.; actually in stock; exchanges arranged.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green N. [2081]

1916 B.S.A. Model K. Combination, 4½ h.p., chain-cum-belt, 3 speeds (details in all respects similar to 1919 model), wind screen, luggage grid, Lucas seleno lamps and horn, 30 gns. speedometer, accessories, spare, tyres in good condition, one new Dunlop, two retreads, mileage 6,000; £90. can be seen any evening after 7, or by appointment; present day cost of similar outfit over £150.—Taylor, 18, Northwood Rd., Stanstead Rd., Forest Hill, S.E.23. [2253]

Calcott

CALCOTT, 2½ h.p., single speed, adjustable pulley, a handsome mount; £20, or part exchange for powerful combination.—Apply, Keeping, 45, Ivor Rd., Hemworthy, Dorset. [X1669]

Calthorpe.

1915 Calthorpe, 2-stroke, 2-speed, excellent running order; £23.—Thorpe, Whitehorse Rd., Thornton Heath, S.E. [2252]

1915 2½ h.p. T.T. Calthorpe-Jap, fitted with 2 speeds and free engine, enamelled red, very sporty; 25 gns.—30, Talbot St., Bursley. [X1661]

CALTHORPE Motor Cycles.—All models in stock for immediate delivery; no permits required.—P. J. Evans, 91, John Bright St., Birmingham. [0955]

2½ h.p. Calthorpe-Jap, 1918 model, single speed, excellent condition, run under 500 miles, lamps, horns, etc.; £30.—Box 2,611, c/o *The Motor Cycle*. [X1539]

CALTHORPE Junior, 1914, 2h.p., 2-speed, free engine, new lamp set, overhauled, ready to ride away; £18/10, or exchange for higher power.—14, Kildoran Rd., Acre Lane, Erixton. [2142]

Campion.

1916 Campion, 2½ h.p., 2-speed, all new condition, new Dunlop tyres; £23 or exchange with cash for ch.p. combination with sidecar, B.S.A. or Matchless preferred.—A. H. Eland, Mount Olivet, Louth, Lincs. [X1774]

Centaur.

CENTAUR Lightweight, twin 3h.p., splendid condition, all accessories; £24.—215, Kingston Rd., Wimbledon, S.W.19. [1942]

Chater-Lea.

8 h.p. Chater-Lea, coachbuilt sidecar, 3 speeds, gear box, clutch, chain drive, handle starter, lamps, speedometer, etc.—10, Limes Rd., Weybridge. [2160]



JANUARY DELIVERIES.

P. & M.

B. S. A.

JAMES

ROVER

LEVIS

NORTON

TRIUMPH

MATCHLESS

NEW IMPERIAL

ROYAL ENFIELD

WE are now booking orders for execution in strict relation, and fully expect deliveries of all the above makes during the present month. We quote highest prices for allowances on your present mount, and easy payment terms if desired.

SECOND - HANDS.

RUNABOUTS AND CARS.

MATHIS, 1914, 8 h.p., 3-seater, clover leaf.

MORGAN, 1916, de luxe, J.A.P. water-cooled.

PHENIX, 1913, 11.9 h.p., 3-seater, and dickey.

STELLITE, 1914, dickey seat.

ENFIELD, 1915, dynamo lighting.

G.W.K., 1915, standard like new.

CALCOTT, 1916, dynamo set.

FORD, 1914, 4-seater. Low price.

SIDECAR COMBINATIONS.

MATCHLESS, 1915, 8 h.p., M.A.G., dynamo £115

NORTON, 1916, 4 h.p., Norton Sidecar £100

A.J.S., 1916, 6 h.p., 3 speeds £100

P. & M., 1914, 3½ h.p., wicker Sidecar, as new £60

A.J.S. 1915 6 h.p. Combination £100

A.J.S., 1915, 6 h.p., and Sidecar £100

HARLEY-DAVIDSON 1915 7-0 h.p. Comb. £100

ROVER 1918 3½ h.p. Comb., almost new.. £100

SOLO MACHINES.

ENFIELD, 1912, 2½ h.p., 2-speed, chain-drive £20

DOUGLAS, 1914, 2½ h.p., 2-speed, nice order £36

DOUGLAS, 1915, T.T., 2½ h.p., 2-speed ... £45

RUDGE, 3½ h.p., 1913, fixed gear, very fast £20

REGAL, 1914, 2 speeds, all accessories ... £36

P. & M., 1914, 3½ h.p., 2 speeds, kick-starter £48

TRIUMPH, 1914, 2½ h.p., Junior, 2 speeds .. £40

TRIUMPH, 1908, requires repairs £25

Fuller particulars of any above post free with pleasure.



100, Gt. Portland St.
LONDON, W.1.

Telephone: Mayfair 552.

Telegrams: "Abdicate, Wesdo, London."

MOTOR CYCLES FOR SALE.

Chater-Lea-Jap.

CHATER-LEA-J.A.P. Combination, 8h.p., 3-speed countershaft gear, foot clutch, all chain drive; seen running; price £35.—21, Newton Av., Acton, W. [2015]

CHATER-LEA-J.A.P. (1916) 6h.p. Twia, 3-speed, free engine clutch, variable pulley, T.T. bars, lamps, speedy, excellent condition; exchange 1916 Douglas or New Imperial De Luxe, sell £50.—1440, Portway, E.15. [1970]

Clyno.

CROW Bros., High St., Guildford, West Surrey agents for the 1919 Clyno. Order now to ensure early delivery. [1553]

6 h.p. Clyno, 2-speed, kick-starter, all-chain drive, and large sidecar, mechanical horn, etc.; a snip, £35.—Davis, 43, Shern Hall St., Walthamstow, E.17. [2212]

Connaught.

1916 Connaught 2-stroke, not done 200 miles, unscratched; a beauty; £25.—19, Wilcox Rd., South Lambeth, London, S.W.8. [2221]

Diamond.

DIAMOND, 1915, 2½ h.p. (4-stroke), 2-speed countershaft, enclosed chain drive, handle-bar clutch, just completely overhauled, relushed, and new Avon tyre fitted, excellent order.—Hammerton, 87, Merridale Rd., Wolverhampton. [X1789]

Douglas.

1915 4h.p. Douglas; £52.—Ross, 86, High Rd., Lee. [2037]

NEW Douglas in stock shortly at Gourlays, Fallowfield, Manchester. [1781]

1914 3½ h.p. Douglas, O.B. sidecar; £54.—Ross, 86, High Rd., Lee. [2036]

1917 Douglas, 3-speed countershaft gear; £52/10.—J. Ritchie, Macduff. [X1691]

1912 Douglas, Stewart horn, etc.; £28.—Parker and Son, St. Ives, Hunts. [1972]

DOUGLAS, W.D., October, 1915, hardly used; 35 gns.—23, Sheldon Rd., Edmonton. [2024]

DOUGLAS, 3-speed, Colonial model, as new; £48.—51, Maplethorpe Rd., Thornton Heath, S.E. [2187]

DOUGLAS, 1914, 2½ h.p., speedometer, lamps, etc.; £38.—619, Garratt Lane, Bartsfield, S.W.18. [2245]

DOUGLAS Motors.—Earliest deliveries, all models. Book yours now.—Briggs, Motors, Wellingborough. [X0492]

DOUGLAS, T.T., long exhaust, exceptionally fast, 1913, new tyres; £33.—S. St. Nicholas Rd., Brighton. [2001]

DOUGLAS in Stock, 4h.p. combination. £95. War Office 2½ h.p. model, £60, new.—Moffat, Yeovil 'Phone: 50. [1103]

DOUGLAS, 1915 (late), 2½ h.p., 2-speed, T.T., accessories; £42.—Lt. Disney, R.A.F., Rossie, Kingston Hill, Surrey. [2195]

DOUGLAS, 1915-16, 2½ h.p., 3-speed gear, heavy non-skid tyres, excellent condition; £45.—Parker's, Bradshawgate, Bolton. [X1521]

IMMEDIATE Delivery of Douglas military models; 2½ h.p. £60, 4h.p. £75.—Gibb, Douglas Expert, Gloucester. 'Phone: 852. [4749]

DOUGLAS War Models, new 4h.p. 3-speed combination £95; 2½ h.p. 2-speed £60.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [2060]

BEST Deliveries of 1918 Douglas models, also spares, by the man on the spot, Eli Clark, the pioneer agent, wholesale and retail, Cheltenham Rd., Bristol. [0968]

DOUGLAS, late 1915, T.T., 2-speed model, in excellent condition; bargain, £42/10.—Longman Bros., 2, King's Parade, Acton Hill. 'Phone: 1578 Chiswick. [2118]

1916 Douglas, 2½ h.p., lamps, horn, tools, etc., splendid order, 40 gns.; 1914 ditto, ready to ride anywhere, 34 gns.—Fitt, Barossa Terrace, Church St., Chelsea. [2162]

1915 2½ h.p. Douglas, 3-speed, footboards, touring or semi T.T. bars, engine overhauled recently, good reliable machine; £37/10.—Robinson's Garage, Green St., Cambridge. [2093]

1913 2½ h.p. Douglas, 2-speed, slight drip feed, lamps, horn, new tyres, belt, and chain, machine in splendid condition; £28/10.—Goodey, Gisleburne Rd., Wellingborough. [X1568]

DOUGLAS 2½ h.p., late 1913, but with several late improvements; 2-speed, clutch, kick start, splendid condition; first with cash £40 secures.—12, Elm Gardens, Hammersmith. [2097]

VERY Nice 2½ h.p. Douglas, 1916, standard type, 3-speed gear, speedometer, lamps, horn, original tyres, excellent condition; price £50.—Reffell, Novar, Earlswood Rd., Redhill, Surrey. [X1803]

2½ h.p. Douglas, 1913, Colonial 2-speed model, footboards, Bosch magneto, Lucas horn, lamps, carrier, etc., ready for road; £27/10, offers.—Wyatt, Yattendon, Newbury, Berks. [2168]

DOUGLAS, 1913, 2½ h.p. Colonial model, on original tyres, not ridden much, speedometer, horn, new spare parts, tools, lamps, new spare Service belt; £48.—Box L8,427, c/o *The Motor Cycle*. [2011]

1914 2½ h.p. Douglas, 2-speed, footboards, touring or T.T. bars, Bosch mag., engine just overhauled, exceptionally good machine, carefully used; £32/10.—Robinson's Garage, Green St., Cambridge. [2092]

MOTOR CYCLES FOR SALE.

Douglas.

1916 Douglas, 2½ h.p., W.D. model, 3-speed, kick starter, accessories, delivered Aug., 1916, stored since Dec., 1917; price £45.—Apply (for address to view) to Captain Humphrys, 30, Victoria Rd., Kensington. [2002]

LATEST Typa Douglas, brand new, only done 100 miles, every accessory, also leather kit with new belt, two new tubes, and Dunlop tyre; cost over £90, sacrifice £70.—Top Floor, 122, New Kent Rd., S.E. (After 5 p.m.) [2247a]

DOUGLAS Motor Cycle, 1911, in good mechanical condition, Bosch mag., Lucas head lamp and generator, tail lamp, tyres, belt, and enamel good, has just had new front and back mudguard fitted, fixed gear; not sent on approval; first £10 secures, no offers.—Loder, The Elms, Bishops Waltham. [2240]

1916 Douglas, 2½ h.p., 2-speed, All-black W.D. model, with front mudshield, mileage 3,000, original tyres, 2 P. and H. lamps, generator, horn, mirror, exhaust, jacket, Amac, 2 toolbags, very carefully used, engine absolutely perfect; £49.—Douglas, 20, Harley Terrace, Gosforth, Newcastle-on-Tyne. [X1562]

23 h.p. Douglases, brand new, in stock, immediate deliveries, fitted 3-speed gears, touring or semi T.T. bars, footboards or footrests, £60; two best lamp sets, horn, registration, writing number plates, £4 extra. Enquiries invited. Full specification by post.—Douglas specialists, Robinson's Garage, Green St., Cambridge. [2091]

4 h.p. W.D. Douglases, brand new, in stock; immediate deliveries; fitted 3-speed gear, clutch, kick start, £75; with Douglas coachbuilt sidecar, £95; three best lamp sets, horn, registration, writing number plates, £5/10 extra. Enquiries invited. Full specification by post.—Douglas specialists, Robinson's Garage, Green St., Cambridge, T.A.: Bicycles, Tel.: 388. [2090]

DOUGLAS, Douglas, Douglas.—We have had four years with Douglas motor cycles under active service conditions. Our experience and advice are at your disposal. We can supply a few of the famous All-Black Douglas from stock. Guaranteed early delivery of a limited number of all 1919 models. If you are interested in Douglas machines, call and see us.—Vivian Hardie, Ltd., Douglas Experts, 24, Woodstock St. (off Oxford St.), Bond St., London, W.1. [0978]

Enfield.

1916 Enfield, 3 h.p., 2 speeds, complete lamps, etc.; £47.—Cross, Jeweller, Rotherham. [X1780]

ENFIELD, all models, early deliveries.—J. A. Stacey, Sole Agent, 12, Ecclesall Rd., Sheffield. [X1543]

ENFIELD 6 h.p. Combination, 1915, new condition; £72.—51, Maplethorpe Rd., Thornton Heath. [2136]

ENFIELD Coach Combination, very powerful, good condition; £50.—243, Drakefell Rd., Brockley. [2169]

1919 Enfields; combination 110 gns., 2-stroke 50 gns., 3 h.p. twin 65 gns.; immediate delivery.—Wallace Batchelor, Clarence St., Kingston. Tel.: 1809. [1464]

ENFIELD Combination, 6 h.p., splendid condition, accessories and spares; £69.—215, Kingston Rd., Wimbledon, S.W.19. [1943]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries Enfields, all models. [2261]

1916 Enfield, 2-speed, 2-stroke, splendid condition, lamps, horn, speedometer; £30.—Rogers, Newington Terrace, Claven Arms, Shropshire. [X1563]

3 h.p. Royal Enfield Twin, 2-speed, chain drive, new July 14th, 1917; owner giving up; as new; £50.—F. W. Matthews, Plant Farm, Fitchwick, Beds. [1966]

LATE 1916 6 h.p. Enfield Combination, hood, screen, luggage grid, lamps, horn, done 1,000 miles, like new; £88.—Lent, Moulds, 36, Gourock Rd., Egham S.E. [2053]

ENFIELD 6 h.p. Combination, with Lucas dynamo lighting, extra heavy oversize tyres, engine recently overhauled; any trial; £100.—Parker's, Brodshawgate, Bolton. [X1518]

3 h.p. Enfield Twin, run under 1,000 miles, new condition, including tyres; nearest offer to £50 for immediate sale.—Masterton, 41, Somerton Rd., Cricklewood, N.W. [1887]

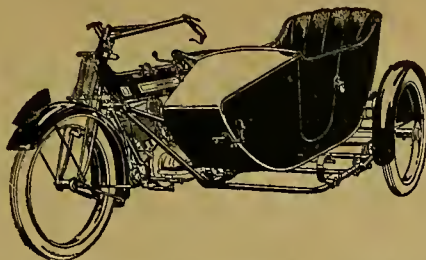
ENFIELD, 2½ h.p., chain drive, single speed, in good condition and running order; £20, or exchange with cash for higher power.—Hitchings, Piccadilly, Hanley, Staffs. [X1697]

ENFIELD 1916 3 h.p. Twin, 2-speed, kick start, semi T.T., Palmer cord, Thomson-Bennett, Powell and Hammer ebony lamp set, Spartan horn; £36.—R. Smith, Burrough, Melton Mowbray. [X1813]

ENFIELD Coachbuilt Combination, late 1913, 6 h.p., J.A.P., 3-speed, handle starting, speedometer, lamps, horn, etc.; £58.—Seen at Butterworths' Garage, 64, Mill Lane, Brixton Hill. [2133]

1917 6 h.p. Enfield Combination, Lucas lamps and horn, little used, and in splendid condition; 85 gns., no offers; seen by appointment only.—Johnson, New Hall, Stocksbridge, Sheffield. [1948]

1916 Enfield Combination, hood and screen, driven under 2,000 miles, delivered from makers July, 1916, in perfect condition; lowest £85.—Bamuz, The Cottage, San Remo Parade, Westcliff-on-Sea. [1909]



The 6 h.p. ROYAL ENFIELD Combination.

Seek My advice—

Now that you can buy your motor cycle—restrictions free—is the time to have my assistance in choice.

I am happily in a favourable position to supply any of the undernoted well-known makes, and, in regard to particular needs, my experience enables me to guarantee your being fully suited.

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I invite your inspection and examination of the latest models I now have on view, and am ready to furnish all information regarding latest developments in design.

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John Bright St.,
BIRMINGHAM

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R.H.S.

MOTOR CYCLES FOR SALE.

Enfield.

ROYAL Enfield, 3 h.p. twin, 2 speeds, kick start, lamp, speedometer, footboards, 1914 model, not used last 18 months, condition perfect; £35, no offers.—Write Armstrong, Morecambe Hotel, Morecambe, Lancs. [X1532]

ENFIELD Dynamo Model, in exceptional condition, £105; another, 8 h.p., plain model, in fine condition, here; 1919 expected soon. Book up to secure.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [2083]

1916 Royal Enfield, 3 h.p. twin, excellent condition throughout, owner active service, not used 12 months, lamp, speedometer, horn, original Palmers; £45, or exchange with cash for combination.—Moulton, 68, Lawrence Rd., Wavertree, Liverpool. [X1528]

3 h.p. T.T. Enfield, new October, 1916, mileage under thousand, guaranteed perfect condition throughout and unscratched, very fast, strongly built; Wrexham district; £50, including lamps, horn, speedometer, leg shields, spare chain.—Box L2,646, c/o The Motor Cycle. (D) [X1784]

ENFIELD 1916 6 h.p. Combination, equipped with 3 lamp sets, Lucas horn, speedometer with trip, wind screen, spare tube, sundries, tip-top condition throughout, 90 gns.; also 1915 ditto, with Lucas dynamo set, wind screen, extra heavy tyres, £95.—Parker's, Brodshawgate, Bolton. [X1731]

23 h.p. Enfield, frame, spring forks, wheels, mudguards, carries saddle, handlebars, everything except engine, excellent condition, £5; also 2½ h.p. New Hudson, drop back, frame, spring forks, saddle, mudguards, stand, fitted with J.A.P. engine, B.B. carburetter, magneto, £7/10, or exchange.—T. Shubert, Ivy Cottage, Adderbury, Banbury, Oxon. [2125]

Excelsior.

1916 Excelsior, 7-9 h.p., 3-speed gear box, tradesman's box attached, in first-class condition; any trial; price £70.—Apply, 219, Glyn Rd., Clapton, E.5. [X1512]

F.N.

2 h.p. F.N. Senspray, U.H. mag., overhauled, all in very good condition, complete with lamp, horn, pump, tools; £16.—22, Cannon Rd., Ramsgate. [X1559]

F.N., 5-6 h.p., 4-cyl., clutch model, first-class condition, new sidecar body; seen Sundays; trial given; 21 gns., good bargain.—96, Greyhound Rd. [2180]

Harley-Davidson.

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new Harley-Davidsons. [2262]

HARLEY-DAVIDSON 1916 Combination, electric lighting, 3-speed, hand and foot clutch, excellent condition; 80 gns.—53, Highfield Rd., Luton. [X1654]

HARLEY-DAVIDSON, late 1915, 11 h.p., 3-speed, Montgomery coachbuilt sidecar, speedometer, etc.; cost £120, accept £85.—104, The Parade, Leamington Spa. [X1834]

7 h.p. Harley-Davidson, electric model, Mills-Fulford coachbuilt sidecar, speedometer, etc., run under 1,000; recently cost £150; open to good offer.—Box L8,468, c/o The Motor Cycle. [2236]

HARLEY-DAVIDSON, 1917 mag. model, and H.D. sidecar, £120; also 1915 electric model, and sidecar, £75; exchanges.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [2084]

HARLEY-DAVIDSON, 1916, 7-9 h.p., Gloria No. 3 sidecar, light car tyres, as new, electric lighting, dynamo, speedometer, mechanically perfect, spare accumulator, and wind screen; £95.—Fred B. Page, Leamington, Wellingborough. [X1651]

HARLEY-DAVIDSON 1915 7-9 h.p. Combination, very fast, excellent condition, coachbuilt sidecar, screen, 3 lamps, 2 generators, speedometer, horn, practically new tyres and chains, tools, lots of spares, including 3 inner tubes; £75.—Horton, 8, West Chisenbury, Pewsey, Wilts. [1962]

Hazlewood.

HAZLEWOOD-J.A.P. Combination, 1916, 6 h.p., 3-speed, kick start, hood, luggage grid, a luxurious outfit; £100, or exchange Ford—Malrosa, 1, Kenlor Rd., Tooting, London. [2131]

Henderson.

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new Hendersons; price about £98; delivery about April. [2264]

Hobart.

1916 Hobart-Villiers, 2½ h.p., 2-stroke, 2-speed gear, new Dunlop tyres, lamps, etc.; £32/10, a bargain.—25, Arngask Rd., Catford, S.E.6. [1985]

H.S.M.

1915 8 h.p. H.S.M., 3-speed, H.S. and clutch, hood, screen; £60.—86, High Rd., Lee. [2038]

Humber.

HUMBER, 1912, 3½ h.p., 2-speed, handle start, condition as new, with wicker sidecar.—Tucker, Leigh, Westbury, Wilts. [1997]

HUMBER, 1913, 3½ h.p., 2 speeds, handle starting, Bosch, B. and B. Druids, and coachbuilt sidecar; £36.—Jarrett, 130, Bunhill Row, E.C. [2026]

MOTOR CYCLES FOR SALE.

Humber.

1914 3½ h.p. Humber, 2 speeds, free engine, £25; or exchange lightweight.—A. R. Stamford, 24, Lewin Rd., Streatham Common, S.W.16. [2156]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery new 3½ h.p. and 6 h.p. flat twin Humpers. [2265]

HUMBER New Pattern Flat Twin, 3-speed, with lamps, horn, and speedometer, very little used; £65.—Apply, Saw Mills, Dunhill Rd., Earlsfield, S.W. [2049]

1918 3½ h.p. Humber, horizontal opposed twin engine, 3-speed clutch, handle starting, with coachbuilt Ivy sidecar, 2 lamp sets, mechanical horn, luggage grid, ridden 500 miles only, really brand new; £75.—Robinson's Garage, Green St., Cambridge. [2194]

Indian.

1915 5 h.p. 3-speed Indian Sporting Combination; £63.—86, High Rd., Lee. [2042]

INDIAN.—Early delivery assured by placing your order with Parker's, Bradshawgate, Bolton. [X1523]

1915 7.9 h.p. Indians, Colonial Models; £45 solo, £55 combination.—Ross, 86, High Rd., Lee. [2039]

1915 7.9 h.p. Indian (Canadian), spring frame, overhauled; £43.—53, Brownhill Rd., Catford. [2104]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery new Indians. [2263]

INDIAN 3½ h.p. Twin, 1915, stored 2 years, clutch, 3-speed, excellent mechanical condition, and solo; £40, first cheque, bargain.—Beer, Vobster, Bath. [X1694]

INDIAN, 7 h.p., 1913, 2-speed, clutch, kick starter, handsome coachbuilt sidecar, like new, lamps, tools, spares; £50.—Box L8,427, c/o The Motor Cycle. [2010]

1915 7.9 h.p. Indian, 3-speed, clutch, kick start, with coach sidecar and all accessories, in excellent order; £75.—Robinson's Garage, Green St., Cambridge. [2094]

1915 Indian 5.6 h.p. Combination, 3-speed, k.s., sporty torpedo sidecar; £60, or part exchange last solo.—S.J.F., 2 Russell St., Brixton, S.W.9. [2155]

1915-16 Indian Combination, 3-speed, 7.9 h.p., spring frame, electrical equipment, all in splendid condition.—Apply, Elm Villa, Boyne Valley Rd., Maidenhead. [X1696]

1916 5.6 h.p. Indian, 3 speeds, countershaft, clutch, kick start, speedometer, new condition, only done 900 miles; £65.—Box L8,467, c/o The Motor Cycle. [2235]

1914 Indian 2-speed Combination, as good as one of this year's, unscratched, low mileage, electric lamps, fully equipped; £50.—19, Wilcox Rd., South Lambeth. [2220]

1914 Spring Frame 7.9 h.p. Red Indian, clutch model, perfect running order, fast and powerful machine; offers wanted.—Rawlinson, Oxford St., Langdon Hills, Essex. [2069]

1914 7.9 h.p. Clutch Indian Combination, new tyres, lamps, spares, Klaxon, disc wheels, and 24 gn. Bramble sidecar, wind screen, and hood; expert examination; £45; deposit forfeited last week; 168, Southgate Rd., Islington, N.1. [2173]

INDIAN, T.T., 1914, 2-speed, kick starter, electric horn and lighting system, luxurious coachbuilt sidecar, whole turnout little used, and in excellent running order; £60.—Miller-Johnstone, Rashall Lodge, near Pewsey, Wilts. [X1534]

7.9 h.p. Indian, 2-speed, spring frame, 1915 model, hand and foot clutch, road race bars, machine sold new by Godfrey's about 3 months ago and only ridden 300 miles, green enamel; £65. [2173]

7.9 h.p. Indian, similar specification as above, but ordinary touring bars, ex-Government machine; £48.—Mason, Motors, Letchworth. [2197]

INDIAN, 1914, 7.9 h.p., 2-speed, free engine clutch, spring frame, Phoenix torpedo sidecar, lamps, tools, spares, unused for two years, overhauled, new tyres; any examination; £60, or near offer.—Sheppard, 41, Lichfield Rd., Stafford. [X1808]

VERY Fast 1916 Powerplus Indian, 7.9 h.p., 3-speed, hand and foot control clutch, T.T. bars, does 40 m.p.h., complete with lamps, speedometer, etc., original tyres, all in good condition; price 70 gns., or part exchange lower powered machine.—Brown, 16, Broad St., Ross-on-Wye. [X1770]

Ivy.

IVY 2-stroke, 2-speed countershaft, C.A.V., good mechanical order, £20; Dixie lightweight magneto, 35/-; Dixie 50" twin, 90/-.—Grocer, 25, Frederick Rd., Custom House, E. [2030]

Ixon.

1918 Ixon, 2-stroke, not done 500 miles, complete with lamps, horn, pump, and spares; any reasonable trial; £23/10, no offers.—Box 2,625, c/o The Motor Cycle. [X1614]

James.

1914 3-speed James, C.B. sidecar, new condition; £50.—86, High Rd., Lee. [2040]

4 h.p. James, 3-speed countershaft, K5, wants parts and repairing; £18; appointment.—53, Brownhill Rd., Catford. [2103]

THIS WEEK'S OFFER.

Latest Model TRIUMPH,

3-speed gear, countershaft,

Price £85.

Also the following NEW machines, all of which can be supplied without permits:

V Model MATCHLESS and Sidecar, 8 h.p. . . .	£140 0
A.J.S., 6 h.p., and Sidecar, with lamps and horn. .	£133/16
ROVER, 3½ h.p., 3-speed . .	£97/10
B.S.A., 4½ h.p., all chain . .	78 gns.
B.S.A., 4½ h.p., chain-cum-belt	76 gns.
NEW IMPERIAL, 2½ h.p., 2-speed.	48 gns.
LEVIS, 2½ h.p., 2-speed . .	£47/10

JULIAN, 84, Broad Street,

READING.

Biggest Light Car and Motor Cycle Dealer in the South.

Phone: 1024.

48 years' reputation.

Closed Wednesday 1.

MOTOR CYCLES FOR SALE.

James.

RIDER TROWARD and Co., 31, High St., Hampstead.—James machines. Delivery this month new 5.6 h.p. twin combination, £104; 4½ h.p. solo, £79; combination, £39; delivery February, 3½ h.p. twin, £79; March, 2½ h.p. 2-stroke. Orders accepted in strict rotation. [2267]

J.A.P.

RIDER TROWARD and Co., 31, High St., Hampstead.—Calthorpes, 2½ h.p., 2-stroke, 2-speed, 40 gns.; 2½ h.p., J.A.P., 2-speed, 45 gns.; immediate delivery. [2260]

10 h.p. J.A.P. 1,100cc. W.C. 50° Engine, latest model, induction, water and exhaust pipes, Bosch magneto, drive and case, Chater plate clutch, Chater 3-speed gear, all new; £57/10.—Teviot, Longbridge Rd., Barking. [2098]

Kelecom.

2½ h.p. Kelecom, less mag.; £12, offers.—B., 76, 4 Grange Walk, Bermondsey. [X1535]

Lea-Francis.

LEA-FRANCIS Combination, 3½ h.p. J.A.P. engine, kick start, 2 speeds, clutch, handsome turn-out; £45.—7, Mason's Av., Wealdstone, Middlesex. [2204]

Levis.

1915 2½ h.p. Levis, lamps, spare belt, excellent condition; £26.—Jas. Ettles, Keith. [X1653]

LEVIS, 1916, Lucas lamp, horn, new tyres; £24, close offer for quick sale.—8, St. Nicholas Rd., Brighton. [1999]

LEVIS Popular, 2½ h.p., 2-stroke, on the roads daily, L equipped throughout; £20.—23, Weston Park, Crouch End, N. [1937]

LEVIS, 1915, 2½ h.p., single-speed, complete, tools, lamps, horn, in very good order; £22/10.—76, Victoria Rd., Harlesden, N.W.10. [2145]

LEVIS, 1915, 2½ h.p., 2-speed, splendid condition, only done 2,000 miles; £26/10, or offer.—Letters only to Max, 112, Colomb St., East Greenwich, S.E.10. [2034]

RIDER TROWARD and Co., 31, High St., Hampstead.—Levis. Delivery this month, Model E, 2-speed, clutch, £52/10; Popular, £38. Orders being booked in strict rotation. [2268]

LEVIS.—For the earliest possible delivery of 1919 L models, advance specifications of all models, sole district agents, The Walsall Garage, Wolverhampton St., Walsall. Phone: 444. [X0127]

LEVIS Model E., 2-speed, £47/10; actually here: Popular Model delivered in 7 days, £38; also 1915 Popular, £27/10; and 1916 £31/10.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [2082]

MOTOR CYCLES FOR SALE.

Levis.

LEVIS Popular, 2½ h.p., little used, splendid condition, guaranteed sound, and a good hill-climber, tyres and belt new, new Dixie mag.; genuine bargain; for inspection, trial; £23.—Webb, 5, School Rd., Hounslow, Middlesex. [2140]

LEVIS, Levis, Levis.—A limited number of Popular and 2-speed Model E. for guaranteed early delivery. If you are interested in 2-stroke motor cycles, call and see us. Sole wholesale agents for London district.—Cars and Motor Sundries, Ltd., 24, Woodstock St. (off Oxford St.), Bond St., London, W.1. [0979]

Lincoln-Elk.

1913 2½ h.p. Lincoln-Elk, Bosch mag., perfect throughout; bargain, £15.—Howlett, 20, Lonsdale St., Stoke, Staffs. [2070]

1914 3½ h.p. Lincoln-Elk and Sidecar, 2-speed countershaft, kick starter, in grand running order; bargain, £25.—Berry, 125, Canal Rd., Mile End, E. [1990]

L.M.C.

L.M.C. 4 h.p. Combination, 1913, 2-speed, kick starter, good tyres, mechanically perfect, X1 all saddle; bargain, £35.—Butterworths' Garage, 64, Mill Lane, Brixton Hill. [2134]

Matchless

1919 Matchless, Victory Model; £140.—Ross, 86, High Rd., Lee. [2041]

MATCHLESS, early deliveries.—Sole Agent, J. A. Stacey, 12, Ecclesall Rd., Sheffield. [X1544]

MATCHLESS.—Actually in stock, latest 8 h.p. combinations with spare wheel; £140.—Parker's, Bradshawgate, Bolton. [X1520]

CROW Bros., High St., Guildford, West Surrey agents for the 1919 Matchless. Order now to ensure early delivery. [1552]

MATCHLESS Combination, 8 h.p. J.A.P., 2-speed, 1913, excellent condition; £45.—Bowland, 239a, Lord St., Southampton. [X1811]

RIDER TROWARD and Co., 31, High St., Hampstead.—Matchless. Earliest delivery Victory model combination, £140. [2269]

MATCHLESS 1915 M.A.G. 8 h.p. Combination, 2-seater sidecar, full set lamps, the turnout as new, stored since 1916; £93/10.—17, Abbey Rd., Croydon. [2045]

MATCHLESS Combination, 1914 model, thoroughly overhauled and repainted, not been used for 18 months, exceptional condition; 90 gns.—Knight, Dentist, Vauxton. [2018]

MATCHLESS Victory Model Combination actually in stock, with spare wheel and tyre; £140; seen by appointment.—J. Tassell, 10, Bloomfield Rd., Plumstead, S.E.18. [1606]

MATCHLESS.—Special contracting agents for post-war Matchless models; earliest deliveries; exchanges and easy payments arranged.—Mandess, 100, Gt. Portland St., London, W.1. [9920]

1918 Matchless Combination, Victory Model, complete, spare wheel, Lucas lamps, Klaxon, run 50 miles only; absolutely like new; £130, cost £147.—40, Castelnou Rd., Barnes, London, S.W. [X1611]

1917 Matchless 8 h.p. Combination, Montgomery sidecar, interchangeable wheels, spare wheel, hood, wind screen, luggage grid; £115, or exchange to value.—McKee, 1, Kenil Rd., Tooting, London. [2130]

£20.—Matchless-Jap 5.6 h.p. combination, Bosch, B. and B., 2-speed hub, now taken down for overhauling, but soon re-assembled; seen any time.—Marlow, 10, Springfield Crescent, Catford, S.E.6. [2102]

MATCHLESS Combination, late model, 8 h.p. M.A.G. engine, 3 speeds, clutch, kick starter, all enclosed chain drive machine, and tyres in excellent condition; £85, or would consider good lightweight in part exchange.—Box L8,458, c/o The Motor Cycle. [2101]

MATCHLESS 1915 8 h.p. M.A.G. Combination, 3-speed, clutch, kick start, speedometer, horn, Lucas lamps, large pump, new light car tyres, beautifully sprung 2-seater sidecar, with two wind screens, enamel lining as new, mileage 4,000; £90, lowest; insured for £100; owner buying car.—R. R. Harrison, 193, Nelson Rd., Gillingham, Kent. [2022]

Minerva.

MINERVA Motor Cycle, mag., new tyres, and in running order; £10.—G. Thurlly, Sudbrook, Grant-ham. [X1807]

2½ h.p. Minerva Lightweight, m.o.v.s, magneto, B. and B., good going order; bargain £9.—1, Westdale Rd., Forest Hill. [2208]

Motosacoche.

MOTOSACOCHE Lightweight, good running order, Palmers; £14.—Clark's, 9, Monks Rd., Lincoln. [X1802]

New Hudson.

NEW Hudson, 4 h.p., 3-speed, clutch, kick start, decompressor, speedometer, lamps, etc., complete with light sporting coachbuilt sidecar; any trial; £50, or lightweight and cash.—C.S., 497, Old Ford Rd., Bow, E.3. [2019]

New Imperial.

NEW Imperial, 1915, T.T., countershaft 2-speed; £25.—8, St. Nicholas Rd., Brighton. [2000]

CROW Bros., Guildford.—New Imperial, all models, new and overhauled second-hands stocked. [9772]

MOTOR CYCLES FOR SALE.

New Imperial.

NEW Imperial.—All models for immediate delivery.—J. A. Stacey, Sole Agent, 12, Ecclesall Rd., Sheffield. [X1545]

1915-16 New Imperial-Jap, 2½ h.p., 2-speed, excellent condition; £24, or offers.—Bunwell, Keevil, Trowbridge. [1951]

NEW Imperials, sole London agents.—2½ h.p. 2-speed 1919 models in stock; trade supplied.—Eys, Easton Rd. [1509]

1915-16 2½ h.p. 2-speed New Imperial-Jap, not done 500 miles; 25 gns.; seen by appointment only.—Johnson, New Hall, Stocksbridge, Sheffield. [1949]

NEW Imperial Motor Cycles.—2-speed, standard, and lady's models in stock for immediate delivery; no permits required.—P. J. Evans, 91, John Bright St., Birmingham [0957]

NEW Imperial-Jap, 2½ h.p., 1917, 2-speed, with auxiliary petrol starter for use when running on paraffin; £30, including accessories.—362, Upper Richmond, Putney, S.W.15. [X1664]

1916 New Imperial, 2½ h.p., 2-speed model, E.I.C. mag., mileage under 150, perfect in every detail, and as new; any inspection, trial; a bargain, £34.—Webb, 5, School Rd., Hounslow, Middlesex. [2139]

New Ryder.

£27.—New Ryder, 1917, 2½ h.p., 2-stroke, lamps, klaxon, etc., new condition, small mileage.—Apply after 5 p.m., Tunner, 18, Hestercombe Av., Fulham. [1959]

Norton.

1915 Norton, 3½ h.p., T.T., splendid condition; bargain, £45.—141, Hatfield Rd., St. Albans. [X1791]

NORTON.—Early delivery assured by placing your order with Parker's, Bradshawgate, Bolton. [X1522]

NORTON, T.T., 3½ h.p., 3-speed hub, new Henderson sidecar; £55.—86, California, Quinton, Birmingham. [X1788]

1919 Norton, all models; immediate delivery.—Walter Batchelor, Clarence St., Kingstons. Tel.: 1809. [1466]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new Nortons. [2266]

1917 T.T. Norton, 3½ h.p., Philipson pulley, and hand control, electric lamps, all accessories; £60; fine fast touring mount.—J. Barton, Coln St. Aldwyn, Fairfield. [2006]

NORTON, 1916, special 4 h.p. T.T. machine, exceptionally fast, large Lucas head lamp, mechanical horn, Binks carburettor, very little used; £50.—Bolton Wroxall Abbey, near Warwick. [X1613]

NORTONS.—We are now booking orders for the latest model Nortons, solo and sidecar outfits; £5 deposit; deliveries in strictest rotation.—Maudsley, 100 Gt. Portland St., London, W.1. [1444]

N.S.U.

N.S.U., 3½ h.p., 2 speeds, magneto, B. and B., tyre, and machine excellent order, accessories; bargain, £16.—27, Bedford Rd., Clapham. [2209]

N.S.U. Motor Cycle, 3½ h.p., 2 speeds, free engine, spring forks, spring frame, believed 1914 model, tyres in good condition, lamps, horn, spare belt, machine had little use; £35.—Kirkham, 198, High St., Cheltenham. [X1540]

N.U.T.

RIDER TROWARD and Co., 31, High St., Hampstead.—Nut, 3½ h.p., twin, 3-speed, clutch, kick start. Orders being booked for earliest delivery. [2270]

O.K.

RIDER TROWARD and Co., 31, High St., Hampstead.—O.K. Orders being booked for earliest delivery. [2271]

O.K. Juniors must be booked now if you really want to get there and back every time.—Young's, The Parade, Kilburn, N.W.6. [0967]

P. and M.

REMOVAL of Petrol Restrictions on January 10th will again enable many firms to run light delivery vans. We have in garage several second-hand P. and M. motor cycles, 3½ h.p. 1914 and 1915 models, with torpedo delivery van mounted on sidecar chassis. Ready for immediate delivery. Running costs light, 60 miles to gallon.—For appointment to view and all particulars, write Eddlesden, 78, Stratford St., Leeds. [X1699]

Precision.

PRECISION, 3½ h.p., 1913, 2-speed, clutch, tyres excellent, B. and B. carburettor, mag.; £25.—77, Queen St., Morley, Leeds. [2065]

PRECISION, 1913, 3½ h.p., in excellent condition, B. and B., Bosch, N.S.U. 2-speed, recently overhauled; £25, with coachbuilt sidecar (underslung) £32.—Beal, 12, Musgrave St., W. Hartlepool. (D) [1993]

4½ h.p. Precision (late 1915), sidecar machine, good as new, plating and enamel in good condition, Dunlop belt, B. and B. overhead feed carburettor, aluminium foot plates, Fischer mag., 3-speed S.A. gear, lamps, etc.; only reason for selling, going abroad; £60, or near offer.—Box 2,640, c/o The Motor Cycle. [X1748]



WELL and truly made from forged steel, "King Dick" Spanners grip "fair and square." They cannot burr a nut when properly adjusted. Famous for 35 years; guaranteed for ever. Four sizes, 3in., 4in., 6in., and 9in.

See that your spanner is stamped with the Bulldog mark shown above—the mark of the genuine "King Dick."

ABINGDON ECCO LTD
Abingdon Works
TYSELEY BIRMINGHAM

London: G. H. Smith, 12, Mortimer Street, W.1.

MOTOR CYCLES FOR SALE.

Premier.

1911 Premier, 3½ h.p., Girdaud gear, Bosch, B.B. carburettor, splendid running order; £14.—16, York St., Dover. [1963]

PREMIER, 1914, 2½ h.p., in good condition, free engine, speedometer, Bosch mag.—23, Melbourne Rd., Ilford. [2143]

3½ h.p. Premier, 3-speed Armstrong gears, Bosch mag., grand solo, splendid condition; £22.—Thompson, Burleigh, Brockmoor, Brierley Hill. [X1787]

PREMIER, 1913, 3½ h.p., 3-speed (Armstrong), Bosch mag., B.B., kept in splendid condition, ready to ride away; £32.—60, High St., Berkhamsted, Herts. [X703]

1915 Premier, 2½ h.p., with automatic gear, all accessories, £21, new condition; or would exchange for good combination, cash adjustment.—S. Sandelton Rd., Erith. [2109]

PREMIER, 3½ h.p., wicker sidecar, 3-speed, heavy Dunlop tyres, kick starter, Lucas head lamps, £35; also Canoelet sidecar body, as new, and 4 volt accumulator.—H.F.G., 3, Byford Place, Mays Lane Rd., Barnet. [2157]

Rover.

3½ h.p. Rover Model, 3-speed countershaft, kick-start, clutch; £80.—Harrods, Ltd., Brompton Rd. [2230]

1911 3½ h.p. Rover, free engine, h.b.c., in excellent condition; £25, good bargain.—Apply, G. S. Lancaster, Newbiggin, Dacre, Penrith. [1968]

ROVER 1914 3½ h.p., 3-speed and clutch (Armstrong), all in perfect running order, except back wheel requires truing up; £39.—Moore, Doveston Bank, Doveston Rd., Sale. [2064]

ROVER, 3½ h.p., late model T.T., Philipson pulley, as new; £40; complete, 2 lamps, horn, speedometer, brand new rear tyre and belt.—Short, 485, Upper Richmond Rd., East Sheen. [2213]

ROVER, 1918, 3½ h.p., T.T. model, Philipson pulley, Dunlop tyres, long exhaust pipe, Lucas lamps, mechanical horn, etc., in excellent condition throughout, perfect order; £55; consider combination or lightweight part exchange.—Varty, Jarvis Hall, Thundersley, Essex. [2166]

Rudge.

RUDGE Multi Combination, splendid condition, late model, speedometer, lamps; £45.—71, Windermere Rd., South Ealing. [1960]

MOTOR CYCLES FOR SALE.

Rudge.

RUDGE, late 1914, 3½ h.p., clutch, condition as new, only wants seeing; £35.—Rose Law, Station Rd., New Barnet. 'Phone: 231. [X1793]

RIDER TROWARD and Co., 31, High St., Hampstead.—Rudge-Multi, I.O.M. models only: Orders being booked for earliest delivery. [2272]

1915 3½ h.p. Rudge Multi and coach sidecar, hand clutch, lamp set, C.A.V., Senspray, horn, luggage grid, spares, fast, reliable.—Gelder, Newton-on-Trent. [X1538]

RUDGE Multi, 1914, and sidecar, hand clutch, smart turnout; any trial run before purchase; price £38; exchanges.—Speechley, 1, Gunnersbury Lane, Acton Hill, London. [2127]

RUDGE, 1912, 3½ h.p., fixed gear, good condition, tyres almost new, also sidecar, wicker, wants doing up and tyre; seen any time; £18.—Sabb, Postmaster, Stradbroke, Suffolk. [2244]

RUDGE, 1913, 3½ h.p., fixed gear, kick starter, tyres are really good, practically new, bike is in good mechanical condition, and in running order, engine requires a little tuning, no lamps or accessories; not sent on approval; first £17 secures this bargain.—Leader, The Elms, Bishops Waltham. [2241]

Scott.

SCOTT, 7 h.p., 1914, 2-cyl., 2-speed, water-cooled, powerful hill-climber, good condition, tyres excellent; £30, worth £40.—L.N.S., 72, Salisbury Rd., Harrow, Middlesex. [2188]

Sheffield Minor.

1915 Sheffield Minor (Villiers), 2½ h.p., 2-stroke, mechanism perfect, appearance fine, tyres practically new; trial; price 27 gns. Write, or call after 7 p.m.—Townend, 130, Hamilton Rd., Golders Green, N.W.4. [2032]

Sunbeam.

1916 3½ h.p. Sunbeam, perfect condition; £65.—Ross, 86, High Rd., Lee. [2043]

1917 3½ h.p. Sunbeam Combination, lamps and horn, very good condition; £105.—Below.

WE have two 8 h.p. Sunbeam Combinations in stock, 1917 and 1918 models. Write for full particulars.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C.3. [0491]

SUNBEAM Late 1915 Combination, fully equipped, top condition; £78.—17, Abbey Rd., Croydon. [2045a]

SUNBEAM 1915 3½ h.p. Combination, 3-speed countershaft, kick start, perfect machine; £80.—129, High St., Croydon. [2146]

SUNBEAM, 1916, 3½ h.p., faultless condition; £67/10, or exchange.—Lt. Disney, R.A.F., Rossie, Kingston Hill, Surrey. [2192]

SUNBEAM, 3½ h.p., 3-speed, coachbuilt sidecar, gas head and tail lamps, speedometer, horn; £105.—Harrods, Ltd., Brompton Rd. [2232]

SUNBEAM, 6 h.p., 1914, Gloria sidecar De Luxe, speedometer, luggage trunk, not used 2 years; £75, no offers.—Armstrong, Sandycroft, Chester. [X1668]

SUNBEAM 1917 W.D. Model, Triplex tank, mileage under 1,000, absolutely as new and unscratched, fully equipped; £80.—46, Hillcrest Rd., Acton. 'Phone: 1578 Chiswick. [2117]

8 h.p. Sunbeam and Gloria sidecar, only done about 5,000 miles, good running order; owner leaving abroad, must sell; price £100.—Apply, W. S. Marchant, Prideaux House, Eastbourne. [1977]

SUNBEAM, 8 h.p. M.A.G. engine, sidecar, 3-speed, chain transmission, with patent oil bath, dynamo lighting set, hood, electric horn, glass screen, speedometer; £150.—Harrods, Ltd., Brompton Rd. [2231]

SUNBEAM.—Immediate delivery; actually in stock, new 3½ h.p. combination, pre-war finish, black and gold, luxurious turnout; early delivery of 8 h.p. combinations assured; exchanges.—Parker's, Bradshawgate, Bolton. [X1519]

SUNBEAM 1917 3½ h.p. Combination, with Phoenix coachbuilt sidecar, lamps, horn, warning signal, etc., not run 1,000 miles, fully insured to June, 1919; what offers?—Thompson, c/o Ballantyne, 8a, Three Kings' Yard, Davies St., W.1. [2023]

1914 Sunbeam, 3½ h.p., 3-speed countershaft, Lucas horn, 2 lamps, 2 generators, speedometer, spare tube and case, Bosch mag., B.S.A. carburettor, new breadought Clincher back, machine little used, splendid condition; £57/10, lowest.—Wagner Linde, Woodcote Park Rd., Epsom. [X1529]

Triumph.

LATEST Model Triumph in stock; £85.—Cross, Agent, Rotherham. [X1782]

TRIUMPH Motor Cycle, 1911 model, complete, good tyres; £14.—Springett, Billericay, Essex. [1996]

TRIUMPH, 1917, S.A. countershaft 3-speed; 65 gns.—Jenkins, 27, Gt. Dargate St., Aberystwyth. [X1667]

1914 Triumph and Sidecar, complete, lamps, etc., 3 speeds, clutch; £51.—Cross, Agent, Rotherham. [X1781]

TRIUMPH Combination, 1913-1919, or A.J.S.—Full particulars, 52, Alexandra Rd., Canton, Cardiff. [2072]

TRIUMPH, free engine, 1912, just thoroughly overhauled; £20.—Box L8,466, c/o The Motor Cycle. [X254]

MOTOR CYCLES FOR SALE.

Triumph.

TRIUMPH, 3 speeds, clutch, lamps, accessories; £36, bargain.—10, Brackley Rd., Chiswick. [2161]

1913 Clutch Triumph, perfect condition, all accessories; £25.—10, Champion Park, Denmark Hill S.E. [X1746]

1911 Triumph, fixed engine, lamp, horn, etc., running order; £18.—Gandy, Rodney, Brockenhurst, Hants. [X1612]

1919 Countershaft Triumphs: immediate delivery; £85.—Wallace Batchelor, Clarence St., Kingston. Tel.: 1809. [1462]

TRIUMPHS.—Early deliveries, new models; your old machine taken in part payment.—Parker and Son, St. Ives, Hants. [1971]

1911 Triumph, 3½ h.p., good condition, new belt, nearly new tyres, lamps, horn, etc.; £15.—16, York St., Dover. [1964]

TRIUMPH, complete with all tools, lamps, etc., guaranteed in good order; £25.—Douglas Morpuss, Sedgley, Dudley. [X1766]

1914 Triumph, 4 h.p., 3-speed, and sidecar, recently overhauled; £40.—Gibbs, 25, Evesham Place, Stratford-on-Avon. [X1769]

1913 Clutch Model Triumph, good condition, complete with accessories and spares; £30.—Harris, 29, Essex Rd., Acton. [2031]

TRIUMPH, 1912, 3½ h.p., clutch model, in good condition; £32.—Thomas, 83, Devonport Rd., Shepherd's Bush, W.12. [2150]

T.T. Triumph, 1912, rebuilt 1914, Mabon gears, Kempshalls, new tank, perfect condition; £27.—39, Longley Rd., Tooting. [X1771]

1914 4 h.p. Triumph, clutch and 3-speed, sound, reliable machine; £45, or best offer.—Ellum, 40, Herbert St., West Bromwich. [2003]

TRIUMPH.—Immediate delivery latest countershaft and 2-stroke models. Several second-hand from £20.—Parker's, Bradshawgate, Bolton. [X1517]

TRIUMPH Motor Cycle, 3½ h.p., 2-speed, free engine, fine order; £26, or exchange with cash for good lightweight.—6, Beam St., Nantwich. [X1524]

TRIUMPH, 2-stroke, 1915, very little ridden, as new, complete with Lucas lamps, horn, and tools; 39 gas., bargain.—H., 23, Crockerton Rd., Upper Tooting. [1969]

TRIUMPH, 1914, 3-speed, Gloria sidecar, £42; 1907 Triumph, £15; Stewart speedometer, less cable and attachments, 35/—Visick, 9, King's Parade, N.3. [2073]

3½ h.p. 1914 Triumph Combination, 3-speed S.A. hub gear end clutch, Mills-Fulford sidecar, 3 lamps and horn; £47/10.—Gray, Heatherlea, Dartford Heath. [X1792]

RIDER TROWARD and Co., 31, High St., Hampstead.—Triumph, delivery February, 4 h.p., £85. Orders being booked for 2-stroke, earliest delivery. [2273]

TRIUMPH, 4 h.p., countershaft 3-speed gear, used 200 miles, Lucas accessories; owner bought car; £75.—C.H.B., 66, Waverley Av., Peckham Rye, London. [2112]

TRIUMPH, 1913, 3-speed, hand-controlled clutch, semi-T.T. bars, excellent tyres, and well equipped; bargain, £36/10.—Longman Bros., 2, King's Parade, Acton Hill. 'Phone: 1578 Chiswick. [2119]

TRIUMPHS (two), latest 1919 models, actually on the premises, £85; also 3½ h.p. 3-speed hub combination, £43, in fine condition; exchanges.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [2080]

4 h.p. Triumph, 1913, and coachbuilt sidecar, 3-speed, Klaxon, lamps, apron, speedometer, new tyres and tubes, perfect order; any trial; £48.—Partridge, 26 Kennington Oval, London S.E. [1986]

SPLENDID Late 1916 4 h.p. Countershaft Triumph—Gloria combination, purchased October, 1916, used during summer of 1917 only, condition and appearance as new; bargain, £85.—13, Richardson Rd., Eccles, Manchester. [X1804]

TRIUMPH, 1914, 4 h.p., 3-speed, clutch, adjustable pulley, head lamp, generator, Klaxon horn, tools, good condition, tyres nearly new, £35; with coachbuilt sidecar, £40.—H. Stevens, 25, London Rd., Salisbury. [2167]

TRIUMPH 1914 4 h.p. Combination, Sturmer-Archer 3-speed, clutch, Bosch mag., Brooks saddle, Stewart speedometer, Lucas lamps, kit of tools, Canelet sidecar machine and sidecar very little used; £55; any trial arranged.—Edwards, The Bell Inn, Sotwell, Wellingford, Berks. [1995]

Velocette

2½ h.p. Velocette, 2-stroke, chain drive, hand operated 2-speed gear, automatic lubrication, new tyres, new lamp, in excellent condition; £28.—Lieut. Jones, Dungeness, Kent. [X1735]

Williamson.

WILLIAMSON 8-10 h.p. Combination, 3-seater sidecar, hood, wind screen, speedometer, electric lighting, tools, spares, family outfit, as new, low mileage; accept £65.—436, Whitehorse Rd., Thornton Heath S.E. [2251]

Jones' Garage

1, BROADWAY,

Muswell Hill, LONDON, N.10.

'Phone: Hornsey 2562.

1919 NEW MODELS

actually in Stock
for immediate delivery.

MATCHLESS Combinations,
Victory Models, spare
wheel, detachable, and
all interchangeable £140 0

IXION, 2 strokes, single-
speeds £33 0

Model K B.S.A., 4½ h.p.,
latest models £79 18

ROVERS, T.T. Models, fitted
with Philipson pulley,
latest models £67 10

ROVERS, 3-speed models,
latest models £80 0

ARIELS, 3-speed models .. £80 0

NEW IMPERIAL Combina-
tions, 8 b.p. £126 0

For our present stock of New
and Second-hand Machines, see
"Miscellaneous Motor Cycles."

MOTOR CYCLES FOR SALE.

Williamson.

8 h.p. Williamson, 1914, coach sidecar, very roomy, all-chain drive, 2-speed countershaft, clutch, lamps and horn, 650x65 tyres all round, in fair condition; £60, or exchange.—Vickers, Newsagent, Meadowfield, Durham. [X1778]

Zenith.

ZENITH, 1914, 8 h.p., T.T. bars, very fast machine; first cheque £30 secures.—Sanderson's Garage, Brongh, Westmorland. [X1609]

4 h.p. 1915 Countershaft Zenith and Mills-Fulford coachbuilt sidecar, perfect running order; £55.—Box 2,639, c/o The Motor Cycle. [X1749]

RIDER TROWARD and Co., 31, High St., Hampstead.—Zenith-Gradua, new models, delivery this month; prices on application. [2274]

ZENITH 1915 5 h.p. Twin, countershaft, clutch, sporting Phoenix sidecar, Binks, fast, good condition; £60, near offer.—3, Sherborne Rd., Yeovil. [1936]

ZENITH-GRADUA, 1915, 6 h.p., clutch, kick starter, T.T. handle-bars, coachbuilt sidecar, with screen and apron, as new; £76.—Rose Lawn, New Barnet. 'Phone: 231. [X1537]

ZENITH-GRADUA, 1911, 3½ h.p. J.A.P., Bosch, Amac, Druids, new Dunlop, P. and H. lamp, horn, idle 3 years; £20, near offer.—Box 2,624, c/o The Motor Cycle. [X1610]

3½ h.p. Zenith-Gradua Combination (wicker), 1912, 32 fully equipped, splendid condition, stored 3 years, overhauled; £26; separate or exchange.—55, Watling St., Wellington, Salop. [X1660]

ZENITH-GRADUA, 1913, 3½ h.p., single, drop frame, head and tail lamps, generator, horn, speedometer, good tyres just been overhauled; £30.—The Manager, Falcon Works, 82, Wallis Rd., Hackney Wick, E.9. [1967]

ZENITH 5 h.p. Combination, sporting coachbuilt sidecar, fully equipped, in splendid condition, good as new, bought 1916, not used during war; nearest £57, bargain.—Apply, 215, Putney Bridge Rd., Putney. [1952]

6 h.p. Zenith C.B. Combination, Oct., 1914, stored away 2½ years, perfect condition, new belt and tyres, brass car head lamp, horn, speedometer, etc.; £54.—G. Kitchingman, 76, Compton Row, Harehills, Leeds. [X1775]

Miscellaneous.

4 h.p. Single-cyl. Motor Cycle, magneto, low, etc., £10; also two push cycles, £3 each.—Smith, 199b, King St., Hammersmith. [2162]

MOTOR CYCLES FOR SALE.

Miscellaneous.

2½ h.p. and 2 h.p. for sale, £12 and £3.—197, New Rd., Battersea. [X1723]

THE H.C. Motor Co., 347, Finchley Rd., have the following machines for sale, all guaranteed to be in perfect running order, cash or exchanges:

SUN, 1915, 2-speed, 2-stroke, B. and B., Villiers engine; 26 gas. (13)

PREMIER, 1913, 3-speed, clutch, splendid condition; 29 gas. (18)

VELOCETTE, 1915, dropped frame, 2-stroke, 2-speed, U.H. mag., Senspray carburetter, all chain drive; 24 gas. (19)

PREMIER, 1914, 2½ h.p., clutch model, Bosch mag., in fine condition; 27 gas. (30)

CALTHORPE J.A.P., 1915, 2½ h.p., 2-speed, Enfield gear, just been re-namelled; 28 gas. (36)

B.S.A., 1916, 4½ h.p., 3-speed countershaft, in splendid condition; 59 gas. (62)

HUMBER, 1914, 2½ h.p. twin, 3-speed, in fine condition, just overhauled; 30 gas. (58)

PRECISION, 3½ h.p., Bosch, B. and B., single speed, guaranteed; 17 gas. (59)

SINGER, 1914, 3½ h.p., 2-speed countershaft, dropped frame, perfect condition; 35 gas. (61)

SUNBEAM Combination, 1915, 6 h.p., De Luxe sidecar, light car tyres, in perfect condition throughout, and as new; 105 gas. (63)

TRIUMPH, 1913, 3½ h.p., clutch model, in fine condition; Bosch; 29 gas. (53)

WOLF, 2½ h.p., 2-stroke, single speed, 1917, shop-soiled only; 27 gas. (66)

SUN-V.T.S., 2-speed, 2-stroke, 1918, run 10 miles only, as new; 37 gas. (68)

THE H.C. Motor Co., 347, Finchley Rd., N.W.3. 'Phone: Hampstead 4631. Open Saturday afternoons and Sundays. [1573]

JONES' Garage.—1914 Ariel 5-6 h.p. Combination, in very good order; £70.—1, The Broadway, Muswell Hill, N.10.

JONES' Garage.—1914 2-stroke 2-speed Clyno, in splendid order; £35.—1, The Broadway, Muswell Hill, N.10.

JONES' Garage.—Rudge Multi, indistinguishable from new, actual maker's guarantee given with machine; £72/10.—1, The Broadway, Muswell Hill, N.10.

JONES' Garage.—Rudge Multi, in splendid condition, as new, actual maker's guarantee given with machine; £70.—1, The Broadway, Muswell Hill, N.10.

JONES' Garage.—Rudge Multi, in splendid condition, only wants seeing, actual maker's guarantee given; £69.—1, The Broadway, Muswell Hill, N.10.

JONES' Garage.—1916 Abingdon King Dick, in splendid condition; £50.—1, The Broadway, Muswell Hill, N.10.

JONES' Garage.—1914 Kerry-Abingdon, 2-speed, in good order; £35.—1, The Broadway, Muswell Hill, N.10.

JONES' Garage.—1916 3 h.p. Enfield, T.T. model, 2-speed, as new; £57.—1, The Broadway, Muswell Hill, N.10.

JONES' Garage.—1915 New Imperial, 2-speed; £40.—1, The Broadway, Muswell Hill, N.10.

JONES' Garage.—1916 New Imperial, 2-speed; £45.—1, The Broadway, Muswell Hill, N.10.

JONES' Garage.—1914 Sunbeam, 2-speed, kick start, oil bath, etc.; £45.—1, The Broadway, Muswell Hill, N.10.

JONES' Garage.—Torpedo motor cycle, 2-speed, about 1914; £22.—1, The Broadway, Muswell Hill, N.10.

JONES' Garage.—1914 3½ h.p. Zenith, in fine order; £45.—1, The Broadway, Muswell Hill, N.10.

JONES' Garage.—1915 2½ h.p. 2-speed Douglas; £42/10.—1, The Broadway, Muswell Hill, N.10.

JONES' Garage.—1915 Calthorpe-Jap, 2-speed; £30.—1, The Broadway, Muswell Hill, N.10.

JONES' Garage.—Crescent 2-stroke, 2-speed, as new; £28.—1, The Broadway, Muswell Hill, N.10.

JONES' Garage.—We have also a large stock of other guaranteed machines in stock; send for lists.—1, The Broadway, Muswell Hill, N.10. [7827]

£27/10, first cash secures.—6 h.p. twin, 1914, 2-speed, coachbuilt combination, spring frame, water-proof Bosch, B. and B., absolutely perfect order; stored 2 years; N.S.U.—Railway Garage, Staines. 'Phone: 2,606, c/o The Motor Cycle. [X1465]

INDIAN, 7-9 h.p., 1913, spring frame, 2-speed combination, spring wheel sidecar; also 5-6 h.p. Blumfield twin engine, complete with C.A.V. magneto, silencers, etc., all in first-class order; what offers?—Box 2,606, c/o The Motor Cycle. [X1465]

MOTOR CYCLES FOR SALE.

Miscellaneous.

CASH Bargains.—New 4hp. 3-speed Douglas combination, £95; new 2½hp. War Office Douglas, £60; 2½hp. Douglas (Sept., 1913), 2 speeds, £34/10; 1916 6hp. Enfield combination, £85; 1912 6hp. Enfield and sidecar, £32/10; 3½hp. 2-speed N.S.U., £19/10; 1914 6hp. 2-speed Rex, wants attention, £32/10; 2½hp. 3-speed Rex, £22/10; 2-speed twin Rex, £18/10.—Halifax Motor Exchange (new address), 136, Union St. South, Halifax. [2056]

RIDER TROWARD and Co., 31, High St., Hampstead, have a good selection of second-hand motor cycles for sale at cheap prices, including: Bat-Jap, 3½hp., 16 gns.; Bat-Jap, 1912, 2-speed, 29 gns.; Douglas, 1911, single-speed, 17 gns.; Enfield, 2½hp., 2-speed, 25 gns.; Humber, 1913, 3½hp., 2-speed, 29 gns.; James, 1913, 4½hp., clutch, 27 gns.; Lincoln Elk, 1913, 3½hp., 19 gns.; Minerva, 3½hp., 16 gns.; N.S.U., 7-9hp., Grado gear, 19 gns.; N.S.U., 3hp., twin, 2-speed, 22 gns.; Premier, 1913, 3½hp., 25 gns.; and others. Full list of over 100 free. [2275]

WANDSWORTH Motor Exchange.—Great bargains, only a few left: 1917 Lewis, 36 gns.; 1916 O.K., 29 gns.; 1916 Hobart, 25 gns.; 1915 T.T. Douglas, 45 gns.; 1914 P. and M., 45 gns.; Ariel, 3¼hp., 35 gns.; 1915 Indian, 39 gns.; 1916 T.B.C., 25 gns.; F.N., 4 cys., nearly new, 55 gns.; Sun-Precision, T.T. type, 23 gns.; Bradbury, 3½hp., 16 gns.; Brown twin, 19 gns.; red Indian 7-9hp. combination, 55 gns.; Clyno combination, 42 gns.; Douglas, 15 gns.; F.N., 4 cys., 18 gns.; 1914½ Morgan 2-seater, 85 gns.; Phoenix 2-seater, 95 gns. Exchanges entertained, also easy terms. We are spot cash buyers of good motor cycles. Bring or send.—Wandsworth Motor Exchange, Ebner St., Wandsworth (Town Station). Phone: Battersea 327. [2122]

SIDECAR ATTACHMENTS.

SWAN Sidecar, as new, painted green and black; £10/10.—17, Abbey Rd., Croydon. [2047]

BASTONES for Sidecars at low prices.—228, Pentonville Rd., King's Cross, London, N.1. [2238]

SIX Cane Sidecar Bodies and Chassis in good condition; to clear £15 lot.—Sanders, Hitchin. [2016]

CANOLET B.S.A. chassis, stand luggage grid; 24; appointment.—53, Brownhill Rd., Catford. [2105]

BRAND New Sidecar, complete, ready to fix; £8.—Wadford Garage, 306a, Walworth Rd., S.E. [2247]

SPRUNG Sidecar Chassis, wheel, tyre, tube, mudguard, nice condition; £4/17/6, bargain.—Jarrett, 130, Bunhill Row, E.C. [2027]

CANOLET Cane Sidecar, upholstered in red leather, toolbox in rear, suit 3½ to 5hp.; £5/10.—19, Wilcox Rd., South Lambeth, London. [2217]

SIDECARS and Chassis, touring, tradesmen's, and sporting models; good variety; deliveries from stock.—Burbury Sidecar Works, Farm St., Birmingham. [1565]

RENNOC Sidecars are manufactured at the Rennoc Motor Sidecar and Engineering Works, 86, Victoria Rd., Stroud Green, London, N.4.

RENNOC Sidecars are designed and manufactured under the personal supervision of Mr. George Conner.

RENNOC Sidecars.—We supply lugs, rims, spokes, upholstery material, tubing, springs, and all fittings for any make sidecar.

RENNOC Sidecar Bodies, hoods, screens, wheel discs, etc., actual manufacturers, wholesale, retail, and export.

RENNOC Sidecars.—We specialise in frame repairs to motor cycle and sidecars.

RENNOC Sidecars.—Special department for sidecar body repairs, repainting, upholstery, lining, etc.

PHENIX Sidecars.—The Rennoc Co. can supply all spares and undertake repairs for this make.

RENNOC Sidecars.—14 models to fit all motors; tandems a speciality.

RENNOC Sidecars.—We can give immediate delivery of all models.

RENNOC Sidecars to suit Harley, Yale, Indian, Excelsior, Pope, and all American models.

RENNOC Sidecars specialise in motor cycle and sidecar frame repairs, enamelling and plating.

RENNOC Sidecars are actual manufacturers of hoods, screens, and wheel discs.

RENNOC Sidecars have always in stock second-hand and clearance sidecars; special list.

RENNOC Sidecars have in stock 17 different design bodies to suit old and new pattern chassis.

RENNOC Sidecars advise you to place your present sidecar with us to be overhauled, we have a special department.

RENNOC Sidecar Works, 86, Victoria Rd., Tollington Park, Stroud Green, London, N.4. [2215]

G.K. Sidecar Co.—Phone us, Holborn 933, for quotation for repairing or renovating your sidecar. Sidecars in stock. Hoods, screens, aprons, etc. Reasonable charges.—336, Gray's Inn Rd., W.C.1. [2207]

SIDECAR Chassis, with wheel and new tyre, 26x2¼, complete with fittings, £22/10; basket car, 6½; two new chains, 1in. x ½in., 5 feet long each. Brampton, £2.—Fred Heaton, Carr Rd., Wyke, Bradford. [X1665]



Sidecars of all Types.

We are in a position now to supply Sidecars of all Types for Commercial, Pleasure, and Sporting Purposes. All our Sidecars are pre-eminently the best obtainable, and the prices asked are extremely low when the high-grade work is taken into consideration. Satisfaction guaranteed.

Send for our Catalogue.

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The Willowbrook Co.,
WILLOWBROOK WORKS,
Belgrave Gate, Leicester.

SIDE-CARRIERS AND PARCEL-CARS.

CANOLET Tradesman Side Box, nice order; £9; appointment.—53, Brownhill Rd., Catford. [2106]

9hp. De Dion Car, van body, Splitdorf mag., B. and B. carburettor, 225, or exchange for motor cycle combination.—Hellensohn Co., 189, High St., Peckham. [X1546]

6-8hp. w.c. Rover Light Van, 3 speeds and reverse, Bosch, B. and B. carry 5cwt., suitable conversion cycle car; £40; combination exchange considered.—Jarrett, 130, Bunhill Row, E.C. [2028]

RUNABOUTS AND CYCLE CARS.

1914 7-9hp. Swift Cycle Car, very nice condition; £120.—Ross, 86, High Rd., Lea. [2044]

THE Gibbons Cycle Car Company's Announcement must interest you. See Miscellaneous column. [1980]

1914-15 Collingwood 8-10hp. Cycle Car, 2-seater; £85, exchange combination.—Wright, 113, Blair St., Poplar, London. [2225]

A.C. Sociable, in excellent condition, just overhauled, suit doctor or traveller; bargain, £40.—Brown, 31, Androse Av., Reading. [2071]

CYCLE Car, 3 wheels, 6hp. Riley, w.c. engine, 3 speeds, reverse, wind screen, electric lamps; £50, or exchange.—76, London St., Chertsey. [2078]

HUMBER Light Car, 6hp., U.H. mag., B.B. carburettor, 3 speeds, reverse, wants finishing; £10; seen Sundays.—96, Greyhound Rd. [2178]

MORGAN, 1914, J.A.P., a.c., hood, screen, lamps, speedometer, fast, smart, paint excellent; £88, offer, exchange.—24, Beaulieu Rd., East Dulwich. [1956]

MORGAN, air-cooled J.A.P., late 1913, mag., speedometer, all working parts renewed, hood, horn, spares, tools, lamps; any trial; £75.—Box L8, 427, o/o The Motor Cycle. [2009]

MORGAN, 1917, G.P., hood, screen, 10hp. w.c., new gears, speedometer; also 1915 w.c. Humber-ette; part exchange agreeable.—Railway Garage, Staines. Phone: 46. [2200]

GRAND Prix Morgan, 1915, water-cooled, disc wheels, all brass screen, hood, 5 lamps, generator, spare chain (new), and links, oversize tyres, painted red, in excellent condition; £105; seen any evening after 6 o'clock.—Lawrence, 10, Morley Rd., E. Twickenham, near Richmond Bridge. [2050]

MORGAN 1917 Grand Prix, M.A.G. engine, in perfect condition throughout, chain and buck tyre both brand new, total mileage under 3,000, full usual equipment, including disc wheels, speedometer, etc.; £140; without new chain and horn, £5 less.—Johnson, 31, Leinster Gardens, Daywater. [X1765]

RUNABOUTS AND CYCLE CARS.

CYCLE Car Dismantled.—6hp. 1911 Rex twin, engine, Bosch mag., Amac carburettor, all controls, horn, Clair sileencer, Armstrong Mark VII, 3-speed wheel, almost new, 12½, 1½in. leather belt, 4ft. Renolds chain, front axle, springs, dumbirons, wheels, 3 good tyres, 8in. adjustable pulley, petrol tank, Best and Lloyd lubricator, chassis, etc., running order when dismantled; seen any evening; £30 lot, or sell separately.—Hammond, Leichmere, Olden Lane, Purley. [2114]

CARS FOR SALE.

10hp. Adams 2-seater, single-cyl. horizontal engine, excellent order; £22; motor cycle required.—Ashburnham, Litchfield Rd., Sutton, Surrey. [2147]

1915 2-seater Whiting-Grant, 4-cyl., dynamo lighting, self-starter, lamps; £120, exchange combination or cycle.—Wright, 113, Blair St., Poplar, London. [2224]

SINGER, 10hp., hood, screen, detachable wheels and spare, speedometer, dynamo lighting set, 5 lamps, very smart; £195; offer, exchange.—24, Beaulieu Rd., East Dulwich. [1957]

SWIFT 1914 2-seater, in perfect condition and running order, complete with all accessories, hood and screen; £130.—Exeter Motor Cycle and Light Car Co., Ltd., Bath Rd., Exeter. [0958]

10hp. 2-seater Riley, 2-cyl., 3 speeds, reverse, wire wheels, 700x85 tyres, and coachwork as new, wind screen, Cape hood, very fast; £80; appointment Sundays.—200, Church Rd., Willesden, N.W. [X1814]

SEVERAL Light Cars in stock for sale for cash or on our extended payment system, or your motor cycle in exchange; send for list, stating requirements.—Service Co., 292, High Holborn, London, W.C.1. [18735]

CALCOTT 1915 2-seater, Calthorpe Minor, 1916 sports 3-seater, Singer, 1915 10hp. 2-seater, 90 h.p. Prince Henry Mercedes, 90hp. Grand Prix Italia 1914, 1914 Morris-Oxford; part exchange agreeable.—Railway Garage, Staines. Phone: 46. [2201]

RIDER TROWARD and Co., 31, High St., Hampstead, have always a good selection of second-hand sporting and light cars, including sporting 2-seater R.M.C. 90hp. Mercedes, 80hp. Berliet, 60hp. Gregoire, 4-seater 35hp. Mercedes, 45hp. Mercedes, 15.5hp. Briscoe, 11hp. Perry, 10hp. Alldays, etc. Exchanges. [2276]

DEMORILISATION Bargains! And such bargain! Remember some of the cars almost new, and all dates advertised here guaranteed accurate.—10hp. Unique parcels lorry, modern, light car type, pointed radiators, wire wheels, worth double, £45; 10hp. Darracq 2-seater, detachable wire wheels, spare, dickey seat, bargain, £65; 15hp. Charron chassis, 4-cyl. monobloc, Solex, worth double, £65; 12-16hp. Motobloc chassis, unit engine, construction light, 4-cyl. chassis, £75; 14-16hp. Darracq traveller's omnibus, smart roomy body, chassis specially reconstructed, 4-cyl. monobloc, Zenith, gate, worth double, £80; 15.5hp. 1914 R.C.H. torpedo, monobloc, enclosed valves, detachables, centre gate, nice little 4-seater, £90; 12-15 h.p. Star 2-seater, gate, Zenith, £90; 30hp. National (U.S.A.), sporting 4-seater, fast car, £100; 38hp. Daimler chassis, £100; 2-ton Berliet chassis, twin solids, all gears new, wants slight adjustments, worth treble, to clear £100; Thames bungalow plot at Sunbury, £100 freehold; 8-10hp. Renault platform lorry, 8ft. x 5½ft., nice economical, £115; 15hp. Bayard 1-ton van, twin solids, roomy body, £115; 15-20hp. Panhard live axle chassis, £120; 8-10hp. 1914 sports model Humber streamline 2-seater, disc wheels, 40 m.p.g., £120; 40hp. 6-cyl. Acmé (U.S.A.) sporting 4-seater, special competition car, real snip, £125; 12-15hp. F.I.A.T. taxi-landaulet, monobloc engine, economical running high car, £125; 12-14hp. Renault landaulet, £130; 10-12hp. Le Gui semi-sporting 2-seater, 4-cyl. engine, Zenith, £135; 18hp. 1915 Maxter, smart roomy body, extra long chassis, enclosed valves, well streamline 4-seater, monobloc, 4-cyl. engine, centre gate, Bosch mag., £135; 2-ton Milnes-Daimler heavy commercial, twin solids, live axle, Zenith, H.T. mag., £145; 10hp. A.C. light car, streamline 2-seater, 4-cyl. monobloc, enclosed valves, pointed radiator, wire wheels, domed mudguards, £185; 3-ton Straker-Squire lorry, cab front, H.T. mag., Zenith, all new tyres, aluminium radiator, twin solids, bargain, £235; 1914 Palladium 1-ton van, solids all round, monobloc engine, enclosed valves, £245; 16-20hp. 4-speed chassis, enclosed valves, detachable wheels, £245; 4-cyl. engine, £250; 40hp. Wolsley chassis, enclosed valves, detachable wire wheels, extra long wheelbase, price overhauled £250; 20hp. Crossley torpedo, monobloc unit construction, detachable wheels, Zenith, £265; 15.5hp. 1914 B.S.A. 2-seater, Knight engine, worm drive, detachable wheels, £285; 3-ton De Dion commercial chassis, latest round radiator type, worm drive, enclosed valves, twin solids, steel wheels, £350; another exactly similar, better condition, £385; ditto 3-ton De Dion lorry, complete, roomy body, high sides, £425; 2-ton Napier W.D. type lorry, worm drive, aluminium radiator, enclosed valves, steel wheels, twin solids, bargain, £475; 4-ton late 1915 Garuer lorry, cab front, enclosed valves, twin solids, very little used indeed, real bargain, £650; 24-30hp. 6-cyl. Wolsley limousine-landaulet, enclosed valves, extra long wheelbase, detachable wire wheels, £650.—Cox (below).

DOUGLAS S. COX, the absolutely straight motor man, 6a, Lansdowne Hill, West Norwood, S.E., has all the above actually in stock and on view. Please call. Hours 8 to 6.30, including Saturdays; no business Sundays. Established 1902. [2248]

LORRIES FOR SALE.

4, 3, and 2-ton Lorries, dozen absolute bargains, £100 to £650. See long advertisement under Miscellaneous Cars.—Cox, West Norwood. [2249]

BODIES.

CANE Sidecar Bodies. Several to clear at 50/- each, worth £5; also several juvenile bodies; write for design.—The Willowbrook Co., Leicester. [0901]

BASTONE'S for Sidecar Bodies.—Several light wicker and coachbuilt bodies; also tandem and torpedo bodies at clearance prices.—228, Pentonville Rd., King's Cross, London, N.1. [2239]

SIDECAR Body Designs for the trade only. Working, coloured, pencil, or line drawings of original designs, also working drawings full sized or to scale.—Cooper's Vehicle Journal, Ltd., established designers to the coach trade for over 80 years. Consult us when designing new ideas.—20, Tudor St., London, E.C.4. [0818]

ENGINES.

4 h.p. M.M.C. Engine; £2/15.—P. Willcocks, Datchet, Bucks. [2185]

14 h.p. Twin J.A.P. Engine, with Bosch waterproof mag., nearly new, good running condition; £225.—Call, 126, Kentish Town Rd. [2211]

DAYTON, 2h.p., 2-stroke, mag., exhaust, pipe, silencer, almost new; £7.—Butterworth's Garage, 64, Mill Lane, Brixton Hill. [2135]

BRAND New J.A.P. Engines, 5h.p. twin, £19/10; 4h.p. twin, £18/10; 3h.p. twin, £14; cylinders (new) for 8h.p. and 2½h.p.; pistons for 8h.p., 6h.p., 4h.p., and 2½h.p.; 4h.p. o.v., single cylinder, £14.—1a, Bloomfield Rd., Plumstead, S.E.18. [1607]

IGNITION APPLIANCES.

U.H. 50° Twin, brand new, suit J.A.P.; £6.—17, Abbey Rd., Croydon. [2046]

BOSCH 180° Magneto, oil Douglas; £3; perfect condition.—Booth, 129, Grosvenor St., Derby. [2075]

SPECIAL Lightweight Magnetos; £3/15.—Service Co., 292, High Holborn, London, W.C.1. [3658]

BOSCH DT4 Cylinder Magneto, good order; £11; appointment.—53, Brownhill Rd., Catford. [2107]

HARLEY Magneto Dynamo Outfit, 3 lamps, needs attention £9/10; appointment.—53, Brownhill Rd., Catford. [2108]

BOSCH DA2, open type, anti, good condition, 60/-; also nearly new 180° Dixie, clockwise, with variable spark, 65/-.—26, Annesley Av., Hendon, N.W.9. [X1737]

NEW E.I.C., never been used, guaranteed 12 months, anti-clock, 180°; cost £8/10 from makers; accept £7/10; clockwise wanted.—Riddle, 21, Ayresome Rd., Middlesbrough. [X1567]

CHARLES PARKER and Co., Magneto Specialists, undertake to repair and despatch any and every magneto received by them in 24 hours, and guarantee their job for 12 months.—Below.

CHARLES PARKER and Co. have a special department for motor cycle magneto repairs, and assure you of instant attention.—Below.

CHARLES PARKER and Co. are making a special feature of speed in completing their transactions.—Below.

CHARLES PARKER and Co. always have a reserve force of mechanics awaiting that urgent job.—Below.

CHARLES PARKER and Co., Magneto Specialists, 75, Park Rd. North, Acton, London, W.3. Tel.: Chiswick 1518. [2099]

JEBRON, registered 291,298, greatly superior to platinum, unequalled for blades, screws, etc.; cures misfiring; 5/- each rivet; Jebron screws, fit Bosch magnetos, 11/- pair; old screws Jebronised, 5/- each. [X4531]

JEBRON Contacts, used by Messrs. Collier Bros., Colver, Martin, making world's records.—Jebron, 38, Herbert Rd., Woolwich, London, S.E.18. [X4531]

FOR Magneto Repairs, spares, re-magnetising, British magnetos and dynamo lighting equipments, write or phone Streatham 2108. Established 1900.—Love-land Bros., Crescent Magneto Works, Norbury, London, S.W. [8078]

MAGNETO Repairs.—Send your magneto to Palmer's Garage, Tooting. Reply paid; quotation telegraphed on receipt. Quick, efficient repair guaranteed in from 2 to 6 days, usually within 24 hours.—Palmer's Garage, Tooting. [3980]

BIRMINGHAM.—Magneto repairs, rewinding, re-magnetising, and overhauling promptly executed; moderate charges.—The Electrical Trades Supply Ltd., 41, Gt. Charles St., Birmingham. T.A.: Motors, Birmingham. Tel.: No. 1601 Central. [1721]

THE Magneto Repairing and Winding Co., Established 1912. Manager S. T. Boon, late from the Bosch works.—Magneto repairs of every description. All repairs at lowest possible prices, and strictly guaranteed. We can mostly return them within 24 hours. We have several new and second-hand single and 2-cyl. magnetos in stock, all guaranteed.—The Magneto Repairing and Winding Co., 158, Seymour St., Euston, N.W.1. Phone: Museum 1158. T.A.: Kumsgracht, Norwest, London. [1032]

Enamelling OUTFIT No. 1.

For Motor Cycle and Sidecar.



INCLUDES an ample supply of absolutely everything you need to thoroughly renovate a Motor Cycle and Sidecar. Contents: Sponge, Chamois Leather, Rubbing Felt, Pumice Block, Robbialac Brush, Glass Paper, Cleaning Soda, Pumice Powder, Auto-Stopper, "Rusholine" Polishing Liquid, Robbialac Thinners, Robbialac Stopping, Mat, Gloss, Transparent; and Instructions. Price 35/-. Carriage extra England and Wales 1/6. Scotland and Ireland 2/-. Full particulars, including large Colour Card, from Jensen & Nicholson, Ltd., M.C. Outfit Dept., Robbialac Works, Stratford, London, E.15. Sole manufacturers of



TYRES.

BASTONE'S for Covers and Tubes.—Special clearance lines as below:

BASTONE'S.—26x2 1/2 Michelin 10/6, steel stud 20/-.

BASTONE'S.—26x2 1/2 Michelin Trident 22/-, Hutchinson Brooklands 18/-, Tourist Trophy 25/-, passenger 30/-, Kempshall 19/6, de luxe heavy 30/-.

BASTONE'S.—26x2 1/2 Hutchinson T.T. 27/-, passenger 32/-.

BASTONE'S.—26x2 1/2 de luxe heavy 32/-, Gaulois rubber non-skid 18/6, Shell heavy grooved 18/6.

BASTONE'S.—650x65 Henley heavy plain 32/6.

BASTONE'S.—Hutchinson tubes, 26x2 5/6, 26x2 1/2 6/-, 26x2 1/2 6/6, 26x3 7/6.

BASTONE'S, 228, Pentonville Rd., King's Cross, London, N.1. Tel.: 2481 North. [2237]

ECONOMIC Tyre Co.—Another delivery of new Kempshall clearance covers; goods carriage paid; on approval against remittance.

ECONOMIC.—26x2 1/2 Kempshall anti-skid 19/6, listed 48/8; Kempshall non-skid 35/-, listed 61/4.

ECONOMIC.—26x2 1/2 Kempshall non-skid 45/-, listed 72/6; 26x3 non-skid 75/-, listed 96/-; very heavy oversize for 650x65.

ECONOMIC.—26x3 Kempshall heavy anti-skid 45/-, listed 72/6; oversize for 650x65.

ECONOMIC.—28x3 Kempshall anti-skid 40/-, listed 79/8; fit American rims, only few left.

ECONOMIC.—The following are made by one of the best-known British manufacturers:

ECONOMIC.—24x2 1/4 heavy non-skid, for 2-strokes, 32/6, listed 45/6; complete with tube, 39/6.

ECONOMIC.—26x2 1/2 extra heavy non-skid, for 2 1/4 rims, 41/-, listed 60/3.

ECONOMIC.—650x65 extra heavy non-skid 43/-, listed 65/-; 28x3 extra heavy 45/-, listed 69/8.

ECONOMIC.—26x2 1/4 tubes 7/6, 26x2 1/2 7/6, 26x 2 1/2 x 2 1/4 8/6, 26x2 1/2 8/6, 26x3 10/-.

ECONOMIC.—26x2 1/4 fluted covers, wired on, 7/6, pair 12/6; good make, only a few left.

ECONOMIC Tyre Co., 137a, Lewisham High Rd., New Cross, S.E.14. Phone: New Cross 1393. [1826]

SECOND-HAND 26x2 1/4 Tyre, sound, 7/-; 26x2 1/2 7/-; tubes, 4/-.—Smith, 199h, King St., Ham-mersmith. [2163]

TYRES.—See Bancroftian Advertisement under Miscellaneous. Stelastic, Pedley, Kempshall, Hutchinson; extraordinary prices. [0845]

TYRES.

TYRES by Best Makers; nearly half present prices.—26x2 1/2 sidecar cover, 16/6; Kempshall heavy anti-skid, 26x2 1/2, 18/6 each.—Service Co., 292, High Holborn, London, W.C.1. [8747]

NEW Beldam Tyres, 26x2 15/-, 26x2 1/4 17/6, 26x 2 1/2 £1, 26x3 25/-; tubes, 26x2 1/4 7/-, 26x2 1/2 9/6; all new and sound.—Shelley, 76, Victoria Rd., Harlesden, N.W.10. [2144]

BURST Motor Cycle Covers Remoulded and made perfect; broken away heads remoulded; every job a success, or cash refunded; bursts from 3/6, returned carriage paid quickly.—Melton Rubber Works, Melton Mowbray. [X1400]

NEW Heavy Beaded Covers, 26x2 16/-, 26x2 1/4 25/-, 26x2 1/2 27/6; hutt-ended tubes, 26x2 1/4 8/6, 26x 2 1/2 9/-; endless tubes, 26x2 1/4 7/6, 26x2 1/2 8/-; sent approval carriage paid receipt remittance.—Palmer's Garage, Tooting. [9191]

TWO 26x2 1/2, to fit 2 1/4, Goodyear covers, not done 20 miles, 35/- each; two 700x80, to fit 650x65, Clincher Dreadnought covers, 45/- each; brand new one 28x2 1/2 Continental cover, 30/-; 6ft. 3/4in. Dunlop belt, 5/6.—See Heppelthwaite, Miscellaneous Column. [2216]

BELTS.

4 New Pedley Belts, 1in. and 3/4in.; 12/- each.—Buckmaster, 160, Boundary Rd., Walthamstow. [2154]

TANKS.

TANKS of every description; repairs, re-enamelling. Write for booklet.—Green, Water St., Blackfriars, Manchester. [0900]

TANKS.—Tanks any shape to order, repairs or enamelled; disc for motor wheels; general sheet metal work; lists free.—Attwoods, 86, Rosebery Av., E.C. Tel.: Central 12445. [9922]

PATENTS.

THE Inventor of the U. and I. Double sidecar (side-by-side) wishes to sell his patent, and would be pleased to hear from any person interested in same. There should be a very good market for such an article to-day. It can be attached to almost any make of motor cycle, and at the same time giving practically all the comforts of a car. Very suitable for people who have lost a limb.—S. Lloyd, Uffculme, New Barnes Av., St. Albans, Herts. [2067]

PATENT AGENTS.

INVENTORS' Advice and Handhook Free.—King's Patent Agency, Ltd., 186, Queen Victoria St., London. [5818]

CONSULTING ENGINEERS.

THOMAS PEERS, late Mechanical Transport, Advisory Expert, new or second-hand machines; consultations, examinations.—18, Lothair Rd., Finsbury Park, London, N.4. [2004]

REX MUNDY, after twelve years' all-round experience, offers unbiased advice on the selection of new and second-hand motor cycles and light cars; examinations and reports; vehicles bought and sold on commission; insurance; interview by appointment.—Temporary address: Box L8,425, c/o The Motor Cycle. [1976]

DON'T Purchase that new or second-hand motor cycle or cycle car until you have consulted me. There are many Lenins on the market just now. I can probably save you pounds. My experience of practically every make is at your disposal. Enquiries re date, value, repairs, etc., answered by return on receipt of P.O. 2/6 and stamped addressed envelope. Money returned if not satisfied.—Engineer, Violet Villa, Withers, Cambs. [1979]

INSURANCE.

FOR Insurance of all kinds (especially motor), apply, Ernest J. Bass, Insurance Broker, Bishops Stortford. [0693]

DREADNOUGHT Motor Cycle Policies at Lloyd's. Premiums from £1/7/6, payable yearly, quarterly, or monthly. Before insuring elsewhere, write for prospectus.—Rays, Ltd., 199, Piccadilly, London. [7734]

TUITION.

MOTOR Tuition.—The British School of Motoring, Ltd., gives the highest standard of training in driving, mechanism, and repairs for the lowest fees in England. Call, or write for full particulars.—The British School of Motoring, 6, Coveyry St., Piccadilly Circus, W. [0953]

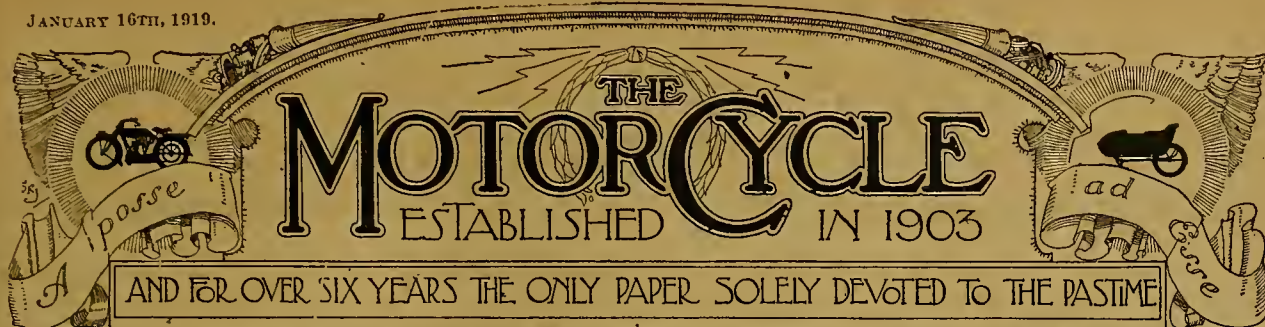
AGENCIES.

GENTLEMAN with first-class connection, residing in Brussels (Belgian subject who speaks English), desires to represent in Belgium English manufacturers of cycles, motor cycles, accessories and tyres; 20 years' experience of the trade.—A. Watelet, temporary address 12, Dudley St., Luton. [2068]

SITUATIONS VACANT.

WANTED, good all-round mechanics, for car, motor cycle, and cycle work; healthy position (moorland); suit discharged service men. State age, wages, experience, and references.—The Yelverton Garage, Yelverton, South Devon. [1652]

DRAFTSMAN Wanted, used to motor cycle design, including engines, gear boxes, and general lay-out.—Write in confidence, stating age, experience, and salary required, Mr. A. V. Smith, c/o Chatter-Lee, Ltd., 74-84, Banner St., E.C.1. [X1750]



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AUSTRALIA—Gordon & Gotch, Ltd., Melbourne (Victoria), Sydney (N.S.W.), Brisbane (Queensland), Adelaide (S.A.), Perth (W.A.), and Llanecston (Tasmania).
NEW ZEALAND—Gordon & Gotch, Ltd., Wellington, Auckland, Christchurch, and Dunedin. INDIA—A. H. Wheeler & Co., Bombay, Allahabad, and Calcutta.
SOUTH AFRICA—Central News Agency, Ltd. PARIS—Smith's English Library, 248 Rue Rivoli.

Government Motor Cycles.

IN our last issue we published an authoritative article on the disposal of surplus Government machines from a correspondent who is very closely in touch with all developments in this quarter. The conclusions to which our correspondent came were that bargain hunters would be in the main doomed to disappointment, and that the Government's best course would be to get the machines properly repaired by their makers at a reasonable cost and sold through the makers and their agents at a fair market price, and thus realise the full value for the property of the country. With this conclusion—we heartily agree.

The wastage of war is great enough in any case, and it is the obvious duty of all concerned to save the taxpayers' money wherever it is possible. There is, however, one class to whom special consideration is due, as we point out on another page. We refer to the men who in the early days of the war sold their machines to the Government at a valuation and enlisted in their country's service. It must be borne in mind that, although the price received was a fair one judged by 1914 standards, the same money would not purchase a similar machine in the open market to-day, for the scarcity and high prices of new machines at the present moment naturally react upon the second-hand market and cause a rise in value all round. Thus it is quite possible that a machine which had been stored during the war, provided that it had not suffered unduly from neglect or exposure, would fetch a better price now, in spite of its age—and motor cycles quickly become veterans—than if it had been sold in the year of its birth. This is partly because many machines have remained practically unchanged during the last five years, and partly due to the high prices and scarcity to which we have already alluded. It would then be a mere act of grace to give these men an opportunity of purchasing motor cycles equal to those which they owned

before the war at prices approximate to those for which they sold their former machines. Several correspondents have written to us upon this subject, and in one letter it is mentioned that a man may purchase from the army a horse to which he has become attached. The cases are not precisely similar, but if arrangements can be made in one instance it is also possible that they may be made in another.

The whole question of the disposal of war-worn motor cycles is an important one, and we are therefore dwelling upon it at some length. Further, we intend to keep the matter in view, and publish weekly the latest obtainable information.

Current Prices.

PRICES of motor cycles generally are 25% in advance of those of 1914, and there is a tendency among motor cyclists to consider them too high. Without any desire to make a plea of justification, we are, nevertheless, constrained to consider the present position in no way inconsistent with the times. As much as we wish to see motor cycles offered at pre-war prices, we are afraid it is more than can be expected, at least, until manufacturers have been able to adjust matters to the new conditions.

We can only guess the actual cost of labour and material represented in a motor cycle, but the price of all articles manufactured in trade is made up of material, labour, overhead expense, and makers' and retailers' profits. We know material and labour are up at least 100%, the third item, probably, not quite so much, although there is a great deal of labour in overhead expenses. We also know that profits are based on outgoings. So everything considered it does not appear that a 25% increase over pre-war prices is at all exorbitant, especially when it is remembered that in purchasing everything to-day the British public is called upon to pay advances in price considerably more than 25%.

IDEAS: Useful and Ingenious.

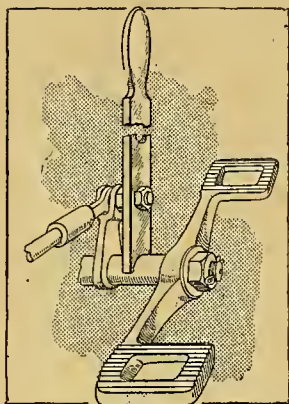
Sydney R. Jones

PRESERVATION OF INSULATING TAPE.

A RATHER good tip to prevent the annoying unravelling of the outer strands of insulating tape is to take a very sharp knife and make a number of light cuts across the diameter of the reel. It will be found that this effectually prevents the trouble.—R.H.B.

HAND CONTROL FOR TRIUMPH CLUTCH.

A HAND-CONTROL attachment can easily be fitted to the Triumph clutch-control pedal arrangement as follows: Procure an 18in. length of $\frac{3}{4}$ in. x $\frac{1}{4}$ in. flat iron and file the bottom end



An arrangement for controlling the clutch by hand.

to the radius of the pedal spindle. Drill a hole through the lever exactly opposite the bolt on the spindle arm and fit another bolt through the latter long enough to take the lever and the extra lever-retaining nut.—T. FAIR.

A NEW USE FOR A SPLIT PIN.

OCCASIONALLY a rod, rivet, or key must be inserted into a somewhat inaccessible hole, and it is often difficult to find a pair of pliers sufficiently small for the purpose. The illustration



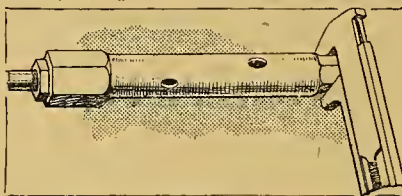
A new use for a split pin.

shows how a large split pin and a washer may be used in place of the pliers. This device might be quite suitable for the purpose of replacing the small circular key used to secure the spring on Douglas valve stems.—*Automobile aux Armées.*

A14

USE OF BOX SPANNER.

I N some awkward positions where it is necessary to use a box spanner it is often found that insufficient leverage can be obtained with the ordinary small tommy-bar provided, or the spanner may



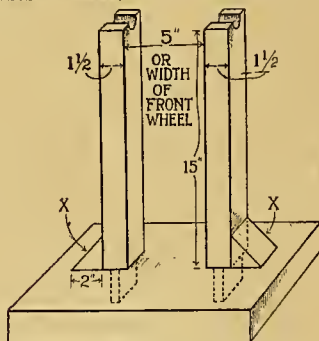
Adjustable spanner used in conjunction with a box spanner.

be too short or the bar too long or too weak. In many such cases it may be possible to turn the box spanner by means of an adjustable applied to the outside end as shown in the sketch.—L.A.B.

A CHEAP FRONT WHEEL STAND.

P R O C U R E three pieces of any hard wood, such as oak: (a) 34in. long by $1\frac{1}{2}$ in. square (for two uprights); (b) 2in. square by $1\frac{1}{2}$ in. thick (for supports marked X and X); (c) 18in. long by 8in. wide by 2in. thick (for base).

Take piece (a), find middle and bore $1\frac{1}{2}$ in. hole with brace, then cut into two for uprights. Tenon the ends to fit into mortises in base.



A simple front wheel stand.

Take piece (b), mark with line across the middle diagonally, and cut into two for supports to uprights at base.

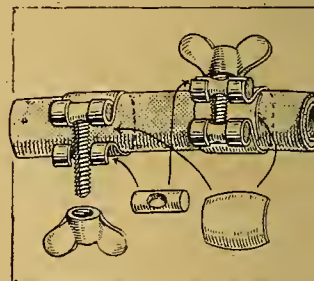
Take piece (c)—base—make two mortises about 5in. apart or any width to receive front wheel.

Glue the parts together, and the result is a strong stand to hold the front wheel off the floor either for storing or whilst repairing punctures in front tube.

If used only for storing, it will help to preserve the front cover, which soon deteriorates standing on the floor.—W.P.J.

PETROL PIPE BREAKAGES.

A VERY useful little device has been sent to us by a reader which would, in case of breakage of the petrol pipe, save endless trouble. It is composed of a piece of flexible tubing having clamps at each end that can be tightened to any degree by means of butterfly nuts. The tubing is inserted on the broken petrol pipe and the clamps screwed firmly

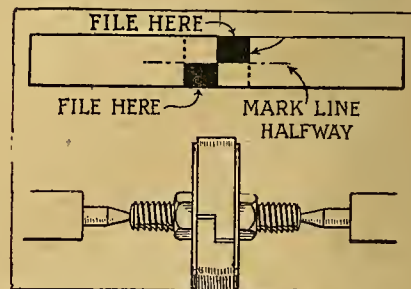


A handy repairing device

down, making a petrol-tight repair. The illustration clearly shows the arrangement. This device is used on aeroplanes, and can be obtained of the large accessory dealers.

CUTTING STEPPED RINGS.

T H O S E who cut their own piston rings are usually content with the diagonal slit, not knowing how easy it is to make the better job of a stepped joint. The sketch shows how this is done. After carefully scribing the centre line, the vertical rough cuts are made, and the square portions filed out. The ring is then closed up and held between end



Showing a method of cutting a stepped ring.

plates, which are fixed on a mandrel consisting of a bolt or stud with two nuts on it as shown. The ring can then be lapped to finished size in the lathe.—V.T.L.

OCCASIONAL
COMMENTSBY
"IXION"

No Fear!

IN a recent issue I meekly warned novices not to make a South Sea bubble of the flat twin, hinting that it is not an easy engine to design, and that some catchpenny merchants may unload dud samples on an eager public. This well-meant warning has brought down upon me the rage of Mr. Leonard B. Henderson, who is familiar with all the flat twins now undergoing development, and is satisfied that they are all super-excellent. I have not the pleasure of Mr. Henderson's acquaintance, but pass on his encyclopædic panegyric to my readers.

Back to the 'Bus.

THE other week I described various niggling little aggravations which I had to bear with when Christmas leave sent me back to the pre-war 'bus. All of them were concerned with replenishment and other routine attentions. Let me now cite the machine's conduct as a goer. It had done about 12,000 miles in its distant youth, and had not been overhauled, even by my own clumsy hands, for eighteen months, or run for a year. Nevertheless, it started up at the first pluck of the back wheel, and proceeded to reel off 700 miles without an involuntary stoppage; and, when I somewhat timidly opened it out down three miles of straight, deserted moorland road, it pushed its speedometer needle well up to 56 m.p.h. and held it there.

The "Hogbus."

IT may be perfectly true that an up-to-date engine of 350 c.c. or so with a suitable gear box will do its mile a minute and climb any hill, but until human nature is regenerated some of us will ask for more than this. An ex-R.A.F. pilot, accustomed to 150 m.p.h., will not be thrilled by slamming open his throttle with about 3½ h.p. loaded up to about 4 cwt. There will always be a small but select market for a sheer "hogbus," capable of climbing at terrific speed and of furious acceleration on the flat. We have yet to see an ideal mount of this character. In theory it should add its special hallmarks to the usual desiderata of light weight, comfort, and reliability. In practice such speedrons are generally very uncomfortable and absurdly heavy. They are not unreliable in the ordinary sense of the word; but like most high-bred animals they are flighty and capricious. The 60 or 70 m.p.h. which may represent their best gait, is not always on tap. I am not sure that owners want it to be. In this class at any rate the rider rather enjoys chasing round in search of a lost 100 r.p.m. or so. Beyond question the single-cylinder types of "hogbus" have been worked up to a higher pitch than their twin-cylinder rivals. The T.T. Triumph, Rudge, and Norton may challenge comparison with any invaders in this class. But where is the standard-

ised 7 h.p. British twin hogiron? I know some very fascinating o.h.v. big Japs have been put out by various makers, but I think the market would stand a little pushing in such machines if they were developed on the lines indicated. Several American machines, especially the short wheelbase Henderson, were attracting many of our riders in 1914. I admit there are distinct objections to the unrestricted sale of very fast machines, but if they are going to be sold let them be British.

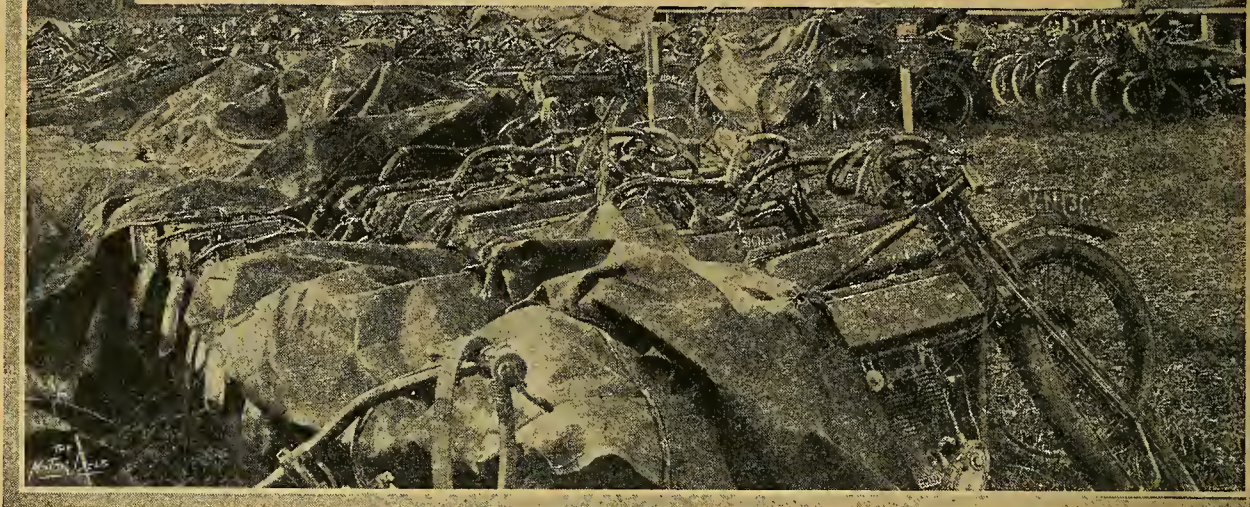
A Distortion Test.

NOW that joy-riding is again permissible, a clique of a few thoughtful friends may find some experiments with cylinder temperature interesting. The requisite apparatus consists of a mixed bunch of motor bicycles and a thermometer reading up to, say, 300°. (Two thermometers per machine are really desirable.) The aforesaid clique then proceeds to work the assorted engines rather hard, preferably by "scrapping" them along the road, though a full revs. climb on low gears or even a two minute run on the stand will suffice. Finally, the cylinder temperature is taken at various points, e.g.; on back and front walls level with the top of the piston stroke, on the valve chest and pulley or sprocket sides, over the exhaust and inlet valves, and at any other old pair of places which may occur to the experimenters. Ignore the absolute values, but pay special attention to the differences. Then consider mentally the advantages of an engine which shows the minimum contrast in temperature, e.g., between the back and front walls of the cylinder after a hard run on the road.

The Record Flat Twin.

ABOUT halfway through the war I became involved in a controversy with an engineer, who asserted that it was not possible to manufacture a satisfactory flat twin engine in the larger sizes, and implied that the 350 c.c. type approached the practical limits. This theory had no foundation in fact, but gentle Dora compelled me to argue in the abstract. I am now free to disclose that I waged that tantalising combat in close touch with a flat twin engine weighing 82 lb. and developing 52 b.h.p. This engine, I believe, was designed by Mr. Bradshaw in reply to an urgent demand from the War Office for a power unit to develop 40 h.p. and weigh not more than 100 lb. Plainly he more than fulfilled his share of the bargain, though the other apparatus essential to the projected stunt proved disappointing, and the "Gnat" was consequently stillborn so far as the war was concerned. Mr. Hawker actually attained 97 m.p.h. in horizontal flight with this two-cylinder engine (110 mm. x 120 mm.) fitted to a lilliputian scout. Perhaps we shall yet see a detuned "Gnat" on a cycle car chassis or in a world's record Brooklands bicycle!

THE WASTAGE OF WAR.



Unfit Army motor cycles, the majority of which will require a great amount of work expended on them before they are fit for the road. The machines were left in the state shown, the tarpaulins inadequate to protect them from wind and weather.

HUNDREDS of war-worn and discarded motor cycles, fit and unfit, are lying on Kempton Park Racecourse more or less exposed to the weather, illustrating the terrible wastage of material, labour, and money which war inevitably forces upon a people.

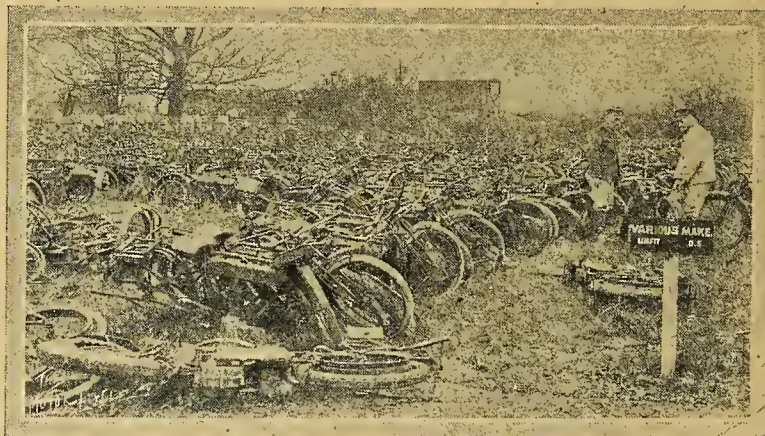
We have already written on the subject of war-worn motor cycles. An article, which appeared on June 14th, 1917, illustrated by photographs, showed hundreds of these machines; both their numbers and appalling condition called forth severe comments from many of our readers. Since the date of our article the Catford depot, which we mentioned, has been evacuated, and the Kempton Park depot, where there are still numerous machines, is in process of evacuation.

Now that the war is over, we frequently receive letters from readers asking for details as to the disposal of these remnants of the Great Conflict, and it is the object of this article to inform motor cyclists as to the actual position of affairs.

During the war Kempton Park Racecourse has been the distributing centre for army vehicles, as to this depot all new lorries, cars, and motor cycles were

sent direct from the manufacturers, thence to the mobilisation centre at Bulford, and from there direct to the various units Overseas. Kempton Park also received all the unfit vehicles, and lorries packed with damaged motor cycles are still arriving. As they arrive the machines are classified according to make and condition. Two-thirds of the number are usually fit for repair, and of these many—mostly of non-standard

makes—are placed in the motor cycle sales park. Non-standard makes are those which are neither Douglasses, Triumphs, P. and M.'s, nor Clynos, but such types as Sunbeams, A.J.S.'s, Ridges, Rovers, and other motor cycles made by well-known manufacturers which have been on home service. It is generally known that the army employs as few makes as possible so as to simplify the problem



Scrap and badly damaged machines, some of which are quite beyond repair

of spare parts. The classification of the machines referred to is only effected after they have been inspected by a board of officer experts.

New motor cycles in crates, ready for distribution, are placed under cover in open-sided sheds, and are not too well protected from the weather, as it can be seen that the outside machines are exposed to driving

The Wastage of War.—

rain or snow, and, even though grease is liberally applied to the bright parts, some evidences of rust are apparent. Machines which have been repaired in the army workshops are placed in crates and covered

magnetos at ridiculously low prices, but, despite careful enquiries, we have been quite unable to obtain any confirmation of this; in fact, we have been definitely informed that up to the present time none have been sold.



A panoramic view of the army machines under tarpaulin.

with tarpaulins. Motor cycles awaiting repair are in an open field, and as many as possible are placed under tarpaulins, but a vast number of unfits are without any protection whatever. It is the sight of this huge number of motor bicycles left day and night, winter and summer, exposed to all the vagaries of an English climate, that has led to so much criticism, and in defence of this it is argued, and not without reason, that most of them have been rescued from the battlefields of Flanders and elsewhere, where they have been exposed to rains other than

The sales park consists mostly of makes other than army standard. On the outside thereof there are crates of machines which have been rebuilt or repaired by the army, and when the war was on these would have been used for home service. In the centre of the park are the unfit machines, mostly denuded of saddles and magnetos, classified according to makes. The first notice reads: "4 Rover, unfit H.S., no more to be placed here," and the other notices are of a similar nature.

The disposal of army motor cycles is in the hands of the Surplus Government Property Disposal Board, 6, St. James's Square, London, S.W.1, and on enquiry there we learned that, pending the formation of a definite scheme for the disposal of army vehicles, the Board has temporarily suspended operations. Previously, anyone



(Top) Motor cycles ready for sale and classified according to make. In the rear are new and rejuvenated machines in crates.

(Bottom) New and uncrated motor cycles. The great majority of these are Triumphs



and besides those of heaven. They have often been literally buried in the ground, and so a month or two's extra exposure will do them no further harm. Unfit motor cycles, as they are called, are those which have suffered severe accidents, have been run over and ditched, or have been hit and severely damaged by shell or machine-gun fire. We saw several interesting cases of the latter during our visit.

From time to time rumours have reached us that derelict army motor cycles have been sold minus

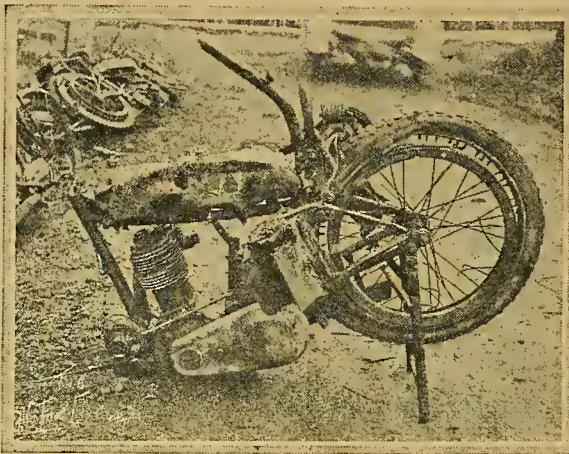
could apply to the Board, get a pass, and go down to Kempton Park to inspect the vehicles. Any reasonable examination was permitted, but, of course, no dismantling of any part could be allowed. We give a list of some of the machines in the sales park: 24 fit Rudges, 86 fit Zeniths, and numerous unfit machines, of which we may mention 17 Sunbeams, 96 Scott s.c. combinations, 36 Scott solo machines, 99 Zeniths, 23 Premiers, and 33 Rovers.

The Wastage of War.—

The question is—when will the Government move? The market is excellent now; second-hand prices are higher than they ever will be again, and, despite arguments to the contrary, the goods are depreciating. A few months hence, when new motor cycles will be available, second-hand prices may drop, so no useful purpose can be served by further delay. There was an auction sale of certain Kempton Park motor vehicles last week, but no motor cycles were included, and why this was the case no one apparently can give a satisfactory answer. It is quite time something was done. It seems clear that the R.A.S.C. has done its best. During the latter part of the war it has had to struggle along with men of low category; it has asked for the material with which to build sheds, but none was granted, as all that which was available was needed for the R.A.F.

The Disposal Board is alive to what is required, but can get no answer from the Ministry of Supply, and so it seems that this body is really to blame.

It has been suggested that it would be to the interest both of the general public and the trade if the manufacturers were to buy these machines, restore them to new condition, and sell them under a guarantee, and we understand that the manufacturers have been approached, but have not made an offer which the Board could accept. The whole question, therefore, remains in abeyance. The matter is an urgent one, as the motor cycles are bought from funds supplied by the taxpayer, and he rightly demands that they should be disposed of in the most advantageous manner.



A shell-battered motor cycle which might well form one of the exhibits in the projected National War Museum.

The motor cycle manufacturer and rider, too, have a right to be considered. If the machines were released at once before the manufacturer is in a position to supply, many riders would be able to obtain machines who otherwise would have to wait. This would not interfere with the sales of manufacturers, for at the moment there are few who have machines for sale, and it will be some time before they are abreast of their orders. If, however, the Government machines are allowed to lie idle until the manufacturers are able to produce in quantity it is quite possible that the trade in new machines will be damaged. Moreover, the prices obtained will be much less than if the machines are sold without any further delay. At the present moment second-hand prices are high, but this will not continue indefinitely.

There is in our opinion one class of rider who should have special consideration, viz., the man who enlisted as a D.R. early in the war and sold his machine at a reasonable valuation to the Government. It seems to us a mere matter of justice that such a man should have an opportunity of replacing the machine which was devoted to the service of the country at a similar price, instead of having to pay out a much larger sum of money to obtain an equally sound machine. This does not mean that we think that the Government should give away its property at prices far below their actual value—the difference having to be made up by the taxpayer—but only that the class of rider to whom we refer should receive the consideration which is obviously his due. He must not expect a bargain, but a fair machine at a fair price.

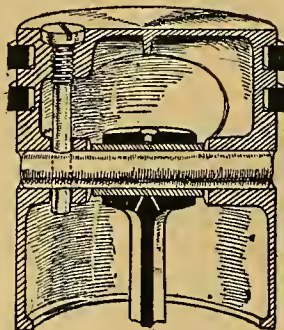
PAST AND FUTURE.

ARE manufacturers awake to the coming condition of things? Are any of the firms who are really in a position to produce the right vehicle by the thousand making any preparations to do so? The cycle car has not proved a success in the past simply because it has lacked the support of those influential firms who might have made a success of it. It was left to little experimentalists in back street factories, and in the one or two instances where mechanical success crowned the efforts of reputable firms, financial success was impossible owing to the bad name the vehicle had won at the hands of others. Light, flat-twin engines are now being made which render the cycle car more practical than ever before, and in itself it is a practical type of vehicle, demanding only commonsense methods and proved and well-tried principles. There is no need for new departures, absolute simplicity and proper weight distribution being the two fundamental points. Who is to be the first to take this gigantic market of the machine for the multitude?

CHINOOK.

ANOTHER GUDGEON FIXING DEVICE.

MANY and varied have been the methods devised to secure the gudgeon in pistons and prevent endwise movement which would be liable to cause scoring of the cylinder walls. The makers of



The Vermorel gudgeon pin fixing.

the Vermorel car have an idea which is rather unorthodox, and consists, as shown, in passing a locking pin through the gudgeon boss and pin from the top of the piston crown, into which it is screwed. This method appears to be both simple and reliable, but we should anticipate difficulty in extracting the locking pin after any considerable exposure to the heat of the combustion chamber.

Electric Lighting by Dry Battery.

Points to be Considered in Choosing an Electric Lighting Outfit.

The advantages of dry cells over accumulators are set forth in the following article, which also shows that when illumination is only required for short intermittent periods a dry battery even scores over a dynamo lighting set.

DESCRPTIONS of, and experiences with, electric lighting sets have appeared in *The Motor Cycle* on several occasions. Up till now, however, the writer has only seen reference to those of the dynamo-cum-accumulator and the solo accumulator types. Lighting by dry cell seems to have been almost entirely ignored, and as this type of battery has much to recommend it, it is only fair to give it an innings.

The great merit of the dry cell is that, once it is installed and wired up, it requires no further attention whatever during its life. It is absolutely reliable, as witness its use to operate switchboard controls on large central station power plants. When it is run down the cost of a replacement is not a serious item—in fact, the outlay is very often less than would have been incurred in paying for the charging of accumulators, in cases where no dynamo is fitted, taking both types as in use for the same period.

Attention Required for Dynamo Lighting Sets.

Even when a dynamo lighting set is properly installed, it requires a certain amount of attention if it is to give good results. During the summer months, for instance, the accumulators must be discharged and recharged at regular intervals unless much night riding is indulged in. On a motor cycle an occasional discharge must be specially arranged for either by switching on the lamps during the daytime or by connecting the accumulators to a resistance taking a known amperage.

It is when lights are required only for short distances that the virtues of the dry cell are chiefly manifest. It can—if of reliable make—be left unused for long periods without deterioration. This cannot be said of the accumulator, which must, for its health's sake, be charged every four or five weeks whether used or not.

Four-volt and Six-volt Sets.

The writer has two dry cell sets in use—one six volt on a Rudge and one four volt on a Douglas. The batteries are both Volex, obtained from Messrs. Ward and Goldstone, and have given satisfactory service, particularly the six volt cell, which has been in intermittent use for nine months, prior to which it stood on a shelf for three months until time could be found to fit it up. It is still going strong, and, judging by the light given by the lamps, has lost little of its capacity. The four volt cell has not done so well; it has only been in use about three

months, and is already showing signs of falling off. It will still, however, furnish sufficient current to supply what light will be needed during the spring and summer, thus giving nine months' lighting for a cost of 6s. Neither battery has had any attention whatever—in fact, the lid of each case has never been removed since put on in the first place.



The flexible metallic cable can be clipped to the head of the machine in the tube through which the leads are run. When disconnected the terminals of these leads are clamped under a convenient thumbscrew. This equipment is shown fitted on the writer's Rudge.

The Boon of Electric Lamps.

Those motor cyclists who up to now have only used acetylene lamps can have no idea what a boon it is to be able to wheel the machine out of its shed and for both lamps to spring into light with the touching of a switch. The time taken to light acetylene lamps, including that spent in cleaning and recharging the generator, is in many cases just about the same as that taken by a rider whose machine is equipped with electric light in travelling the three or four miles to his destination. In addition, a little ordinary care taken in the initial wiring up makes the possibility of roadside stoppages on account of failure of light very remote.

The set as fitted to the Rudge is shown in the first illustration, and it will be seen that its fitting up is somewhat unique, inasmuch as the battery and head lamp are both mounted on one common bracket. This bracket was made out of a P. and H. set by cutting off the lugs which normally carried the acetylene generator and brazing a strip of 14 s.w.g. sheet steel, $\frac{3}{4}$ in. wide, on top of each arm, to form a platform for the battery box, which is secured to the platform by a number of wood screws.

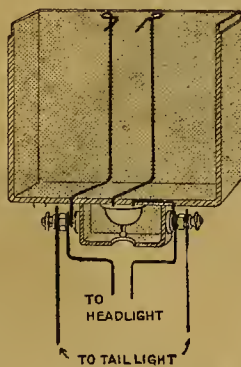
The battery box is made from mahogany, $\frac{5}{16}$ in. thick, with a loose lid held down by hook catches, the battery being tightly packed in with horse hair.

An Unusual Position for the Battery.

The complete unit is carried on the handle-bars, and, though at first sight it appears rather ungainly and top heavy in this position, no trouble has been experienced with it on this score. It must be admitted that on greasy roads its weight can be detected, but it has never caused a skid, and it is very convenient to be able

to remove head lamp and all during the summer months by simply undoing two nuts and slackening off the milled nuts which secure the wire leads running to the tail lamp.

Double wiring is used throughout, thus eliminating a common source of trouble with low voltage sets due



The wiring of the dry cell electric lighting set.

Electric Lighting by Dry Battery.—

to faulty connections at clips and suchlike places when the frame of the machine is used as the return circuit.

A square-shaped sump or well on the bottom of the battery box serves two purposes; it is a cover for the switch, which is of the miniature tumbler variety, and it also carries the terminals whereby both lamps are connected to the one battery. The wiring diagram will make this clear. A hole is cut in the bottom of the sump just large enough to allow a finger to be inserted to operate the switch knob.

Little Outside Wiring.

Outside wiring is reduced to a minimum. One short length of twin workshop flex, carried in a piece of rubber tube for extra protection, permanently connects the head light to the terminals previously referred to. The twin wire to the tail lamp is carried in a length of flexible metallic tube. The leads from the battery to the switch, etc., consist of the inner members, thinly rubber insulated, of twin flex after all the cotton covering and serving has been stripped off. They are run in grooves cut in the inside of the battery box, and are kept in place by a strip of thin leather glued over the top of them.

Both lamps have been converted from acetylene. The head lamp carries a 6 c.p. small bayonet bulb taking 1 ampère, and the tail lamp a 3 c.p. small screw bulb taking $\frac{1}{2}$ an ampère. All ventilation holes in the lamp body have been stopped up, to exclude dust, by brown paper stuck down with black spirit varnish.

The paper is well painted over with the same preparation. This makes quite an efficient job, and by suitably snicking and cutting the paper at the edges it can be made to fit quite snugly round the curves of the lamp.

When the top cowl was removed, a hole was left in the lamp top which was too large to seal satisfactorily with paper, so a sheet of aluminium had to be beaten to shape and riveted in place.

Reflector Experiments.

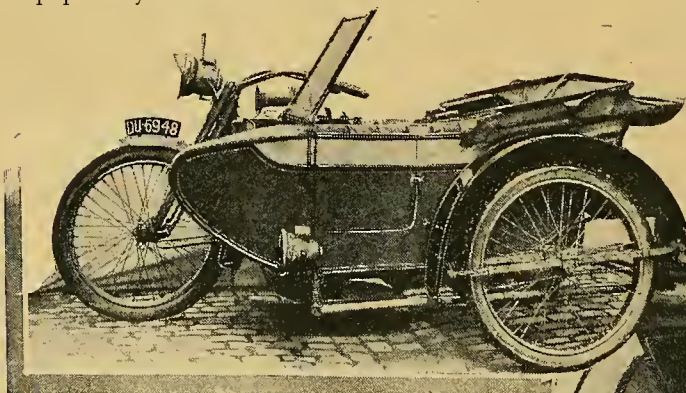
The head lamp was fitted with a Bausch and Lomb lens mirror. This was retained, although its efficiency is not so great as that of the parabolic type of reflector usually fitted to electric lamps. This is due to the former not collecting all the rays of light from the white hot filament of the bulb which the latter, owing to its position, does. To obviate this loss as far as possible the experiment was tried of silvering over—as a mirror—the front half of the bulb, so that the rays which would have passed straight from the bulb through the front glass are thrown back on to the lens mirror and thence projected forward. The experiment has been quite successful, and, considering the low candle-power of the bulb, the illumination obtained is quite good; 20 m.p.h. on open country roads can be safely indulged in.

The bulb and its holder, of course, are fitted vertically in the body of the lamp, and their shadow can be clearly seen on the obscured front glass when the light is on. There is, however, no noticeable blind spot in the beam caused thereby. F.B.S.

COMFORT IN SIDECARS.

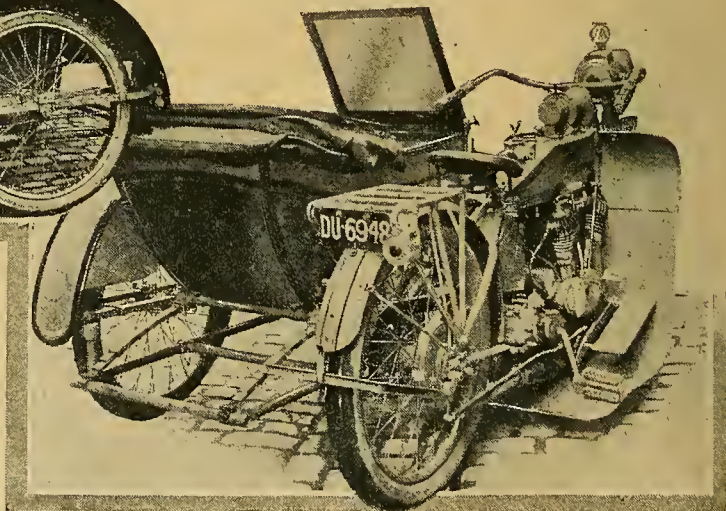
COMFORT in sidecars is almost as important as comfort on the saddle, and any device which makes for the benefit of the lady passenger will always be fully appreciated, and, incidentally, add to the popularity of the sidecar.

centre tax to the utmost any springing device of a sidecar or car, and Messrs. Grindlay must be congratulated on producing a springing system that has to be tested to be fully appreciated. No abrupt shocks could be felt even when passing over the worst of pot holes, a gentle rise and fall being the only motion noticeable. The body design is very pleasing. Aluminium panels and large car type mudguard give a distinctive finish which will appeal greatly to feminine taste.



The Grindlay double sprung sidecar described in our issue for December 5th. Note the semi-elliptic springs on each side of the wheel and the separate cantilever springs supporting the body.

A short run in the "Grindlay" proved that it is possible to construct a sidecar giving comfort equal to that of a well-sprung car; in fact, it was far more pleasurable than riding in some cars. The roads in a munition



OPINIONS.

Notes on the Past, the Present, and the Future. By Prominent Men in the Motor Cycle Movement.

THIRD SERIES.—Comments of Designers and Others well-known to Motor Cyclists.

From Maj. T. W. Loughborough, Secretary of the A.C.U. and the British Motor Cycle Racing Club.

THE fascination of motor cycling, compared with any other form of locomotion—yes, flying included—has been explained, but the explanation, whatever it is, does not interest me so much as the fact that, unlike most of those pleasures which we, as a nation, are credited with taking so sadly, it does not lessen with use.

Having been debarred from the said road for so long, or, at least, being strictly limited to that portion terminated by home and the railway station or place of business, the fascination of motor cycling—free as the air—will, to us old-stagers, be redoubled. And for every pre-war motor cyclist reviving his old interests there will be more than one new recruit: men who have noted, during their service abroad, the marvellous efficiency of the D.R.'s mount, and others at home, men and women too, who have

saved up their war wages with a wise eye for the future. Given anything like reasonable conditions as to fuel supplies and the prompt removal of war restrictions, and I foresee a demand for new machines that will severely tax our manufacturing resources. Indeed, there is a danger that, in striving to meet this demand, the trade may so concentrate on pro-

Maj. T. W. Loughborough

duction pure and simple that it will lose sight of the fact that, of all classes of motor vehicles, the motor cycle is perhaps the most capable of improvement.

Possibly I am presumptuous; and if I could be taken at my word the result would prove that the trade is not so short-sighted after all. Nevertheless, I do feel that, if I were given a free hand in the drawing office and experimental department of one of the leading makers, I could remove some of the reproach contained in my last paragraph. The power unit and transmission as such would not worry me. I should approach the task from the owner's, and not the engineer's, point of view. I should keep before me a mental picture of the two machines I own at present. I should try and incorporate in my design everything that the rational driver requires, and not leave it to him to find room to attach anything—more or less permanently—afterwards. I should be ashamed if I could not hose down and polish up my completed product in less time than it takes my neighbour to clean his car.

From Mr. Tom Silver, Pioneer Rider at Home and Abroad.

PROBABLY design is the bedrock upon which every practicable measure of reconstruction will be founded, and it is certainly not a process which can be delayed.

In pre-war days, before the use of the motor cycle became as prevalent as it is to-day, manufacturers had not considered the possibilities of pressed steel and die castings in construction. However, it has now become evident that these will play an important part, and no doubt the trouble will not be in the disposal of the product, but in the production, where cheaper and quicker methods should be looked for, especially in making a medium or low-priced outfit.

In 1919 it should be possible to purchase a better outfit at the same cost as in 1914. It is plainly evident to all that the experience gained during the war can be adapted to replace the conventional construction of a motor cycle, and so enable manufacturers to make their product of the design required, viz., a foolproof, weatherproof, sprung frame.

From Mr. A. J. Wilson, an Early Motor Cyclist.

AT the end of twenty years of motor cycling I am still hankering after a really lightweight runabout motor cycle upon which to do short rides for which it is not worth while to get out the car—a machine to be carried inside an office door and forgotten until wanted for an immediate journey, but then dependable to start without trouble; to require little more attention than the push bicycle, so long as it be not over-driven.



Mr. A. J. Wilson.

From Mr. J. E. Greenwood, Chief Engineer, John Marston, Ltd., Sunbeamland.

THERE is one feature of the post-war trade that has struck me very forcibly. It is the absence of anything indicating which is likely to be the most popular post-war model.

In pre-war days there is no doubt whatever that the $3\frac{1}{2}$ h.p. single-cylinder machine was far the most popular machine on the road. The chief reasons for this were that it was the most highly developed type, and the type that was being turned out in the largest numbers, by the largest number of makers. Another strong argument in its favour was its unassailable position as the double-purpose mount pre-eminent.

If past experience is any guide to the future the most popular post-war model will be the double purpose machine. Assuming that this is so, we are faced with the question of what type of machine it will be. There will be the ever-popular single, the V twin, and the horizontally opposed twin all fighting for premier place. For solo work both the V twin and the horizontal twin are delightful to ride, and certainly more sweet and vibrationless than the single; but when the machine has to tug a heavy

sidecar about there is, to my mind, nothing to compare with a good single. I am, of course, speaking of machines of about 500 to 600 c.c. I have ridden a good many twins of about 600 to 650 c.c., and although they are very nice to ride, they seem to lack the pulling powers of a good 500 c.c. single. The chief reasons why the single is the ideal double-purpose machine are: It is very easy to keep in good order, it will (if reasonably handled) run a very long time without requiring any adjustments or repairs, and it is probably the most durable engine made.

Regarding the most popular size of engine for the double-purpose machine, some people think that the $3\frac{1}{2}$ h.p. is not quite powerful enough; but when one considers the really wonderful performances put up by standard $3\frac{1}{2}$ h.p. sidecar combinations in open competitions there does not appear to be any necessity to go to a larger size engine.

The consideration of engine sizes brings to mind another matter about which there has been much controversy. I refer to the merits (or otherwise) of the long stroke engine. Personally, I do not think there is much to choose between a so-called long stroke engine and an engine having equal bore and stroke. My reason



Mr. J. E. Greenwood.

Opinions.—

for this statement is that, within the limits of the average motor cycle engine, it is impracticable to use a stroke-bore ratio higher than about 1.3 to 1.

Although theoretically there is an increase of efficiency with a long stroke, the real practical gain is so small when the ratio is limited as above that it is not worth arguing about.

From Mr. Leonard B. Henderson, A.M.I.A.E.,
Managing Director of Henderson Sidecars.

THE matter of reconstruction, in my estimation, will be a colossal task, and great industrial and commercial questions will have to be settled by the new Parliament.

Britain for the British, and British markets for British industries, should be an outstanding feature in future, this being the biggest question in the reconstruction of industry. In the past the British markets have been flooded with motor cycle fittings, accessories, and other goods exported by Germany and her allies, most of which had been manufactured with the express purpose of deceiving the buying public. The unwary have purchased the "goods," no doubt under the impression that they were British (owing to the inefficiency of the Merchandise Marks Act), only to find after short use that their purchases were worthless and unfitted for the purpose intended. Can anyone say that that the British standard of quality has ever been equalled? Impossible.

Therefore, it is the business of the new Government to instil into the public at home and Overseas the sterling qualities of British goods.

I feel that the motor cyclist should really be protected against the allurements of cheap and shoddy articles, whether produced in a foreign country or here in England. In the period to come I am convinced that all such shoddy, badly



Mr. L. B. Henderson,
A.M.I.A.E.

designed, horribly made, motor cycle goods will be eliminated owing to the fact that the motor cycling public are getting more educated to the belief than ever that a good sound article is always worth a little extra.

That the war has taught the nation something applies to industry also, and the motor industry comes in first. After-war motor cycles, sidecars, accessories, etc., will differ greatly from the old. Brains have been far from stagnant, and each day we hear of great inventions which show much promise, and which no doubt will, more or less, cause a revelation in statistics. New engines, on well tested and highly efficient aero engine lines, are already with us, and promise to end for all time the defects of pre-war design.

It is quite impossible in this short space to detail the wonderful and varied developments in metallurgy during the past four years, this great advancement having

an inestimable bearing on the extra efficiency of post-war motor cycles. Unbreakable steel of a special alloy settles at once all valve troubles of the past. Steel of remarkable tensile strength will give double strength for half the weight compared with the old type used. Problems such as rust, corrosion, weather effects, etc., will be bogies of bygone days.

In conclusion, I do not think there is any further need for us to sing "Wake up, England!" in matters pertaining to motor cycling.

From Mr. Hugh Gibson, of the Clyno Engineering Co.

CHEAPER machines, more weather-proof machines, and an adequate supply of fuel, are three of the main essentials necessary to increase the popularity of motor cycling.

If British manufacturers are going to utilise to the full the increased facilities for quantity production, then, once we get over the reconstruction period, the output of motor cycles will be enormous, probably exceeding 150,000 per annum.

Fewer models and increased production mean cheaper machines for the public (and, incidentally, higher wages for the worker), and a policy of "one firm one model" will no doubt be adopted in the future by all the most progressive concerns in this country.

By standardisation and concentration on one model, and by production in large quantities, motor cycles will be produced very much cheaper than ever they were in pre-war days; but until the cost of material comes down to a more normal level the full benefit of up-to-date quantity production methods will not be realised.

Before long we may probably witness the amalgamation of a number of firms making a similar type of machine.

Suppose, for example, that the Triumph, B.S.A., Rover, Sunbeam, Norton, and Singer companies joined forces and concentrated on the production of one model, each firm making component parts for, say, 50,000 machines. An attractive model could be produced to sell at 30 to 35 guineas, and the price would create the demand and enable these firms to dispose of a much larger number of machines collectively than ever they could hope to do individually.

Amalgamation, co-operation, and concentration on these lines amongst the leading sidecar manufacturers would result in the production of a high-class standardised sidecar outfit that could be sold at 65 to 70 guineas. The output, of course, would be enormous, but the demand would also be enormous; whilst by these methods American competition could be met and defeated in most markets; and instead of our Colonies taking 90% of American-built machines, they would be glad to take 90% British.



Mr. Hugh Gibson.

From Mr. John Duffy, A.M.I.A.E., Designer and Director of the Valveless Two-stroke Engine Co., Ltd.

THERE are two features in motor cycle design which, to my mind, have not in the past received the recognition they merit.

The first of these is the loop frame. For years now the conventional practice has been to make the engine part of the frame structure, in which position it helps to support the load in addition to propelling the machine.

This is admittedly bad practice, and yet convention continues to override efficiency.

The frame should be of a structure complete in itself and capable of supporting the load whether the engine is in position or not, and there is hardly a type of motor cycle, either two-stroke or four-stroke, which would not benefit by the adoption of this principle.

Among the advantages of the loop frame are ease of assembly, high ground clearance (when used in conjunction with the outside flywheel), and an engine free from frame stress. This last is of particular importance on two-stroke machines, where the crank case joints require to be gastight.

The second feature is the outside flywheel.

The virtues of this over the usual type are so obvious as to require little emphasis from me. Accessible and adjustable big end bearings, better acceleration, smaller crank cases, less weight, and cleaner engines are patent to anyone who gives this subject a thought.

Why the outside flywheel should, almost without exception, be left to makers of flat twins and two-stroke engines is more than I can understand.

From Mr. F. H. Bluemel, Managing Director of Bluemel Bros., Ltd.

I AM pleased to take the opportunity afforded me by the Editor of *The Motor Cycle* to say a few words direct to the users of motor cycles and accessories, particularly relating to present and future output and prices.

I am afraid many have thought that immediately war conditions terminate the supply of goods will be renewed in quantities similar to those that prevailed before the war, and at prices somewhat approaching those of that period; but no doubt, by now, the majority have already been made to realise the impossibility of this.

In the first place, raw materials are not yet any cheaper than during the war, and, as far as I can see, there is no appreciable increase in output. This will no doubt be made shortly; but a great improvement is necessary in this direction before manufacturers like ourselves can hope to replace the greatly depleted stocks of accessories, and it will therefore be a matter of a few months before the



Mr. John Duffy



B.S.A.

MOTOR BICYCLES

TESTIMONY FROM FRANCE.

"The B.S.A., as you know, is standard in the French Aviation, which has many hundreds in use. I must say the poor machines have, on the whole, a very bad time and are driven very hard—the majority of their drivers had no previous motor cycling experience, are rather careless and 'fast'—everybody seems to ride them and to learn to drive on them, including officers—nearly always a sidecar is attached. Despite such drawbacks it is marvellous how the machines succeed in performing useful work in despatch riding, postal service, provisioning, and conveying passengers. One may say now that, before the B.S.A., all sorts of machines had been tried from small twins to big American Motor Cycles, and that under such handicaps they all failed to be of any real use.

"In conclusion, I feel I owe a debt of gratitude to the machine which has carried me so faithfully, through fair and through foul, for two years of war. She is still sound although a little disreputable looking, as you will judge from the enclosed photos."

Yours truly,

ROBERT SEXE,

Motocycliste Etat Major.

Catalogue Post Free.

THE BIRMINGHAM SMALL ARMS CO., LTD.,
SMALL HEATH, BIRMINGHAM.

SAFETY FIRST!

*Immunity from accident does not exist;
but the financial consequences are entirely
covered by the MOTOR UNION Insurance
Policy.*

*The motorist who drives an uninsured Motor
Cycle is endangering his bank balance.*

'Phone Regent 2200 or send a card for particulars to



10, ST. JAMES'S STREET, LONDON, S.W.1.

Under the auspices of the



Opinions.—

public can be sure of getting their favourite makes from the dealers' shelves.

Now a word as to prices. Labour is still costing more than double in pre-war times, and by a recent Act of Parliament the present rates must remain in force for the next six months, which fact means generally that, during the whole of this year, unless material gets much cheaper, which is not anticipated, present prices will more or less have to remain.

My advice, therefore, is that nothing is to be gained in delaying purchases in the hope of a speedy reduction in price; and in order to help to find work for munition workers, now that the majority of munitions contracts have been completed, and for the returned soldiers, it is a national duty to purchase what is really necessary.

From Mr. A. P. Young, Chief Magneto Engineer, British Thomson-Houston Co., Ltd.

AS I consider the future prospects in this country of the motor car, motor cycle, and other industries that depend on the use of a petrol motor, the predominant thought in my mind is that the development of these huge industries in the years that lie ahead will never again be solely dependent on high-tension magnetos manufactured in Germany. This striking transformation has been brought about by the greatest war in history, and it is not a very happy reflection—but nevertheless true—that it required an international upheaval of such magnitude to secure this tremendous result.

The British magneto industry is now a factor of vital importance, and it won its laurels during the war when the whole of its concentrated effort was applied to the development and construction of aeroplane magnetos of superlative quality for our Air Forces.



Mr. A. P. Young

The success that was achieved can be gauged by the single striking fact that when the Armistice was signed it was generally admitted by aircraft experts that the British Air Force in equipment and personnel was second to none.

Now that the war is all but ended the British magneto industry has with avidity turned its attention to the development and standardisation of all kinds of magnetos for motor cars, motor cycles, and other motor vehicles. The invaluable experience gained during the war in the design and construction of aeroplane magnetos will be reflected in the designs that will appear during 1919. From my knowledge of what has been and is now being done I can say that these magnetos will be better than the German product, and they should prove themselves superior both mechanically and electrically. I venture to predict that the experience of motorists on the road will confirm this view, which is based on an intimate knowledge of these contemporary designs.

From Mr. Alec S. Ross, Popular Clubman and Competitions Official.

WHEN our armies are finally demobilised, doubtless thousands of young men who, before the war, were satisfied with a town existence and a sedentary life will want something more vigorous, exciting, and manly.

Every one of these young men is a potential purchaser of a motor bicycle.

The yearly output of motor cycles in this country increased from about 6,000 in 1908 to something like 60,000 in 1914, but even now I am convinced that we are only on the fringe of the motor cycle movement. Factories must be enlarged and the output increased a hundredfold. Prices must come down eventually, but makers will be ill-advised if they sacrifice quality to low price. The ultra-cheap and shoddy machine will alienate many possible enthusiasts and do much harm to the industry and the sport. Low prices must be the result of improved methods of manufacture and large output.

From Mr. E. R. Troward, of Rider Troward and Co., the Hampstead Motor Cycle Dealers.

AS regards reconstruction as applied to motor cycle retailers, there is surely room for improvement and reform—more efficient service, better class second-hand goods, better over-guarantees.

Let us see that in setting our house in order we do not overlook the cleansing of the retail motor cycle trade. In pre-war days buying a second-hand motor vehicle was like buying a horse—one took an expert with one to avoid being "done." I know nothing about clothes, but I do not take a clothing expert with me when I go to my tailor for a new suit, nor do you take an expert with you when you go shopping at Selfridges or any of the big stores.

Therefore, let us see that the retail motor cycle dealer inspires confidence in his would-be purchasers, so that a novice may be able to buy anywhere without fear. The trade now has a very big future before it, and it is up to the trade to treat all customers well, and to give good workmanship and effectual guarantees, especially as regards second-hand goods, where guarantees now are mostly lacking.



Mr. Alec Ross.



Mr. E. R. Troward.

From Mr. Geo. Pettit, Proprietor of Maudes' Motor Mart.

AS an agent, the most sound advice I can give to a prospective motor cyclist is to buy now. As events are progressing, there appears little doubt but that the man who leaves his order until the sun shines will be left without a machine, new or second-hand.

During the year 1919 I think we shall see few startling models on offer, as most manufacturers are rightly keeping to the tried and trusted designs until they are free to supply something new which will, in, say, ten months' time, need every test to which a maker can subject a machine. But 1920 will be an eye-opener to every serious motor cyclist.

There will still be a few smaller manufacturers working on the old British principle of "individual output"—if I may use such an expression; and, provided these manufacturers turn their attention to a first-class product, their machines will still be in demand, since a number of buyers will always insist on some such special type of mount, even should the price be double that of a like machine manufactured on the quantity scale.

There is little doubt but that the motor cycle is coming into its own as the cheapest form of locomotion known in this country for either one or two persons.

From Mr. Harry Bax, of Godfreys, Ltd.

THE trade of a motor cycle agent necessitates dealing in second-hand machines. This second-hand business—with all its possibilities for sharp practices—is certainly open to improvement for the credit of the trade and the protection of purchasers of second-hand machines.

The buyer of a new machine relies on the guarantee of the maker; the purchaser of a second-hand machine on the guarantee of the agent—specific or implied. When, as in some cases, the value of this guarantee is limited to its advertising possibilities, the buyer suffers.

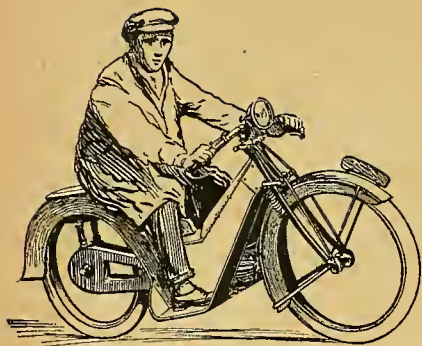
But the agent can, and should by actual examination of all working parts of every second-hand machine passing through his hands, make his guarantee of equal value to that of the manufacturer. He certainly cannot do it otherwise. In other words, it should be his business to reconstruct every second-hand machine so that his guarantee rests on a foundation of fact and not speculation.

That something should be done to make it less easy for the dishonest agent to exploit the novice, all who have the interests of the trade at heart will admit. How it is to be done is one of the problems of reconstruction.

A fourth selection will appear next week.



Mr. H. Bax



THE PRESSED STEEL FRAME.

A Midland Firm's Striking Departure.

All the plating, flanged for strength, is of stout gauge, the side plates being of lesser gauge than the top plates; the head is formed in a separate piece with side wings, to which the side plates are bolted.

The Engine Unit.

The engine unit is complete in itself—so complete, in fact, that when the chain and petrol pipe are disconnected and the baseplate unbolted, it can be entirely removed from the frame, carrying with it the two-speed gear box, magneto, silencer, and carburetter. No part of the engine unit is attached to the frame, yet so accessible is the engine that with the cover plate removed it is possible to make any adjustment, even to the removing of the outside flywheel.

The engine is of the four-stroke type and of 427 c.c. capacity, and is placed horizontally with side-by-side valves on top of the cylinder, but its general details we omit at present, as certain patents connected therewith are not yet completed. The same remark applies to the method of springing and adjusting the back wheel. That it follows car practice throughout and gives promise of excellent

results is the most we can say at the moment.

There are numerous other interesting details, which will be dealt with later. We hope to have a machine on test shortly, when our actual experiences on the road with this unique mount can be given. As it stands at present, it presents no particular difficulty; some faults may develop, but nothing which cannot be overcome. In this connection, the friendly criticism of readers of *The Motor Cycle* is invited.

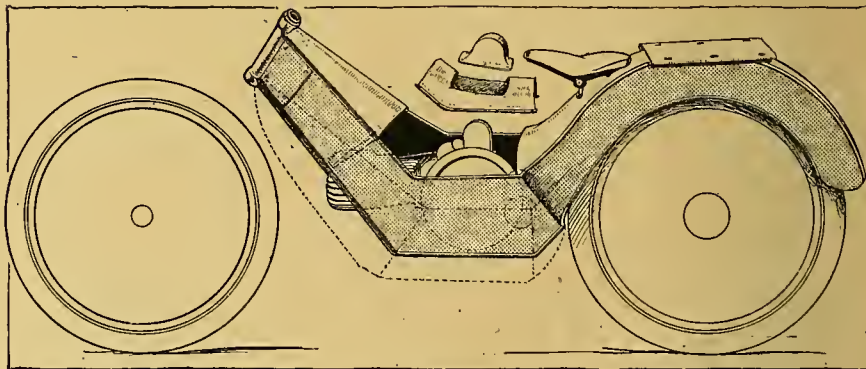
The designer has been particularly careful to obviate any chance of side play or want of strength at the head, engine plates, and rear wheel. The machine will be suitable for riders of either sex without alteration, and will be an undoubted advance on the point of cleanliness. The engine is completely shielded from the rider, and an ample dashboard and leg shields can easily be fitted, rendering the machine as nearly weatherproof as possible.

On the point of cost, whilst the preliminary models will certainly cost more to produce than a tubular frame, the saving when large numbers are built will be considerable.

THE pressed steel motor cycle frame has long been regarded as an ultimate development, but until recently there has been no particular tendency in that direction, in spite of the many advantages which, theoretically, it presents. We have, however, foreseen that the war-time experience of several of our motor cycle manufacturers with engine plates for aeroplanes would influence motor cycle frame design. Therefore it is of especial interest to find the makers of the Diamond motor cycles, D.F.M. Engineering Co., Ltd., of Wolverhampton, well advanced in the production of the first models of a genuine tubeless frame constructed entirely of steel pressings. Before proceeding further, it is as well to state that this firm is not yet in a position to entertain any enquiries relating to this machine.

A glance at our illustration shows what a distinct departure it is from usual practice. The novelty is not merely confined to the frame, but the engine unit also is unique.

The frame consists of two side plates carried right through from the head, downwards, to form part of the engine carrier, and, upwards, over the back wheel, to form strengthening valances on the back mudguard. The two plates are connected behind the head by (1) a segmental plate covering the petrol tank, (2) by the tank itself when in position, (3) by a removable plate over the engine, and again (4) by the back mudguard. The whole is completely stiffened by the engine unit baseplate, which is bolted in from the under side.

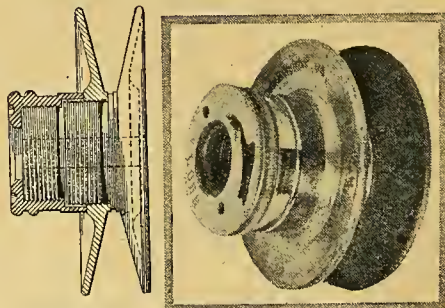


The frame design of the new Diamond motor cycle. Pressed steel is entirely to supersede steel tubing in its construction.

A SIMPLE ADJUSTABLE PULLEY.

NOT many of the usual fittings on a belt-driven motor cycle are more useful than an adjustable pulley. Even in these days of variable gears an adjustable pulley fulfils a very useful purpose. In the case of the older type of three-speed hub gears the adjustable pulley is just as useful as in the case of the combined belt and chain-driven motor cycle. In both these cases it allows the rider on approaching a hilly country to lower the range of all three gears, and will enable him to climb any hill with practically any load, and when the hilly country is left the tourist can again raise his gears, and so continue his journey in comfort.

The adjustable pulley made by Messrs. A. and E. Lower, 668, Seven Sisters Road, Tottenham, London, N.15, is a very simple and easily fitted device. In the



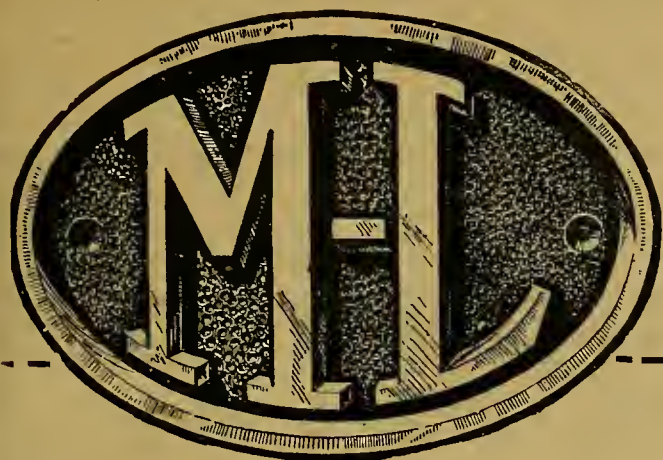
Sectional view of the Lower adjustable pulley.

Lower's adjustable pulley (lightweight pattern)

case of the lightweight pulley, it consists of an inner flange having a boss on which there are two threads. The thread nearest to the inside flange is left-hand; upon this the outer flange screws, while on the extreme outside of the boss is a right-hand thread for the cap that locks the outer flange in whichever position the rider desires.

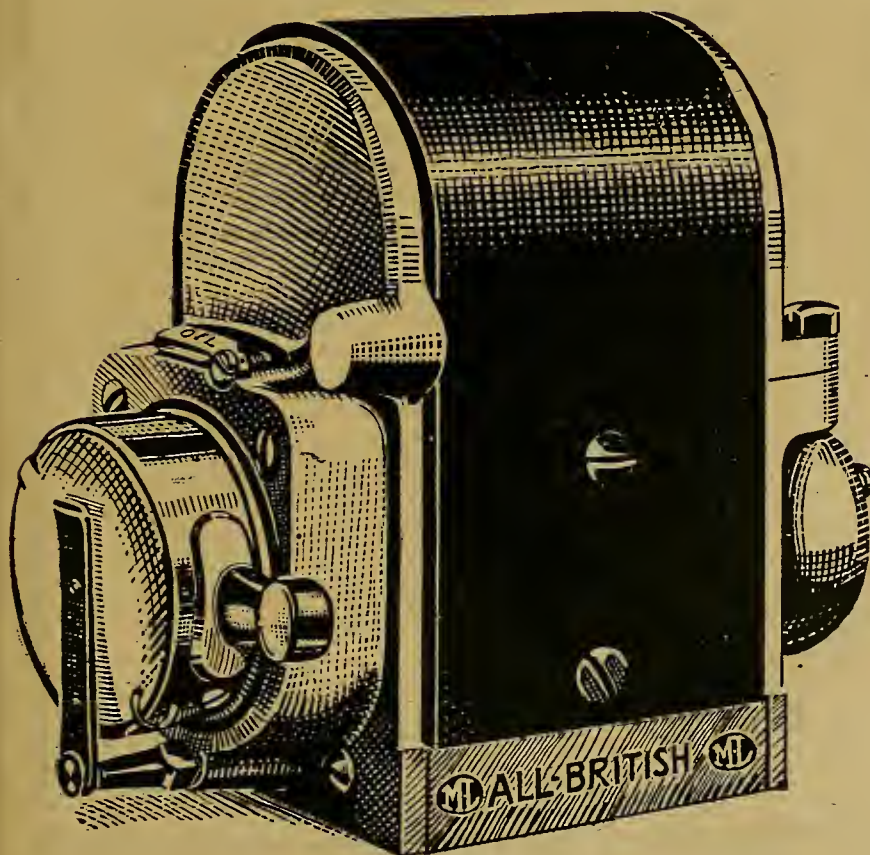
The larger size pulley is practically the same as the lightweight type, but in this case the boss is made of steel and screwed into the inner flange, so that in the event of either flange wearing or needing replacing this is easily accomplished.

The pulleys are manufactured in the following dimensions, 4in., 5in., 6in., and 7in., and they are also made for any size of belts and suitable for either side of the engine.



More than

60,000



M-L Magnetos have been supplied to Government Departments during the past three years — They have recently been made at the rate of over 800 per week.

M-L Magnetos have satisfied the most searching tests of Government experts, and have made a reputation for efficiency and reliability under the most stringent conditions. Quality Tells.

We shall shortly be in a position to begin regular deliveries of a complete range of M-L Magnetos for Motor Cycles from the lightest to the heaviest, and for any combination of cylinders.

The
M-L Magneto Synd., Ltd.,
Coventry.

In answering this advertisement it is desirable to mention "The Motor Cycle."



"The
World's Best
Motor
Cycle."

Sopwith

A.B.C. 1919 Policy

Mass production of 3 h.p. Model.

Detailed particulars and price of the A.B.C. will be published in a few weeks. When you see its principles of design you will realise that there are brains behind it and technical capacity far in advance of any other motor cycle engineering achievement.

The following are some of its leading constructional features:—

ENGINE—Air-cooled flat twin of 400 c.c. capacity, mounted athwart the frame. Mr Granville Bradshaw's unique experience with air-cooled aero engines has been employed to the fullest advantage in this remarkable motor cycle engine. Overhead type valves of the highest possible efficiency are fitted—improving fuel consumption by 10% and power by 15% over other inefficient types of valve mechanism. Again based on aero engine experience.

UNIT CONSTRUCTION—Engine, gear box, and clutch are one complete unit, and the whole demountable by simply releasing four bolts. The unit is self-lubricating.

SPRINGS—Leaf springing front and rear, with both springs in unison and correctly applied—giving perfect stability and high-grade car riding comfort.

GEAR BOX—The famous 4-speed gate-operated A.B.C. gear box as fitted to early war models.

LUBRICATION—Automatic lubrication on car lines. The only attention needed is to "fill up with oil once a month."

FRAME CONSTRUCTION—The secret "lightness in strength" has been applied to A.B.C. frame construction, being 30% lighter than previous practice, and at least 100% stronger with correspondingly greater resiliency and freedom from fatigue.

BRAKES—Self-adjusting mud-proof cone brakes in place of the inefficient contraptions common to the motor cycle.

KEYNOTE—

Design not Guesswork.

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LONDON, W 1**

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Works Kingston-on-Thames.

ENGINE EQUIPMENT.

MORE LESSONS OF THE PLEBISCITE.

Record of Readers' Votes on Various Items of Engine Specification.

IN last week's issue we dealt at length with the proportionate popularity of different types and sizes of engines. We are now able to go into details concerning other items of specification.

Space last week prevented our including in the long article on engines the result of the voting on such points as carburetters and magnetos. Considering that all cars have "automatic" carburetters, and that the single-lever control is very desirable from a simplicity standpoint, it is somewhat surprising to find that in both solo and sidecar classes the two-lever type is favoured by the majority. The voting on this point was as below:

	Solo.	Sidecar.
One-lever type carburetter	32.8%	41%
Two-lever type carburetter	67.2%	59%

From the foregoing it is apparent that the demand for the two-lever carburetter is more insistent from solo riders than from those who use sidecars. Since the solo rider usually is keen to obtain every ounce of power, this seems to signify that single-lever carburetters have not yet been generally proved to be so satisfactory as the two-lever type. On the other hand, the sidecar driver is more inclined to consider the advantages of a single-lever throttle control. It should be noted that included in the figures given for the single-lever are a large number of votes in favour of twist-grip control from riders of American machines, and that without these the figures would have been very much less.

Magneto Drive.

Despite the large numbers of machines on the road upon which the chain as the magneto drive is giving every satisfaction, gear-driven magnetos secured more votes in both classes than chain and shaft drive taken together. It is questionable whether a train of gears is the ideal transmission for the magneto. Every gear wheel has to be supported in two bushes, and the gears themselves tend to increase mechanical noises. In addition the cost is higher than a chain, and, in some cases, higher than shaft transmission. However, the gear-driven magneto is voted for by the majority, as will be seen below:

	Solo.	Sidecar.
Chain-driven magneto	34.1%	35.1%
Gear-driven magneto	54%	48.6%
Shaft-driven magneto	11.9%	16.3%

In considering the above figures, it is well to bear in mind that, as reported last week, the flat twin engine as a type scored 40% and 28% in solo and sidecar groups respectively. Most flat twins have gear-driven magnetos. As a matter of fact, only a minor proportion of the flat twin enthusiasts quoted chain and shaft transmissions for the magneto. Therefore, if

we take these figures into consideration, the gear-driven magneto on other types assumes a very different aspect.

Magneto Position.

The popularity of the flat twin also affects the voting in connection with magneto position, as the bulk of the forms specifying a central position are in the flat twin class. The respective popularity of the three positions is shown below:

	Solo.	Sidecar.
Before the engine	15.8%	12%
Behind the engine	44.7%	52.4%
Central	39.5%	35.6%

It will be noted that the proportion specifying a centrally-disposed magneto is less than the percentage of flat twins, in addition to which quite a large number of readers who voted for four-cylinder engines specified a central position for the magneto. This discrepancy is accounted for by the many flat twin adherents failing to register their choice in magneto position, no doubt assuming that an opposed twin must of necessity have the magneto between the cylinders. Others, however, apparently did not agree that the central is ideal, and specified a rear position, but without any comment as to the reasons thereof. There were also quite a number of readers who signified their preference for centrally placed magnetos on V twins, especially in the case of the 90° twin. Several, however, mentioned the central position for engines of 50° and 60°, but did not go further to state exactly how this could be done.

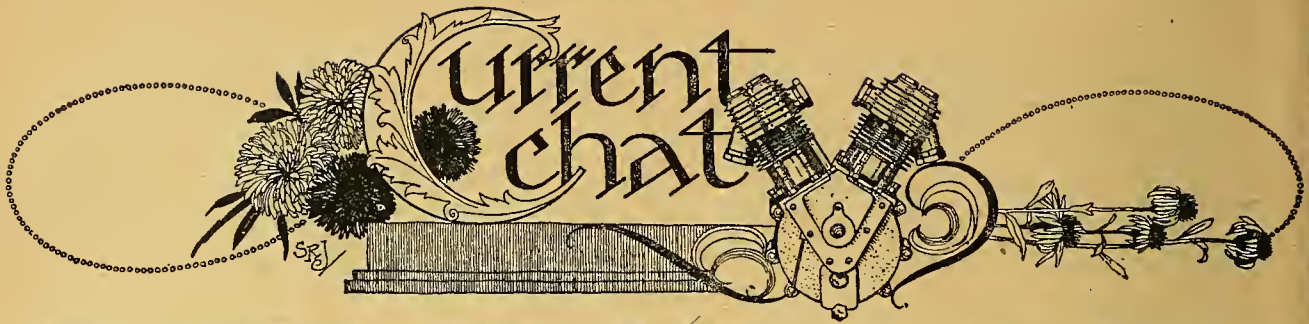
Lubrication.

On the point of lubrication readers are not so definitely in favour of any particular system. The greatest voting is in favour of the conventional hand pump and mechanical pump.

	Solo.	Sidecar.
Hand pump	26.4%	19.4%
Semi-automatic drip	19.1%	15.1%
Mechanical	23%	27.4%
Forced feed	14.6%	21%
Automatic	4.2%	6.3%
Throttle controlled	12%	10.8%
Petrol	0.7%	—

Quite a large proportion of readers specified combinations in which usually the hand pump was mentioned in addition to a mechanical or automatic system. The semi-automatic drip feed system evidently is not so popular with riders as it promised to be a few years ago. The low number of petrol advocates is due to the corresponding low number of forms giving the two-stroke engine as ideal.

Our next article on the plebiscite results will refer to gears and transmissions.



Times to Light Lamps.

GREENWICH TIME.

Jan. 16th	...	4.49 p.m.
" 18th	...	4.52 "
" 20th	...	4.55 "
" 22nd	...	4.58 "

A Thoroughbred.

A new make of single-cylinder motor cycle which, it is whispered, will aspire to fame as a track machine, has been born in an aeroplane factory.

Mass Production.

Mr. Hugh Gibson, the well-known Bradbury and Clyno competition rider, in this issue suggests amalgamations of large motor cycle manufacturing concerns with a view to increasing production.

The £150 Proposition.

Those of our readers who are protesting against the rise in price of the *de luxe* sidecar and "threaten" to buy a Ford will be interested to know that this car is now £250 f.o.r. Manchester.

Opinions.

A third series of Opinions from well-known motor cyclists appears in this issue, and includes some interesting comments by men prominent in the "second-hand" business, who are anxious that this branch of the industry be placed on a better footing.

Imports and Exports.

Despite the consummation of peace, the value of exported motor cycles and parts continues to drop; but, although the value of imported parts is less, the total value of machines imported during December, 1918 (in spite of the prohibition on imports), is greater than for the same period in 1917. The figures for December of both years are here given:

IMPORTS FOR DECEMBER.

	1918	1917
Machines	£130	£22
Parts, etc.	£361	£1,669
Total	£491	£1,691

EXPORTS FOR DECEMBER.

	1918	1917
Machines	£22,046	£62,591
Parts, etc.	£23,671	£33,316
Total	£45,717	£95,907

The imports of machines and parts for the twelve months to December 31st, 1918, amounted to £22,479, as against £106,126 in 1917 and £176,015 during 1916. It is interesting to compare these with the 1914 returns, which give £187,676 for value of imports and £1,168,799 for the exports.

Price of Petrol in New Zealand.

A cask of eight gallons of petrol in New Zealand costs 27s. 6d., compared with the pre-war price of 12s. 6d.

A Scandal.

The position regarding war-worn motor cycles is most unsatisfactory. In this issue we give a number of photographs of these machines at Kempton Park and a review of the situation at the present time.

A New Motor Fuel.

According to *Oil News*, a petrol substitute has been discovered in Washington which, it is claimed, has greater thermal efficiency than the best petrol, and can be produced at less than half the present price.

The substitute has a kerosene basis, and is the result of more than five months' experiments conducted by Major O. B. Zimmerman and Capt. E. C. Weisberger, of the Research and Development Divisions of the General Depot at Washington.

It is claimed that the new fuel is odourless, tasteless, and non-corrosive, leaves less carbon deposit than petrol, requires less air or oxygen for combustion, and develops greater horse-power. The ingredients are cheap, and can be readily obtained, while the process of manufacture is simple. The fuel has been successfully tested in motor cars, motor cycles, and other vehicles propelled by internal combustion engines in both cold and warm weather, and under sudden variations of load.

Special Features.

WASTAGE OF WAR.
ENGINE EQUIPMENT.
BUYERS' GUIDE.

Exit the Ministry of Munitions.

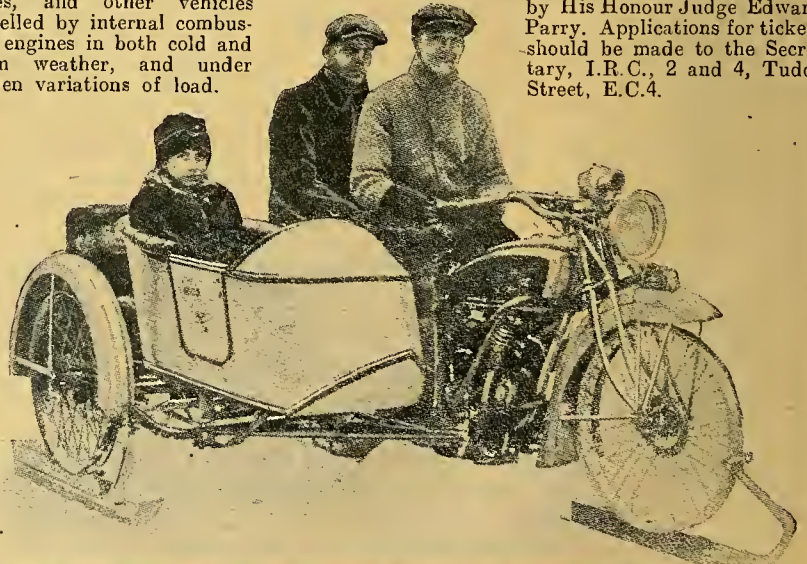
The Ministry of Munitions shortly will be known as the Ministry of Supply.

Pre-war Competition Awards

No doubt there are a large number of medals in the hands of club secretaries waiting to be claimed by motor cyclists who won them in the competitions of 1914. As a case in point, Mr. Weldon, secretary of the Nottingham and District M.C.C., is asking for the address of Flight-Commander W. D. Longton, who, before the war, was a successful competition rider. We would advise all readers who have such awards to their credit to apply for them from the club secretaries.

The Industrial Reconstruction Council.

The second lecture of the series arranged by the Industrial Reconstruction Council will be held in the Saddlers' Hall, Cheapside, E.C.2, on Wednesday, January 22nd. The chair will be taken at 4.30 by the Rt. Hon. Lord Balfour of Burleigh, K.T., and a lecture on "Industrial Reconstruction in Government Departments" will be delivered by His Honour Judge Edward Parry. Applications for tickets should be made to the Secretary, I.R.C., 2 and 4, Tudor Street, E.C.4.



In America many motor cyclists turn their outfit into a motor sledge during the long winter time. Runners are fitted to the front and sidecar wheels, and the driving wheel made non-skid by means of rope or chain.

Not a Hint.

"Ixion" wishes to convey his best thanks to "An Old Reader," who sent him a box of cigarettes anonymously.

The British Motor League.

We are informed that a meeting of the British Motor League will be held on Friday, the 17th inst., at the Pillar Hall, Cannon Street Hotel, at 2.30 p.m.

Motor Cycle Club for Swinton.

An effort is being made to form a motor cycle club in the Swinton district. Riders interested in the idea are asked to communicate with Mr. R. R. Garner, 254, Chorley Road, Swinton, Manchester, who is endeavouring to arrange an inaugural meeting.

Better Equipment.

There is a decided tendency among manufacturers to include better equipment in the specifications of their new models, and the policy of building down to a price appears to be entirely disappearing. Larger tyres and better saddles are almost general on machines which before the war were regarded as cheap lightweights.

The Central Committee of Employment.

The Central Committee for the Employment of Discharged Soldiers and Sailors was formed in 1915 to tackle the problem of finding employment for those men discharged from the Services who before the war were connected in any way with the motor industry. All those seeking work should write to the secretary, Mr. T. W. Loughborough, 83, Pall Mall, London, S.W.; who will put their names on the register, classified according to trade. A full list of men now seeking employment or information as to the work of the committee will be sent to anyone on application.

New Year Honours.

We notice the names of the following well-known motorists in the New Year Honours list:

Capt. W. O. Bentley, who in years gone by was a skilful performer on an Indian and won many hill-climbs, is now in the R.A.F., and has been awarded the M.B.E., Military Division. When war broke out he obtained a commission in the R.N.A.S., and distinguished himself by designing one of the most successful air-cooled aeroplane engines built during the war.

We notice that Lt. M. A. J. Orde, R.A.F., whose performances on a Rover were frequently recorded in pre-war competition days, and who was a prisoner of war in Germany for two years, has been promoted to the rank of Substantive Captain.

Capt. G. de Haviland, O.B.E., whose name, besides being associated with the early Blackburne motor bicycles, is well known in aviation circles, has been awarded the D.F.C.

Similar awards and honours have been granted to Acting-Maj. W. G. McMinnies, the well-known Triumph and Morgan rider, and Acting-Maj. Cyril Patteson, M.C., one of our most skilful and enthusiastic motor cyclists.

Capt. (Acting-Maj.) S. R. Axford has been awarded the O.B.E.

**THE DISPOSAL OF
ARMY MOTOR CYCLES.**

**Latest Developments up to
the time of going to press.**

Bargain hunters, whether private individuals, D.R.'s, dealers, or manufacturers, cannot purchase new or disused Army motor cycles at the present moment. The control is in the hands of the Surplus Government Property Disposal Board, 6, St. James's Square, London, S.W.1, and this body has temporarily suspended operations until a definite disposal scheme is formed. For the benefit of potential buyers who are looking with keen interest, not to say consternation, on the apparent muddle in the disposal of the nation's property, we intend each week to give in this column the latest information obtainable on the question. In last week's issue, and in the current number, the position up to date is very fully and clearly outlined.

New Rex Models.

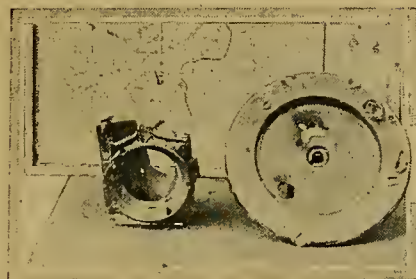
Two new models will shortly be placed on the market by the old-established Rex Co. These will be a 4 h.p. single with three-speed gear and chain-cum-belt transmission, and an 8 h.p. twin sidecar with all-chain drive. Both models will embody several new features.

Eastern Counties Motor Club.

Mr. J. W. Percival, of 5, Ruby Road, Walthamstow, honorary secretary of the Eastern Counties Motor Club, will be pleased to hear from all old members at the earliest possible opportunity, in order that a meeting may be fixed to arrange the club's programme and fixtures for the coming season.

Bradbury Peace Models.

As we are about to go to press we have received advance particulars of the Bradbury Peace models. These will include a 2½ h.p. lightweight four-stroke single, with engine 74.5 x 80 mm. (350 c.c.), two-speed countershaft gear and clutch, chain-cum-belt transmission, which will be offered at £63. The 4 h.p. single and 6 h.p. twin similar to the pre-war models at £82 and £100 also will be catalogued.



The danger that despatch riders and drivers of motor transport faced did not always come from the German trenches, as is witnessed by the Douglas flywheel and ambulance lamp, both of which were riddled by machine gun fire from an aeroplane.

American Prices.

The price of the Henderson four-cylinder machine in America is £80, or with full electric equipment £90 12s. The Excelsior twin is approximately £70.

The Peace Model.

The 1919 A.J.S. sidecar is £142 16s. and not £152 16s. as quoted in our schedule of prices last week. This price includes 700 x 80 mm. heavy Dunlop tyres, spare wheel and tyre, sidecar screen, apron, and stand.

**More Army Motor Cycles Awaiting
Disposal.**

Kempton Park is not the only place where disused Army motor cycles are awaiting disposal. A correspondent states that there are many at Grove Park, near Bromley, but here, unlike those at Kempton, the majority are under cover.

Motorists and the New Parliament.

Prior to the Election, the Automobile Association and Motor Union wrote to every candidate asking if he would be prepared to support (a) a modern and up-to-date Motor Car Bill introduced directly circumstances permit into the House of Commons under recognised auspices; (b) the reconstruction of the roads upon lines adequate and suited to modern transport; (c) active measures to assure a sufficient supply of fuel for such transport at a reasonable price, and to encourage the production of home-produced fuel as an essential to national security and prosperity. The total number of replies received were 341, of which 276 expressed entire agreement.

The Motor Cycling Club.

As previously announced in these pages, the annual general meeting of the M.C.C. is to be held on Wednesday, January 29th, at 6.30 p.m., at the Prince of Wales's Room, Pagani's Restaurant, Great Portland Street, London, W.1.

We have received a letter from Lt. Southcomb May saying that, as the result of the publicity given to the fact that the club thought of engaging a paid secretary, numerous applications have been made for the post. The M.C.C. Committee, however, has decided to postpone its decision for the present so as to give the club's own members still Overseas a chance of applying. In the meantime, Mr. Southcomb May is carrying on in his old capacity as hon. secretary.

The 1919 Blackburne.

We are informed by Messrs. Burney and Blackburne, Ltd., Tongham, Surrey, that the illustration of the motor bicycle which accompanies the paragraph appearing in our issue of January 2nd is not really a correct representation of the latest 1919 Blackburne, but is rather a suggestion of "the ideal machine" conceived by Mr. J. H. Holroyd, the firm's works manager.

We hope very shortly to be in a position to give an extended description of the new model Blackburne, the latest of a type which made its reputation for reliability before the war. It is worthy of note that the Blackburne motor cycle was spoken of most favourably in Maj. Watson's excellent book, "The Adventures of a Despatch Rider."

LESSONS OF THE TRACK.

Racing and its Effect on Design.

ANY discussion on the effects of the knowledge gained by racing and speed work on the design of the touring machine is rendered difficult by the necessity of clearly defining the differences between causes and effects so as to produce convincing arguments. The facts that the results obtained are so decisive and yet so easily affected by human element show that a clear analysis of the various points at stake are open to misconstruction. Generally speaking, however, the results obtained in the majority of cases are identical for racing and touring, with the exception that they are much more magnified in the former.

Evolution by Track Tests.

Latterly a great deal more attention has been paid to comfort than to speed, but at the same time the leading minds have continued to develop their theories on the track, and all the important results have necessitated experiments beyond the capabilities of ordinary touring mounts. Since practically all the real development in engine design has centred on the four-stroke cycle, a number of types have been brought forward with more or less success, current work becoming merely a question of perfection in details. The lessons learned from each experiment conceived as a means of perfecting a machine have invariably been introduced into the pleasure vehicle, resulting not only in its development but in improved methods of manufacture.

Machines have been seen on Brooklands, for instance, with compression ratios as high as 5 to 1 without exhibiting signs of pre-ignition and overheating—quite contrary to theory. The value of this lies in the demonstration of the fact that higher compression ratios may advantageously be employed, given suitable valve and combustion chamber design, on touring mounts.

Weight reduction has also become of importance, and this demands the employment of the highest class of materials. In an effort to decrease connecting rod angularity so as to permit of longer strokes without any greater loss in transmitting the explosive force to the crank pin, very long connecting rods become necessary. Chrome-vanadium steel has been successfully used for these parts, stressed up to 60,000 lb. per square inch. Steel pistons turned to $\frac{1}{16}$ in. at the skirt have proved satisfactory in every respect. These two important factors are receiving marked attention from designers. As regards the valve-in-head cylinder design many of the racing limits can be adapted to the touring engine without any ill effects, the reason being that in no instance does ordinary use demand such strenuous service; the throttle is never wide open for any length of time, consequently the volumetric efficiency is seldom at its highest, and the explosion pressure is necessarily diminished. The same theory holds good in the lack of urgent need for such extremely high engine speeds, and this allows of heavier reciprocating parts as a means of reducing the cost, without any apparent falling off in power.

The many attempts to increase engine efficiency have forced upon us a marvellous increase in piston

speed, and remarkable results have been obtained that would doubtless never have entered the designer's head when considering stock production.

As an important factor bearing on the matter of engine speed, not only the details of cam design but also valve timing have come in for a generous share of attention, and while experiments along this line are fairly easy, the wonderful results are demonstrated only by the fast-moving vehicle.

Timing the opening of the exhaust as early as 70° ahead of dead centre, and the closing of the inlet valve as late as 63° past lower dead centre, with practically no attention being paid to the closing of the exhaust and the opening of the inlet valve, within reasonable limits, have been proved thoroughly practical and efficient in touring use, as well as in racing engines, and to racing alone I believe this development is due.

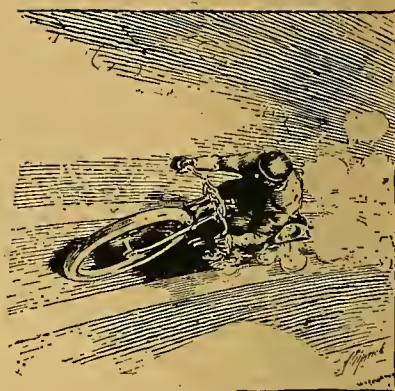
The Problem of Stresses.

Generally it may be stated that even in the midst of such examples of the modern designers' ability and the remarkable developments introduced by metallurgists, it has been surprising to note the new things to be learned at every race meeting. Prominent among these is the fact that so many undue stresses on the frames and engines seem to occur that cannot be calculated in any way, but are demonstrated plainly in a racing machine. This applies to all parts of the machine and illustrates fully that fatigue-resisting metals must be used practically throughout. Keys, holding gears that have pressed fits, and other minor parts such as small spindles and shafts that appear in ordinary carbon or nickel steels to be more than strong enough, considered from the standpoint of known stresses, will fracture frequently at varying periods. No doubt the same conditions prevail in touring mounts, but are often attributed to misuse or neglect, and occurring as they do at long intervals, the reasons are seldom sought and consequently the right conclusions never reached.

The Value of Track Work.

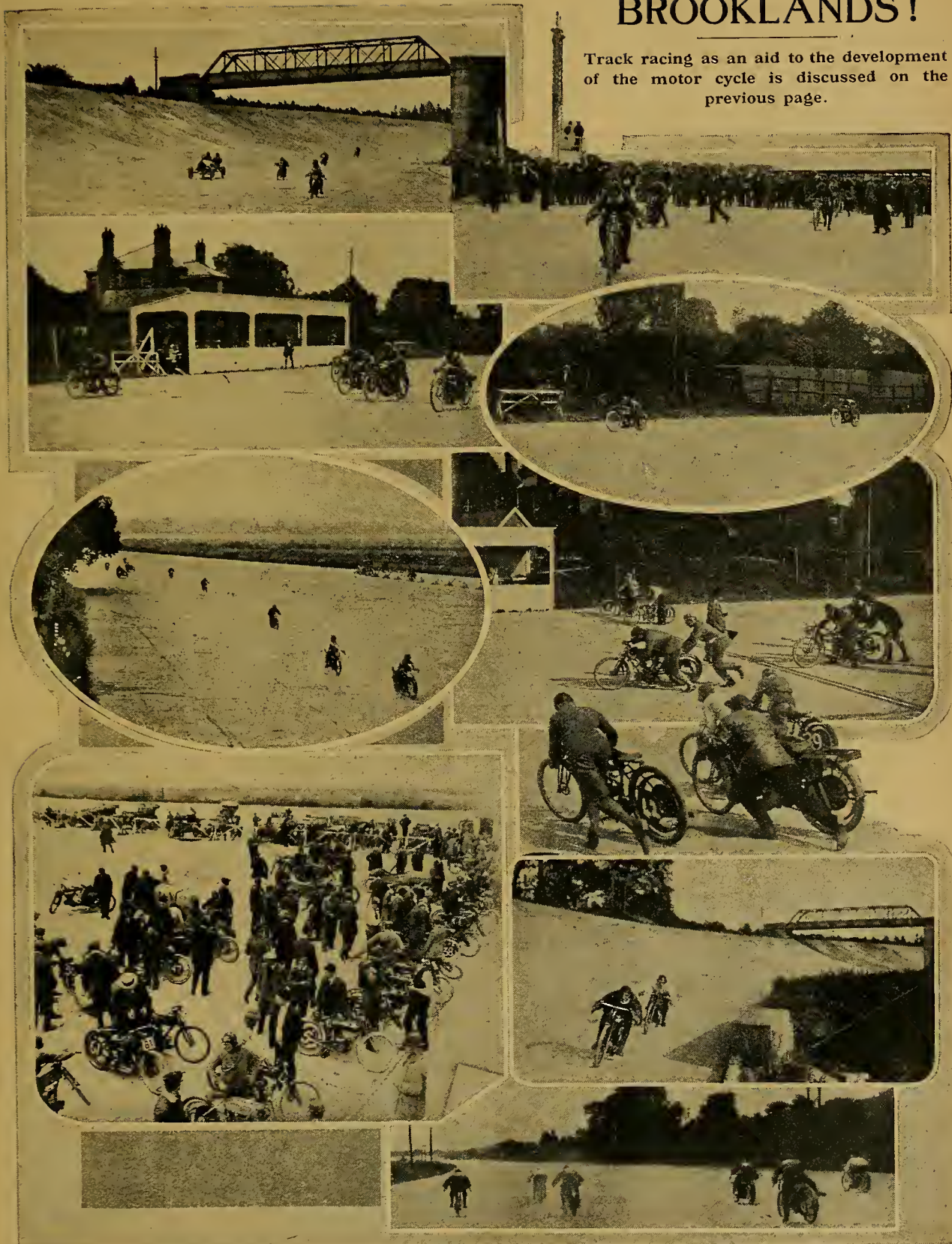
Although it may be that few actual designers personally participate in racing, the points that crop up, and are made public, in connection with track machines are found to be the subject of discussion by both trade man and amateur in almost every quarter, consequently, if the question be given fair and unbiased consideration, the statement that racing is directly responsible for the development of the modern motor cycle—which means that manufacturing facilities must keep pace with its progress—should be beyond contradiction.

MASCOT.



BROOKLANDS!

Track racing as an aid to the development of the motor cycle is discussed on the previous page.



THE BUYERS' GUIDE.

Current Prices and Delivery Dates for 1919 Motor Cycles.

Make.	H.P.	Particulars in Brief.	Price.	Delivery.	Make.	H.P.	Particulars in Brief.	Price.	Delivery.
A.B.C.	3	Spring frame.	£ 70 0 0	May.	L.M.C.	3½	3-sp. countershaft gear.	£ 73 0 0	Delivery at end of January.
A.J.S.	6	Twin, 3-speed.	106 1 0	End of	L.M.C.	4½	Ditto.	75 0 0	
A.J.S.	6	Sidcar combination.	112 16 0	January.	L.M.C.	6	Twin ditto.	86 10 0	
ALLON	2½	2-stroke, 2-speed, clutch	55 0 0	January.	MATCHLESS	8	Combination.	140 0 0	January.
ALLON	2½	2-stroke, 2-speed, clutch and kick-starter.	65 0 0		METRO-TYLER	2½	2-stroke, 2-speed.	45 0 0	
ARIEL	3½	3-speed.	80 0 0	January.	MORGAN	8	M.A.G. engine.	132 12 0	Delivery commenced. Entire output for 1919 booked by various agents.
ARIEL	3½	Sidcar combination	106 0 0		MORGAN	8	G.P., J.A.P. engine	143 17 0	
BLACKBURNES	2½	4-stroke, 2-speed, clutch.	60 0 0	—	MORGAN	8	De luxe, M.A.G. (w.-c. J.A.P., £8 8s. extra).	143 17 0	
BLACKBURNES	4	3-speed.	82 0 0	—	NEW IMPERIAL	2½	J.A.P. engine, 2-speed.	50 8 0	Delivery commenced.
BLACKBURNES	8	Combination.	125 0 0	—	NEW IMPERIAL	2	J.A.P. engine, 2-speed, clutch.	58 16 0	
BRITISH EXCELSIOR	2½	2-stroke, 2-speed, kick-starter.	56 10 0	February.	NORTON	8	Combination.	126 0 0	Delivery shortly.
B.S.A.	4½	All-chain drive.	81 15 0	Delivery commenced.	NORTON	4	All-chain drive.	87 0 0	
R.S.A.	4½	Chain-cum-belt.	79 16 0	Orders carried out in rotation as far as possible.	NORTON	3½	T.T. countershaft, all-chain.	85 0 0	
B.S.A.	—	Sidcar	29 9 0	Delivery commenced.	NORTON	3½	Single gear, B.R.S. engine.	73 0 0	Delivery shortly.
CALTHORPE	2½	J.A.P. engine, 2-speed.	52 0 0		NORTON	3½	Ditto with B.S. engine.	80 0 0	
CALTHORPE	2½	2-stroke, 2-speed	50 0 0	Delivery commenced.	NORTON	3½	Standard, T.T., all belt.	63 0 0	
DOUGLAS	2½	W.D. Model.	60 0 0		P. & M.	3½	R.A.F. model.	78 0 0	A limited number during Jan.
DOUGLAS	4	W.D. Model.	75 0 0	Delivery commenced.	P. & M.	3½	Combination.	102 0 0	
DOUGLAS	4	Combination.	95 0 0	It is hoped to commence delivery in January.	RADCO	2½	2-stroke, single gear.	42 0 0 (approx.)	Early in February.
ENFIELD	2½	2-stroke, 2-speed, chain-drive.	52 10 0		ROYAL RUBY	6 or 8	3-speed.	105 0 0	
ENFIELD	3	4-stroke, twin, 2-speed.	69 6 0	Early in April.	ROYAL RUBY	2½	2-stroke single gear.	40 0 0	Three or four weeks.
ENFIELD	6	Combination.	115 10 0		SPARKBROOK	2½	2-stroke, single-speed.	46 4 0	Early in February.
ENFIELD	8	Combination.	117 12 0	Shortly.	SPARKBROOK	2½	2-stroke, 2-speed.	52 10 0	
G.N. CYCLE CAR ..	10	2-cyl. Standard model.	140 0 0		SUNBEAM	3½	3-speed, all-chain.	—	Shortly.
G.N. CYCLE CAR ..	10	2-cyl. Vitesse model.	170 0 0	Delivery commenced.	SUNBEAM	8	Sidcar combination.	—	
HUMBER	3½	Flat twin, 3-speed.	85 0 0		TRIUMPH	4	W.D. Model.	88 0 0	Deliveries to agents commenced.
JAMES	4½	No. 6, single, 3-speed.	89 5 0	January. Out-put booked until end of March.	TRIUMPH	2½	2-stroke, 2-speed.	52 10 0	
JAMES	4½	No. 6, with sidcar.	115 15 0		VELOCETTE	2½	2-stroke, 2-speed.	40 0 0	Delivery in a few weeks.
JAMES	3½	No. 7, V twin, 3-speed.	89 5 0	January. Out-put booked until end of March.	VELOCETTE	2½	2-str., 2-sp., ladies' mod.	42 0 0	
JAMES	2½	No. 8, 2-stroke, 2-speed.	54 12 0		WOOLER	2½	2-stroke, variable gear.	61 19 0	April.
JAMES	5-6	No. 9, twin, 3-speed.	99 15 0		WOOLER	2½	Flat twin, 2-stroke.	61 19 0	
JAMES	5-6	Combination.	126 0 0						
LEVIS	2½	2-stroke, single gear	38 0 0						

NEW DATA REGARDING ENGINES.

Precis of Mr. L. H. Pomeroy's Recent Paper before the Institution of Automobile Engineers.

AN informative paper was read recently before the Institution of Automobile Engineers, by Mr. L. H. Pomeroy, dealing with the influence of valve area, revolution speed, and combustion chamber design upon horse-power and thermal efficiency. While the experiments which form the basis of this paper were of necessity conducted with large water-cooled, four-cylinder engines, the data obtained can be applied in no less degree to the smaller air-cooled engine of the motor cycle.

Experiments were carried out with two four-cylinder engines practically identical in design save in the arrangement of the valves, which were of the orthodox side by side type in one engine, and overhead in the other. These may for convenience sake be termed engine A and engine B.

The figures given by Mr. Pomeroy showed that in these engines the maximum b.h.p. obtained was largely independent of the gas velocity through the inlet valve, and that much higher gas velocities can be used than are common practice without adversely affecting the maximum b.h.p.

Engine B proved to be decidedly better in respect of m.e.p. than A, but in each case the calculated m.e.p. was fairly steady at the various inlet gas velocities,

and did not fall off appreciably, i.e., more than 5% for gas velocities up to 300 feet per second. It was also shown that the brake m.e.p.'s of the order of 95 lb. per square in. can be obtained with inlet gas velocities in the region of 300 feet per second.

The curves obtained showed that the consumption per b.h.p. rapidly falls with the increase in the inlet valve gas velocity, but rises again with a further increase in gas velocity as the upper limit of revolution speed is reached.

It is well known that turbulence is essential for both power and economy, but these tests indicated that in considering turbulence, inlet gas velocity must be regarded as to its relation to revolution speed or piston speed, and there is a certain minimum relation between the two which produces the necessary turbulence for approximately complete combustion at all speeds. The conclusions formed by Mr. Pomeroy in considering these results are:

- (1) That consumption is not directly related to inlet gas velocity.
- (2) That sufficient turbulence is developed to produce approximately complete and rapid combustion at quite low gas velocities.

- (3) That the improvement in consumption with increase of inlet gas velocity, shown by the curves, is related to revolution speed and not to gas velocity as such.

The general conclusion drawn from an examination of the results showed that the consumption of petrol per b.h.p. per hour is not materially affected by the inlet gas velocity in any prescribed number of r.p.m.

Mr. Pomeroy claimed that the chief advantage which might be expected in respect of the more compact combustion chamber in engine B is that the jacket loss during explosion and expansion would be less, and that part of this gain would be reflected in an increased m.e.p. The petrol consumption results, however, do not support this view, and show that, although the thermal efficiency increases with the speed, the actual consumptions are substantially the same in each engine at any given speed.

The principal lessons from the work done were, in the opinion of the author, the evidence of the high charging capacity of a small overhead inlet valve, and the comparative independence of consumption in respect of engine speed and torque for horse-powers up to fifty or sixty per cent. of the maximum.

CAMPAIGN

IT is vital to the Motoring Community that there shall be:

**STATE REGULATION OF PRICES OF ALL
MOTOR FUEL. STATE ENCOURAGEMENT OF
PRODUCTION OF MOTOR FUEL WHEREVER
POSSIBLE WITHIN THE EMPIRE.**

To obtain these advantages it is necessary :

- (a) *To press for immediate State action.*
- (b) *To obtain standard specifications for home-produced Motor Fuels.*
- (c) *To encourage production at home or within the Empire of industrial alcohol as a constituent Motor Fuel.*
- (d) *To combat, and obtain State assistance in preventing the danger of home-produced Fuels being manipulated or controlled by any Trust.*
- (e) *To obtain State prohibition of exports of home-produced Fuel except supplies surplus to national needs.*

CUT HERE

To the Secretary,

The Automobile Association and Motor Union,
Fannum House, Whitcomb Street, W.C.2.

*I undertake, as far as may be in my power, to assist in the
conduct of the Motor Fuels Campaign as outlined above.*

Name

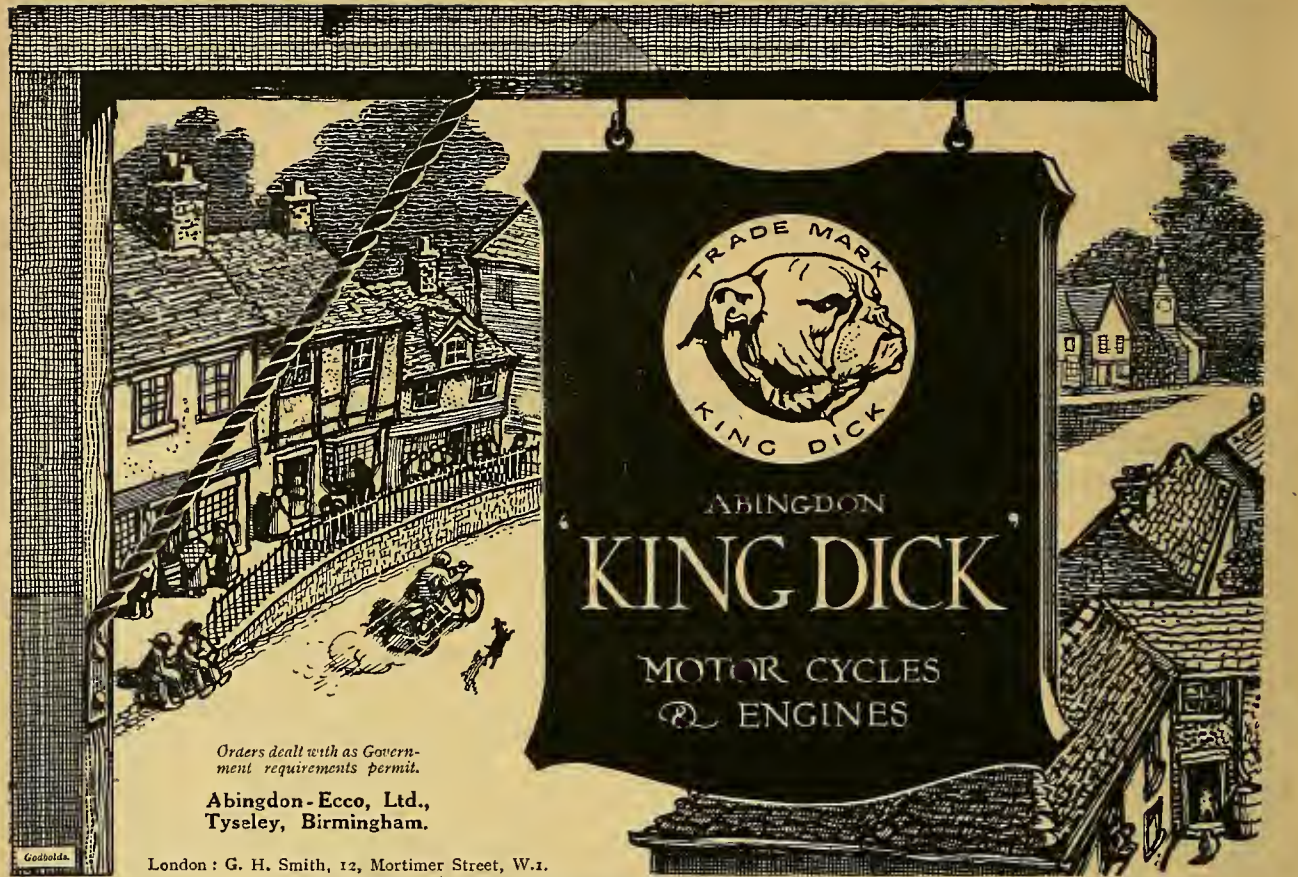
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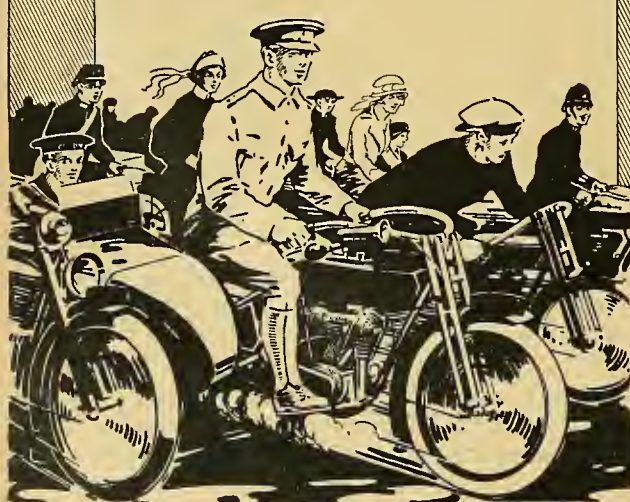
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It is all very well to picture that whirl through the countryside as one long spell of unbroken pleasure, but it is more practical to reflect on the possibilities of mishap and to anticipate the troubles that may arise. It is still more practical to arm yourself with all those "Motorities" which add to the joy and enable you to deal promptly and effectively with "troubles." It is not good to find yourself in difficulty just as the shades of night are falling and you at a spot "miles from anywhere." Be a "road-wise" motorist and equip yourself fully and efficiently at Dunhills.

Write, call or 'phone for the booklet "Dunhill's Motorities for Motor Cyclists"—there's nothing you need it doesn't contain.

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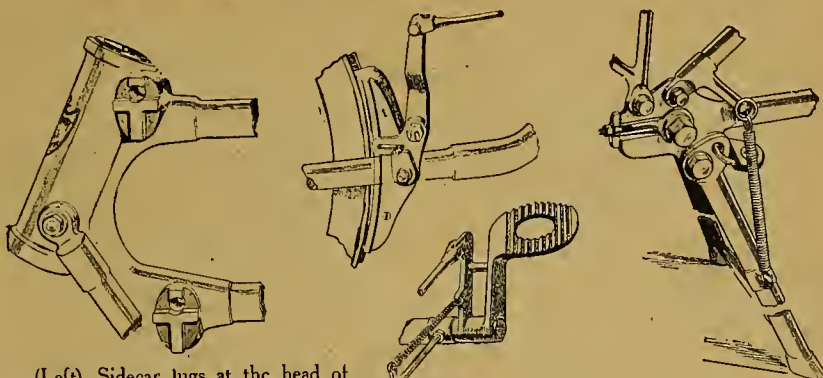
The Latest Royal Ruby Productions.

The Military Model with Additional Refinements.

THE Royal Ruby Cycle Co., of Manchester, have been engaged, like other motor cycle manufacturers, on munitions of war for the past two years or more, to the partial exclusion of their proper line of work. The transition of their new peace time programme is rapidly taking place, and regular production will shortly be assured.

The small two-stroke, well known in pre-war days, will continue to be produced as before. The larger model for heavy sidecar work will be a refined development of the military model, originally designed for use in Russia.

Substantial construction is its outstanding feature, and there are numerous special points in the design, including the eccen-



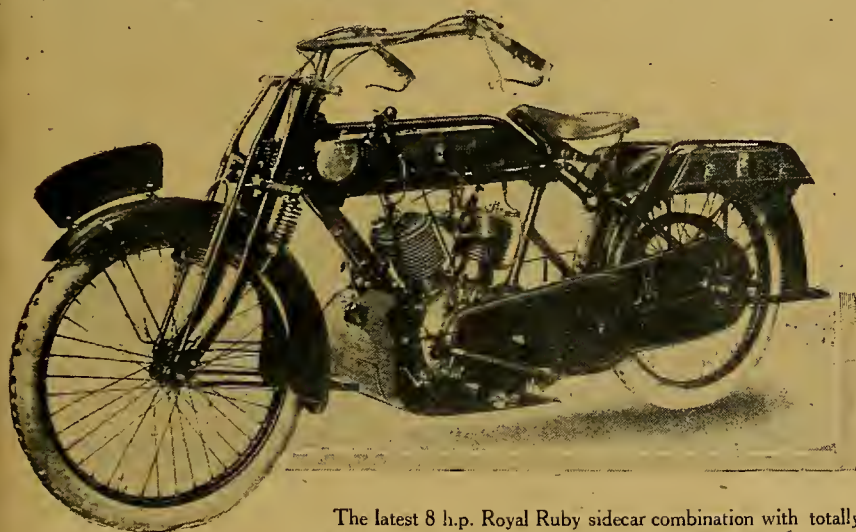
(Left) Sidecar lugs at the head of frame. Note the cross projections which take shearing stresses. (Centre) The rear brake with parallel action. (Right) Method of padlocking the stand to prevent theft.

tric movement provided to slide the gear box when making adjustments. Others are the triple front down tube; the interesting silencing arrangement; the safety stay strengthening the gear box bracket and seat-pillar tube; the ample carrier and easy method of completely removing it with the mudguard; adjustable footboards; large under shields and side shields; and parallel action for the rear brake. All these details are fairly well known. Among the later refine-

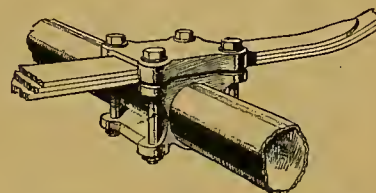
ments are the total enclosing of the chain drive, special design in sidecar lugs to avoid throwing the shearing stress on the bolts, and a neat addition to the rear stand whereby it can be padlocked in position to prevent the machine from being stolen.

Attractively Finished.

The Sturmey-Archer gear is to be embodied in future models. The familiar War Office drab green finish of the Russian models has been discontinued, and a more handsome appearance produced in black and red with gold lines. A spring frame model is in course of preparation, and extremely satisfactory results are being



The latest 8 h.p. Royal Ruby sidecar combination with totally enclosed drive and Sturmey-Archer three-speed gear.



A neat method of attaching leaf springs to the sidecar chassis.

obtained from the experimental machines. No doubt this model will shortly find a regular place in the firm's programme.

We illustrate a new means of fixing the leaf springs to the sidecar chassis—a marked improvement on the usual U bolts.

Altogether the machine is a substantial and thoughtfully designed model.

FURTHER DETAILS OF THE 1919 AMERICAN HENDERSON.

FURTHER details of the latest pattern four-cylinder Model Z2 Henderson motor bicycle are now to hand from the British agents, Messrs. Robertson's Motors, Ltd., 157b, Great Portland Street, London, W.1. Some preliminary notes concerning this machine were given in the issue of October 17th last year.

The cylinder dimensions are given as 70 mm. x 76 mm., totalling 1,168 c.c. The steel pistons are very light, having two piston rings, split bronze small end bushes lined with babbitt, and hollow gudgeon pins. The crankshaft is a one-piece drop forging with two end and one centre bearing. The valves are drop forgings of alloy steel, light and

very tough. The tappets are adjustable, the valve stems and tappets being provided with light dust-tight covers to eliminate noise. Both the crankshaft and big end bearings are split bronze, and babbitt lined.

The engine has been increased in size; it is better balanced, and will run more slowly than previous models.

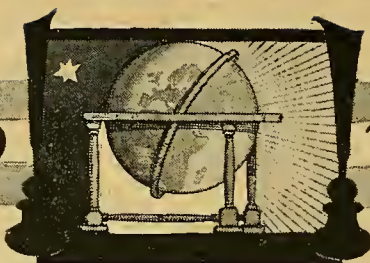
The lubrication is effected by means of a worm-driven oil pump, which supplies the lubricant to a large sump in the crank case, from which it is fed by splash through grooves and channels to all the working parts. To supply the engine with extra oil, an emergency auxiliary hand pump is fitted.

The three-speed box, which is integral with the crank case, has 4½, 7½, and 10½ to 1 ratios, which last-mentioned ratio should be low enough to enable the machine to climb any hill in the United Kingdom, when the power of the engine is taken into consideration.

The change speed lever, situated on the left-hand side of the tank, is provided with a locking device which prevents the gear from being changed till the clutch is disengaged. The kick starter is fitted directly to the gear box layshaft, and one stroke turns the engine over two compressions.

The tanks will hold two gallons of petrol and two quarts of oil.

LETTERS TO



THE EDITOR

The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Herford Street, Coventry, and must be accompanied by the writer's name and address.

LUBRICATION.

Sir,—Having read so much of late of the different systems of lubricating motor cycle engines and the different oil pumps designed for them, may I ask why more use is not made of the geared oil pump? In my estimation, it would be ideal. It would start and stop with the engine, which is just what is required, and a very small cylinder could be fitted on the pipe or oil way line, fitted with a plunger, say $\frac{3}{16}$ in. in diameter, which would come up above the top of cylinder about $\frac{1}{4}$ in. One could then tell if the pump were working.

I should like to know what readers of your valuable paper think about this.

H. WRIGHT.

A LONG STROKE TWO-STROKE.

Sir,—I have been waiting twenty years for a $3\frac{1}{2}$ h.p. long stroke, two-stroke engine. Is it ever coming along? I hate wearing valve guides, grinding in valves, adjusting them, chattering valve gears, etc. It seems to me that a very long cylinder has greater cooling opportunities, greater suction for gas, and the sweetness of running equals the flat twin. What is mechanically wrong with such an engine? Do you think I shall chance to see one before my three-score years and ten? (I am only fifty.) I should so much like to ride such a machine before I die. I want also very much to know what is against 12 in. mudguards? I do so hate to put my manicured hand up a tight-fitting valance to remove mud when the frost lifts; it makes me feel quite naughty. I also want two and a half gallon tanks and adjustable handle-bars, but the trade conspires against me.

R. R. RICHARDSON.

THE THREE-JET BINKS CARBURETTER.

Sir,—As the originator of the controversy anent the "dead spot" in the three-jet Binks carburetter, I would like to point out that my conclusions were not jumped at as the result of a single test on one machine. I believe I used my first Binks instrument in the summer of 1911, and I have been using it consistently ever since on every type of machine from 2 h.p. to 8-10 h.p. twins. In all machines—they number thirty-seven to date, this "dead spot" has been a marked feature, only varying slightly according to the type of engine. Twins and two-strokes, with their more even induction impulses, did not show it so markedly.

I can quite understand that a four-cylinder engine would not show this bad feature very noticeably, but I do not think that my contention can be controverted by the result of a test on one machine. The fact remains that numbers of users of this instrument find this fault with it.

H. LINDSAY, M.B., CAPT. R.A.F.

LEAKAGE OF MAGNETISM.

Sir,—I have read with interest Mr. Wm. Alexander's letter in your issue for December 5th *re* leakage of magnetism.

It seems a pity that an otherwise good magneto should be spoilt by this trouble, when the remedy is simple, and the trouble can be cured as mentioned, or, better still, by a steel sprocket which has a brass centre, this being fixed to the magneto shafts.

In conclusion, it is extraordinary that the fault has never been rectified by the makers. Were it eliminated the Dixie would not only be a simple, but at the same time a good magneto.

J. P. J. CHAPMAN.

Sir,—When I first wrote you *re* leakage of magnetism, I knew I should have a good deal of criticism on this point.

Now to answer "Sgt. 274 (M.T.) Co." Admittedly the magnetism does not "alternate"; it could not do so. My

meaning was, it passes through the rotor and the laminated field alternately. I have fully taken into consideration the position of magnets compared with other types.

Thirdly, that I have not located its peculiarity, I beg to differ, for it is curious that a brass sprocket cured it. It is also possible that a thousand magnets can be correct and the 1001st be wrong. Concerning other makes of rotating pole magnetos, I am not conversant with them.

I think this alone answers Mr. M. Clayton's letter, except for the condenser. I have not had trouble with this. It was not only examined, but my machine is in a centrally heated garage. Finally, my deductions have been drawn from my personal experience with and without a non-conducting sprocket wheel.

J. M. CHAPMAN.

THE FUTURE OF SURPLUS GOVERNMENT MACHINES.

Sir,—Having read the article by your contributor "Cantab" on "The Future of Surplus Government Machines" in *The Motor Cycle*, of January 9th, I should like to express my agreement with his conclusions.

Having seen the motor cycles, exposed as they are on Kempton Park racecourse, I am firmly of the opinion that no one except the makers of the various machines themselves could ever get them in proper riding order and satisfactory condition. Any speculator might buy 100 of these machines in the hope of completing seventy-five, but it would be a pure gamble. The seventy-five would even then not be likely to add to the reputation of their respective makers. Seeing all these machines are national property, it is in the national interest they should be put in sound condition by the makers for the Government at controlled profits, and offered to the motoring public by the makers, through agents, or otherwise, as a sound investment for any purchaser.

H. HASKINS.

ENGINE CAPACITY.

Sir,—The analysed census of readers' opinions upon the question of desirable cubic capacity is interesting, but in some respects a little misleading.

For one thing, it was not the average man in the street who sent in the bulk of the voting papers, but the enthusiast, whose tastes would generally sacrifice lightness to speed and power, even to an excess of the latter.

As a proof of this, if this voting were a final criterion, the sale of ultra-lightweights is finished, whereas we all know differently. Certainly the little machines have their faults, but there is a much larger proportion of people who will buy them than the voting indicates.

For another point, those who have voted so heavily for a 500 flat twin, or against a 350 to 400 c.c., are not exactly influenced by a desire for a big cylinder capacity, regarded from its point of size, but by a desire for the power that they expect to get from a 500 flat twin, as compared with the power that they expect to get from a 350 or 400 flat twin.

If any machine can give those voters that measure of power hitherto needing a 500, but give it from cylinders only measuring 400, and with corresponding decrease in weight, then it is safe to assert that the same riders would have voted for the 400 in preference.

Ergo, let us hope that the makers of the 350 and 400 machines will not be influenced by the statistics to drop their 350 and 400 models, but, instead, to develop the power of the 350-400 till it satisfies sporting riders more than did the pre-war models of that size. For the average tourist, the motoring equivalent of the "man in the street," the 350 c.c. mount was in 1914, and still is in 1919, as great a favourite as the 500 c.c.

FRANK WHITWORTH.

An Apology

To the thousand and more
readers of "The Motor Cycle"

who have written us concerning the

PREMIER

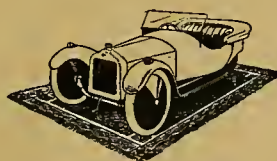
SUPER RUNABOUT

We wish to express our regret that we have been unable to send them the advance list for which they have asked.

The abnormal conditions prevailing at the present time are responsible alike for the printer's delay in delivering the list and our inability to cope with the correspondence.

Immediately the list is off the press the same will be forwarded. In the meantime, we invite others who are interested in a clean and efficient passenger machine to send their names and addresses

COVENTRY PREMIER, LTD.,
:: :: COVENTRY. :: ::
And 20, Holborn Viaduct, LONDON, E.C.



The Gap

in knowledge of
motor cycle construction



"The World's
Best Motor Cycle."

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Has the gap between 1914 and 1919 been stored with fresh knowledge of motor cycle construction? Are 1914 designs to be revived in 1919 with just detailed improvements?

We have stored the 1914-1919 gap full with motor engineering knowledge, and motor cyclists will have the full benefit of it in the A.B.C.

The 1914 standard of design is past history. The 1919 A.B.C. will make history. All the knowledge and unique experience gained in producing the A.B.C. aero engine—the world's masterpiece—are being used in designing the A.B.C. motor cycle.

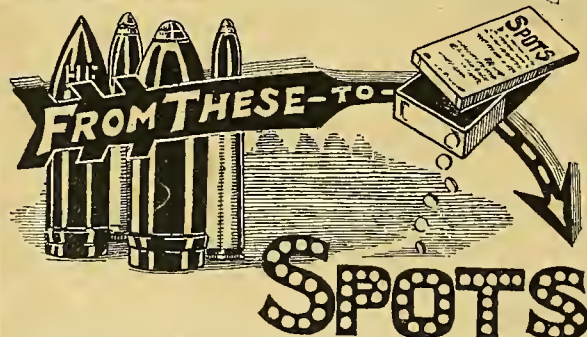
The design of the whole machine has been worked out—not guessed out—as will be seen when the A.B.C. Catalogue is issued.

A.B.C. MOTORS, Ltd., Walton-on-Thames.

Phone: Walton-on-Thames 220.

Grams: "Revs, Waltoo-on-Thames."

Enquiries for France, its Colonies, and Protectorates, should be addressed to the Société Française des Moteurs A.B.C., 28, Avenue de l'Opéra, Paris.



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Best materials and workmanship throughout, fitted with two-speed gear, footboards etc.

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OVERSEAS MODELS.

Sir,—All we Colonials are indebted to you for your efforts to bring home to English manufacturers the need of meeting Colonial demands. I expect to be home shortly on leave, and shall be on the look out for a combination that will meet local requirements. Failing satisfaction, I shall return here and invest in another Yank. But I hope this will not be necessary, for we all want British machines, if only the British manufacturers will give us the right sort of goods. Ceylon.

(REV.) A. M. WALMSLEY.

TANGENTS OF OBSERVATION.

Sir,—With reference to the discussion in your paper *re* tangents of observation, I have noted the remarks of Mr. Holland and "Curious," and I enclose the following formula, which I think fulfils their requirements on the distances at which objects can be seen, according to their respective elevations and the elevation of the eye of the observer, from sea level:

$$D = 1.42 \sqrt{H}.$$

It can be seen by this that an object 20ft. high is visible to an observer whose eye is 300ft. above water from a distance of 30.88 miles, arrived at thus:

	Distance visible.
20ft. elevation	6.34 miles
300ft. "	24.54 "
	30.88 miles

Which I think somewhat upsets the idea of seeing 200 miles from anywhere with the naked eye.

Egypt.

GUNNER HARLE.

GUDGEON PIN FIXING.

Sir,—I was much interested in "Ixion's" remarks on December 26th, 1918, *re* lubrication. He says: "If he keep the excess of oil out of the cylinder, the gudgeon pin bush may complain." Then again: "When the oil supply to the cylinder is reduced to rational proportions, our tiny gudgeon pin bushes will be overheated and overloaded, unless they are redesigned in the meantime."

Now, why in the name of everything wonderful, do not our engine designers take a leaf out of Mr. Ford's book, and construct their gudgeon pins on his well-known and tried principle? There we have our gudgeon pin made a fixture to the connecting rod, and a bronze bush pressed in the boss on both sides of the piston. Thus there is double bearing surface which gets ample lubrication from the cylinder walls. Another great feature in the above design is the elimination of any gudgeon pin fixing trouble.

I hope to hear other readers' opinions on this important, though much neglected, matter.

R. DE B. KENNARD.

THE IDEAL SIDECAR MACHINE.

Sir,—In the sketch published in *The Motor Cycle* for January 2nd, page 13, I note that the designer has placed the magneto in the correct position! Such a thing, I think, has never been done before. In all machines that I have examined, or ridden, the magneto is either placed in front of the engine, right over the exhaust box, where it gets dangerously hot and cannot be lubricated, or it is placed behind the engine, but wrong way round, so that the contact breaker is towards the sidecar, and so cannot be adjusted without detaching the sidecar.

The only proper position for a magneto is behind the engine on a platform insulated with thick fibre or asbestos board, so that heat cannot be conveyed from the engine, and the magneto must be driven from the left-hand side of the engine (as shown in the sketch referred to), so that the contact breaker is on the right-hand side of the machine, and can be got at without interfering with the sidecar. Why so many (I think all) manufacturers make the mistake of placing the magneto in either the first two positions referred to I cannot imagine.

I have at present a machine with the magneto in front of the engine. The bearings are packed with vaseline which is supposed to last for 4,000 or 5,000 miles or more, but after packing the bearings I have examined them after a few days and found that, owing to the high temperature conveyed from the exhaust box, every trace of vaseline had disappeared, and they were practically running dry! Every designer should know that vaseline (or other grease) becomes liquid

at a temperature of 200° or less, and so the magneto should be placed, as I suggested, behind the engine on an insulated plate.

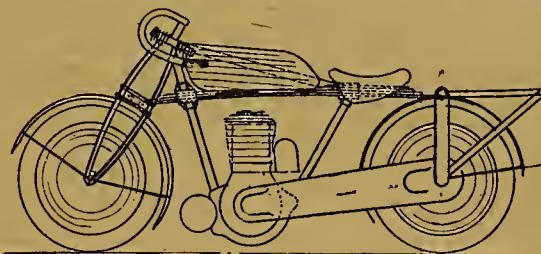
Also, the low position (when in front of the engine) is all right if a pit is available; otherwise it is not pleasant to have to "grovel in the dust" when attempting to adjust the contact breaker, and it is also rather a nuisance to have to dig a pit beside the machine if a breakdown occurs on the road! Owing to the method of "securing" the magneto sprocket generally adopted—a taper spindle only; no key or other positive fixing—these breakdowns are by no means infrequent, as I know from bitter experience in the past.

M. HITCHCOCK.

[Naturally the magneto will get hot if placed immediately above the exhaust box, but this is the first complaint we have received of such serious consequences, and this trouble does not necessarily exist in all motor cycles having the magneto in a forward position.—ED.]

SPRING FRAMES.

Sir,—I venture to suggest a design of spring frame, as shown in rough sketch herewith. This, I claim, possesses all the advantages of those which you have illustrated



A suggested design for a spring frame sent in by "H."

from time to time without their many drawbacks. The detail, while it may appear complicated, is not so when gone into. You will note the design embodies a leaf spring. East Dulwich, S.E.22. H.

POST-WAR MOTOR CYCLES?

Sir,—At last the veil has slightly lifted, and some manufacturers have the temerity to state boldly that they have actually a post-war motor cycle, or, if not, at least one designed, priced, and catalogued. Good. But, unfortunately, there are others. Let us be patient! We gave up our precious motor cycles in 1914, and after four years' abstinence our fingers itch to open the throttle again and travel the open road. But the time is not yet. Patience, only a few months more and your wish shall be fulfilled. Close your eyes to the attractive specifications and real prices which appear side by side our exhortations, and if you wait long enough you may find we are producing just the machine you want—or do not want!

Why, in the name of goodness, are some manufacturers so mystifying? They have a waiting list. Have they a policy, and, if so, why not disclose it? Surely, it would appear as if the dark hand of the Censor were at work. Is it that some firm is producing a wonderful engine, with which it intends to dazzle the world when we have all bought our choice? I was speaking to a manufacturer just before hostilities ceased and told him I was out to buy—would he favour me with some idea of his post-war motor cycle? "Ah!" he replied with a merry wag of his finger. "And the price, too?" I enquired. "Ah, ah!" he evaded again. I saw his advertisement last week inviting me to enter his waiting list parlour. Not I. If in two months there is only a waiting list, in how many months will there be a production of motor cycles?

The whole thing is preposterous. One knows the difficulties of changing over, but at least let there be plans made, catalogues printed, and prices fixed, especially by those firms who have been supplying motor cycles to the Government during the war. In the first place there was naturally some reluctance to specify prices; but, manufacturers, do not be afraid, show your hands; we know the worst, and have stiffened our backs. The last penny of my gratuity shall be yours, if you will only disclose the wonder you are producing in the dim, distant future.

APEX.

Ripon.

A CURIOUS CASE.

Sir,—As a long-standing reader of your excellent and always interesting paper, I venture to relate an experience of mine with an A.B.C. flat twin fitted with Dixie magneto. It has to do with the question of even firing and normal running with carbon high-tension brushes removed.

I (like one of your readers, "D.R.," from Mesopotamia, who writes in your number of November 21st) found that the machine, minus a brush, fixed evenly, but I did not even leave in the spring holder! I have tried several A.B.C.'s with both or one complete carbon brush removed, and could tell no difference either in starting or on the road. The gap from brass liner in vulcanite holder to the high-tension slip ring of magneto I measured just under $\frac{7}{16}$ in. to $\frac{1}{2}$ in.

How can one account for this, as there is nothing that one can think of which would induce the high-tension current into the holder and from there across the plug gap?

Mansûra, Egypt.

F. A. COWAN.

RACING TRACKS.

Sir,—I should like to endorse the suggestions put forward by Mr. W. Cooper in his open letter to the trade, published in the issue of January 2nd.

Before the war I was constantly advocating the construction of tracks in the North and Midlands, but at that time the idea did not seem to appeal to the majority of the manufacturers. One hopes that the generally broader outlook produced by the events of the last four years will result in the adoption by the industry of a less parsimonious policy in the matter of tracks, and of racing and competitions generally.

At the same time I cannot follow Mr. Cooper in his criticisms of Brooklands. Of course, the track is not quite ideal—in more than one respect—but it has nevertheless amply proved its value. Its renovation should be the first job of reconstruction, and it would be interesting to know what preparations, if any, are being made in this direction. Perhaps the B.A.R.C. will make a statement.

L. FRANCIS JONES, CAPT., R.A.F.

STRAIGHT TUBE FRAMES.

Sir,—*Re* Mr. Bradshaw's comments on the above subject, surely with regard to the lateral stresses a straight tube non-duplicate frame, triangulated for all stresses in a vertical plane, is on a par with a curved tube frame, in that it is flexible to those lateral stresses, so that it should not prove any weaker in that respect than a curved tube frame. The difference in the lengths of the tubes in the respective cases would be infinitesimal, so that the lateral rigidity would be approximately the same.

I cannot see, therefore, how lateral stresses can be used as an argument against using the principle in a vertical plane. As to my reference that proper triangulation has been demonstrated to be feasible in these pages, I regret that I cannot refer to the actual articles or diagrams, as, owing to having been on Active Service the last three years it has been impossible to keep back numbers.

However, I remember one diagram of perfect triangulation in a vertical plane, and also in any lateral plane, except for the forks housing the rear wheel, which could be braced girder fashion. All the tubes were straight and in duplicate, including those on top and below the tank, and there was an extra pair which braced the lower part of the frame, crossing each other, not parallel, dividing it into two triangles. It would, however, be rather difficult to house a tank sufficiently low in this frame.

So to embody the principle for quantity production a pressed steel tank forming the upper frame member (somewhat *à la* Premier two-stroke) would appear the best solution. Possibly this could be pressed in two halves. Each side could be arranged to be symmetrical, so that the same pattern would suit either side. And these halves could be welded together on the top and bottom edges, enabling the bottom of the tank to be pendulous, below the line of the bottom of the steering head. Duplicate tubes could depend from lugs on each side of the tank fore and aft, one pair from the head and two pairs from the saddle end to form two rigid triangles.

A small horizontal twin placed transversely would be housed conveniently at the fore apex, the rear apex being the centre of the countershaft. The rear end of the tank would possibly house integrally a cylinder containing a plunger and spring

for the spring frame, *à la* Flying Merkel. This latter arrangement has the advantage of absorbing part of the road shock by a horizontal component instead of all vertical. The centre pair of bracing struts from engine to saddle might be arranged to cross each other to give lateral rigidity.

However, no one can deny that Mr. Bradshaw's curved tube frame must promise a longer life than many straight tube frames on the market, ladies' models particularly.

R. M. WIGG.

WAR-TIME MOUNTS.

Sir,—It may be of general interest to your readers as well as profitable, if a correspondence is opened on mounts used during the war by the limited number of civilian riders with petrol permits.

Of course, every reader has marvelled at the superb reliability of military motor cycles (to say nothing of the equally superb dash and hardihood of their riders), as described in your pages from time to time. We Anno Dominis, C3's, and indispensables remove our hats and tender the hero riders our sincere gratitude, with an expression of admiration for the fine machines they have so capably handled.

During the four years of war I have had to cover many thousands of miles in a business-capacity, and, like every other civilian rider, have managed to "carry on" only under the greatest difficulties. Shortage of petrol and oil, difficulty of obtaining spares and of getting repairs done have given perplexity.

I have bought and ridden four machines during the four years.

First, I bought a two-stroke which did me well as a solo bicycle, but I wanted a machine to take a sidecar for the purpose of carrying goods.

I tried a $3\frac{1}{2}$ h.p. with hub gears. This made an excellent solo machine, its flexibility making a strong appeal after a "neck-or-nothing" two-stroke; but with the coach-built sidecar I attached to it I could never trust the gears. I always managed to change sweetly enough, but when tackling a stiff gradient with a full load I always got the impression, in changing down, that I was setting a David against a Goliath. So I sold it as a solo machine, and as a solo machine it is still doing well.

I next tried a $3\frac{1}{2}$ h.p. countershaft combination. The bicycle was heavy after the hub-gear machine. The chain-cum-belt transmission, however, gave a silky, reliable drive, the gears were delightful to handle, and one felt a robust confidence in tackling hills. As a double-purpose machine it was excellent, but in the end I found it too slow on hills and the engine liable to overheat in hot weather when the sidecar was loaded.

I next tried a 5-6 h.p. Rudge-Multi, which just filled the bill. The power it can be made to exert from its long cylinder is something to astonish those who do not know this type, and the way it climbs hills which cannot be rushed without knocking is good to experience. Its accessibility also makes one independent of the repair depot for all the ordinary purposes of cleaning out, changing tyres, grinding in valves, etc.—not that I do much tinkering; it never seems to require it.

I wore out two belts rather quickly, but I was buying experience. I now change down at the bottom of the hill to the gear I know will take me to the top, throttling down as I do so. My present belt has been running eighteen months, and looks good for another eighteen. It is a John Bull $1\frac{1}{2}$ in.

Starting up in winter was at one time no small operation, but I have acquired just the knack, and can always get away with three turns of the pedals.

EGDUR.

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The Control of Aeroplane Engines.

The Pilot's Work: Notes on Management.

By TORQUE.



An article on the same subject appeared on December 26th.

ON most engines lubrication is by pressure, recorded on a gauge in lb. per square inch. The correct pressure may be as low as 20 lb., or as high as 100 lb., according to design. In either case an excessive pressure is certain to be registered on first starting. The cold oil will build up heavy resistances in the small bore pipes, and the gauge will perhaps read 10 lb. or 20 lb. more than the standard pressure; nevertheless, in the more remote parts of the circuit (e.g., the far end of an overhead camshaft) the oil is not really circulating at all. So the engine is run at 350-600 r.p.m. until the gauge records the proper pressure. Too low pressure signifies a leak. Absence of pressure shows that the pump is out of action. Excessive pressure indicates resistance in the oilways, i.e., cold oil or dirt. When the pressure steadies at the correct figure, the engine may be gently accelerated.

The warming up of a big engine in winter may be a lengthy business, as the oil tank may contain many gallons of oil, all of which has to be warmed, as it requires to be circulated incessantly. When time is a consideration, the tank will be replenished with warm oil just before starting up. Even if this dodge is adopted, the oil in the more remote leads of the engine may not have begun to circulate when the engine has been running for several minutes. As the bearings are under load the whole time, it is best to switch off after three or four minutes' running, and wait a few minutes whilst the heat from the combustion chambers is conducted to cooler parts of the engine. The engine is then restarted, and run for another three minute spell, and so on, until all the oil in the engine and in the tank is hot. An alternative wrinkle consists of pouring a pint of hot oil into the cam case—usually the last detail to warm up: a plug is sometimes provided for this purpose, or the lid over one of the cam case compartments can be removed. The same dodge is employed with new engines taken out of store, and with engines which have been standing idle for several weeks.

The Tachometer.

The revolution counter now becomes the centre of interest. An aero engine is handled under very strict regulations with regard to r.p.m. Three separate limits may possibly be specified for a given engine. For example, at ground level 1,500 r.p.m. must not be exceeded. Above 10,000 feet the "normal" r.p.m. may be 1,600 r.p.m. and the "maximum" 1,700 r.p.m. These figures require some explanation. Some

engines are designed with such high compression ratios that it would not be safe to run them all out with a full charge of gas at ground level. At altitude the charge is weakened, and the engine may be speeded up. "Normal" represents the speed at which the engine may be run continuously; "maximum" is the absolute limit, and may only be maintained for a very few minutes; the load on the bearings may be *doubled* by accelerating from 1,600 r.p.m. to 1,700 r.p.m., and the bearings can only stand the maximum load during a brief spurt.

As soon as acceleration becomes safe, the pilot ascertains that the engine has been properly tuned and will give the maximum r.p.m. permissible on the ground, with the throttle in the appropriate position: in the engine described above, this will not be fully open. The aeroplane is meantime secured by chocks before the wheels and by men at the tail. We next proceed to test the ignition and carburation. The former implies running the engine up and down its range on each ignition separately: the latter demands rather more violent acceleration and deceleration, such as might be needed in a fight. A glance at the exhaust will indicate whether the mixture is approximately correct, and also whether the supply of oil is accurate: the exhaust should smoke a little at the first acceleration, and clear almost immediately.

The altitude control should be tested before taking off, but this duty should be reserved for specially competent persons, as it is a task of great delicacy and some danger. Opening the control weakens the mixture. A weak mixture burns slowly. If the mixture is unduly weakened at ground level, it will certainly burn and warp the valves, and may even flame down the inlet valve and cause a conflagration.

The "percentage" of control is known to the tester. He will accelerate the engine to its full "ground level revs.," and suddenly open the control. If all is in order, an instant drop of perhaps 250 r.p.m. should be registered on the tachometer. He just gives the needle time to steady, notes the reading, and slams the control shut again, before the valves can be damaged or a fire be caused.

Getting Off.

When absolutely satisfied that the engine is running perfectly in every respect, the pilot prepares to get away. The engine will be opened out gradually during the run up. After getting off, the tachometer may be referred to if the pilot is not completely at home with that particular type of machine. In taking off, the

The Control of Aeroplane Engines.—

chief possibility of a mistake lies in climbing too steeply. The pilot will know what air speed should be maintained, and this air speed is, of course, connected to some extent with r.p.m.

Gaining Height.

Unless a defect should develop in the engine, the pilot is now chiefly concerned with keeping his engine cool and economising fuel. If the machine is climbed too hard the water may boil, in which case a short dive or a horizontal cruise will be necessary to cool the radiator; nobody can afford to lose water at the commencement of a flight. Fuel economy is attained by careful attention to the altitude correction of the carburetter. This is not sufficiently sensitive to affect the power perceptibly at low altitudes, but it can nevertheless vary the fuel consumption, which is important, especially on four-engined machines which devour perhaps eighty gallons per hour. Consequently the pilot should set the altitude corrector with the aid of the tachometer as he climbs. With such a machine as the five-engined Gotha, carelessness with the mixture to the extent of a 10% error on the rich side in a six-hour flight would mean wasting sixty gallons of petrol. The "tankage" would have to be excessive to allow for such clumsy pilotage, and would reduce the bomb load by three or four cwt. Alternatively, if the tankage were kept down to the theoretic minimum, a bad pilot would not return from a long flight. On a Transatlantic flight the vital effects of perfect mixture are even more important. On rotary engines the mixture is controlled by a "fine adjustment" needle valve, the carburetter having no float feed. With one of these engines a careless pilot may register a consumption 25% greater than the normal. As rotary engines were chiefly used on fighting scouts with a three-hour "tankage," the bad pilot reduced every flight by a period of forty-five minutes.

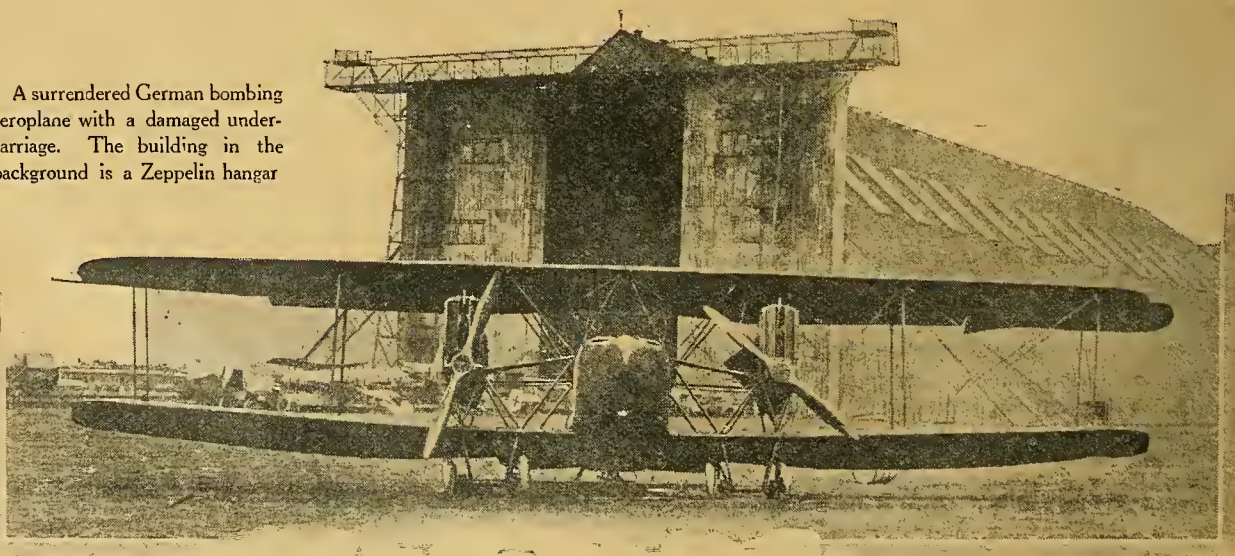
Coming Down.

Horizontal flight presents no special problems in engine management, except so far as the use of the radiator screening device is concerned, and the neces-

sary setting of the altitude correction. Coming down is, however, quite a tricky business under certain conditions. In descents from a great altitude an accidental engine stoppage ("losing the prop."), due to choking on minimum throttle, is of small account, as the propeller is turned by friction with the air, and will restart a responsive engine in a dive of a few hundred feet. On the other hand, the engine is not necessarily responsive, when once the prop. is lost. The sparking plugs may oil up. The petrol level in the carburetter is greatly affected in a steep dive; and, unless the "flooded" petrol is evacuated by suitable drains, the excessively rich mixture may obstruct a re-start. Again, the radiator may freeze in a prolonged dive, or the oil may congeal very thoroughly. Some machines can safely be dived at 200 m.p.h., and in winter such a speed rapidly chills an engine. In all these respects both the engine and the aeroplane require knowing. Two engines of the same make may be equipped with different makes of carburetter, which require alternative handling in a descent. The temperature of the atmosphere varies daily. Different types of aeroplane furnish varying degrees of protection for their engines, so that a given make of engine may ask for one type of humouring in a Martinsyde, and another sort of coaxing in a D.H. On some machines the throttle "picks up" the altitude control, which is consequently shut in every "engine off" dive. On another machine the pilot must remember to shut the altitude control, or when he flattens out after a long dive the mixture will remain as set at a higher altitude, and the engine may choke. Generally speaking, the pilot will throttle down his engine during a long glide and watch his instruments carefully.

The pilot's main duty after landing is to report any imperfections in the engine to the foreman mechanic. Where a rotary engine is concerned, the stoppage should be made by cutting off the petrol supply, so that no gas may remain in the crank case and cause an accidental start when the mechanics get busy. Revolution tests can be made before switching off, and will form a useful guide as to whether any serious adjustments are needed.

A surrendered German bombing aeroplane with a damaged undercarriage. The building in the background is a Zeppelin hangar





Gear Ratios on a Solo Machine.

Why not Solo Gears for Solo Machines? A Plea for Suitable Ratios.

BEFORE expounding my views I wish to point out that by the term "gear ratios on solo machines" I do not entirely allude to top gear ratios: the motor cyclist—we all know him—who rides a $3\frac{1}{2}$ h.p. single on a 4 to 1 top gear and then grumbles (1) because his engine knocks, (2) because he cannot get any speed, (3) because his petrol consumption is high, can turn this page.

The manufacturer professes to give us a machine suitable for solo work and then plays his favourite joke of giving us gear ratios of something like this: $5\frac{1}{4}$, $8\frac{1}{2}$, 15.

For a $3\frac{1}{2}$ h.p. these ratios are preposterous; the top gear is absurdly low, and the drops between gears are absurdly large. Of course, it is quite obvious why makers give us ratios like this. It is because the gear box ratios are designed so as to be suitable for sidecar machines (and apparently for all horse-powers from $2\frac{3}{4}$ h.p. to 8 h.p.). But why should this be so? Surely there is a large enough market for solo machines to enable just one maker to give us a gear box with suitable ratios.

A point in connection with gear box ratios is that a large amount of the bad driving—bad driving, not bad riding—is due to the gear box ratios. In that the rider hangs on to top gear when he should always change down because he knows that his machine will be appallingly slow (and appallingly noisy) if he changes to second. So that the bad driving and the ill-treatment of the machine are due to the supineness of the maker!

As a concrete instance, I know of a $3\frac{1}{2}$ h.p. twin, which is advertised and sold as a solo machine, which is absolutely ruined by its gear box ratios. It is a topping little 'bus in every other respect, but it possesses this fault which makes riding it a toil instead of a pleasure.

It has gear ratios (I am speaking from memory, but the figures are approximately correct) of $5\frac{1}{2}$, $8\frac{1}{2}$, and 16. Sixteen!!

What are Suitable Ratios?

The machine will climb anything and start on quite a stiff gradient on second gear, so that this low gear is never used, which means that the machine has only two useful gears. So for what reason should the purchaser have to pay for and carry about with him this additional pair of gears? (Of course, all this does not appeal to the extraordinary individual whose ambition it is to climb Mont Blanc on a motor cycle; for such a person the sidecar ratios, as fitted at present, are quite suitable.)

To return to our $3\frac{1}{2}$ h.p. twin, or $3\frac{1}{2}$ h.p. or 4 h.p. single, for the matter of that, if it were fitted with three speeds, say, $4\frac{3}{4}$, 6, and the present $8\frac{1}{2}$, it would be, to my mind, ideal. One could then change down early on a hill, keep up the revs. (and the speed), and save the engine, gears, and tyres the unnecessary stress.

There is a gear box, a very excellent gear box, which is fitted to the best of our war mounts, and will be fitted to many of our post-war machines, but it is emphatically not the gear box for a solo machine. It gives ratios (memory again) of approximately $5\frac{1}{2}$, $8\frac{3}{4}$, and 15. This was all very well up the line in France; in fact, I will admit quite frankly that very often the low gear was far too high for me—yes, I was a D.R.—but in England, on English roads, oh! no. Who will ever want a 15 to 1 gear on a 4 h.p. solo machine in England?

The Useless Bottom Gear.

On this war machine, for starting one never needed anything lower than second (unless it was on greasy *pavé*, and the result was usually the same whatever one used). And for hills? Well, I have used second, but not often. Yes, my fellow D.R.'s, I know all about that time you climbed Kemmel Hill, but I am talking of riding on *roads*, not on dirt tracks or boulders.

This particular machine, the 4 h.p. Tr—— (my word, I nearly let it!), was very nice to ride in the back areas on a $4\frac{1}{4}$ to 1 top, but of course one had to change down a good deal in hilly country, which meant dropping to about 7 to 1—many revs and very little speed! If it had had a second gear of, say, $5\frac{3}{4}$, with a low gear of, say, 9, it would have been delightful.

To go into the question a little more technically: to climb a gradient of 1 in 5—about as steep a hill as is ever met with in ordinary road work—with a bad surface requires a tractive force of 550 lb. per ton. If we assume a mean effective pressure of 75 lb. per square inch and a transmission efficiency of 80%, we find that the gear needed for a 500 c.c. motor cycle, weighing with rider 450 lb., is 9.3, which agrees fairly well with my proposed low gear of $8\frac{1}{2}$.

Revenons à nos-boîtes de vitesses! I have not yet tried or examined a four-speed gear box, but apparently it is such as I am asking for, with the loathsome 15 to 1 added to the three useful gears.

So, in conclusion, may I beg Messrs. Gear-boxes, Ltd., to give us poor solo riders a solo gear box for a solo machine?

ARCHIE.

▲:

QUESTIONS AND REPLIES

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C.4, and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

Altering a Magneto.

Please let me know if it is possible to convert a clockwise magneto into an anti-clockwise one by fitting a different contact breaker.—P.W.

Yes; by fitting a contact breaker operating in the reverse direction.

Magneto Lighting Sets.

I thought I would make an attempt at magneto lamp lighting, and have an idea as to how it should be done with the following exceptions: (1.)

Could you tell me the approximate voltage generated in the primary circuit when the engine is running at normal speed? (2.) If this current is choked down to suit a five-volt head light, would it be necessary to place a resistance in circuit of tail lamp if only a three-volt lamp is used? (3.) Is it possible to regulate the choking coil in accordance with speed of the engine automatically, and where could I get one for this purpose?—A.J.P.

(1.) The voltage in the primary depends on many factors, and varies in different magnetos and increases so greatly with the rise in speed that it is difficult to give any reliable figure, but ten or twelve volts may be taken as approximate for the class of magneto concerned. (2.) The best way would be to use a five-volt lamp in the rear light as well as in the front; if a resistance is inserted it will only waste current, which might just as well be used in giving light. (3.) Such an arrangement would be very complicated and costly. If you intend going to such an expense and trouble, it would be more satisfactory to get a proper dynamo lighting set. Before embarking on this scheme we would remind you that the energy available in this way from a magneto primary circuit is quite a small amount, and that a good proportion of this must be lost in the transformer, leaving very little for the lamps; also that it is bound to weaken the ignition, especially at low speeds. The accumulator in any case must be charged from a separate source, and by obtaining a larger one and using this to supply the lamps without interfering with the magneto, all the advantages of electric lighting may be had at less expense. What you call a "choking-coil" should really be a transformer. A choking coil for an alternating current is placed in series and consists of a single coil, whereas a transformer is placed across the circuit and consists of two independent coils.

Running Costs.

I use a 2½ h.p. Douglas three-speed 1915 motor cycle (which is my own property) on certain work, the petrol and oil being found me, but I attend to all repairs and cleaning. Would you please advise me what would be a reasonable price to charge per mile for the use of the machine, the amount to cover fair wear and tear and depreciation?—C.J.

You should charge a pair of tyres, say, every 5,000 miles, and add depreciation as 20% for the first year when new and 10% each subsequent year, i.e., 10% of the successively reduced values. A farthing per mile would not be unreasonable.

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Gear Box Lubrication.

I have a 4½ h.p. Singer counter-shaft gear machine, which I ride solo. (1.) When running the gears have a very pronounced whistle. Is there any cure for this, and is it advisable to run with grease in the gear box, as there is a hole from it into the crank case? (2.) What size of jet should I use running solo (B. and B.)? (3.) What mileage should I get per gallon? (4.) What kind or make of lubricant would you advise?—H.J.F.

(1.) The trouble may be shortage of oil. It may make some difference if you use oil and grease mixed in the gear box. (2.) We should recommend a .032 jet. (3.) Between seventy and eighty miles to the gallon. (4.) For the engine, any good make of oil for air-cooled engines, such as Prices' Huile de Luxe, Vacuum, Castrol, etc. For the gear box, most motor cycle gear boxes are filled with engine oil, but if the gears are found to be noisy use gear oil; Vacuum C, for example, is a good lubricant. It is best warmed before being inserted, but it cannot be used in the crank case of an engine.

Gears for Sidecar Work.

(1.) I have a 4 h.p. Bradbury, which refuses to pull a sidecar on the top gear of approximately 4½ to 1. Is this gear too high? (2.) I am using an inch belt,

which does not settle down properly in the groove of the engine pulley. The latter is evidently designed to accommodate a 7/8 in. belt, which I find would appreciably reduce the gear. Do you think a 7/8 in. belt strong enough to pull twenty-one stone, including luggage?—G.E.C.

(1.) The gear for a single-cylinder machine should not be higher than 5 to 1, preferably a little lower, say 5½ to 1. (2.) The belt, of course, should not go right into the pulley, but project, say, 1/8 in. 7/8 in. is certainly small. The pulley and rim should be made to accommodate either a 1 in. or 1½ in. belt.

READER'S REPLY.

Cones Working Loose.

I have known this happen to our battery Clynos through the wheel being put in the wrong way round. The back wheel, of course, allows of no mistake.—SOUTHCOMB MAY.

RECOMMENDED ROUTES.

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ALLDAYS, 4 h.p., 3-speed, 4-stroke

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7. You will probably have decided by now that you will not stand much chance of getting a machine unless you order in advance. All that you now want to decide is with whom to place your order. We do not want to say that we are the largest London contractors for new machines. This, as yet, we do not know. We can only state that we have on order a VERY LARGE NUMBER of every make, and that we shall not state a delivery date unless we are reasonably assured that the makers can deliver.

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3. THREE MONTHS' FULL GUARANTEE.—The same guarantee that the makers give with a new machine.

Our stock of Second-hand Machines is still unequalled in London, and fresh stock is arriving daily.

SELECTION FROM SECOND-HAND STOCK:

ALLON 1918 5-6 h.p. twin 2-stroke Combination, Lucas dynamo lighting, sporting Sidecar, spare wheel, as new 115 gns.
 ARIEL 1914 3½ h.p. 3-speed Combination .. 45 gns.
 A.J.S., 1916, 2½ h.p., 3-speed, clutch, k-start. 55 gns.
 AMERICAN EXCELSIOR 7-9 h.p. 3-speed Combination, dynamo lighting; run under 1,000 miles, late 1916 model 98 gns.
 B.S.A. 1913 3½ h.p. 2-speed Combination .. 38 gns.

CALTHORPE-J.A.P., 1916 2-speed, clutch ..	32 gns.
CALTHORPE, 1916, 2-speed, 2-stroke	29 gns.
CONNAUGHT, 1916, 2-speed, 2-stroke	27 gns.
DOUGLAS 1916 4 h.p. 3-speed Combination ..	89 gns.
DOUGLAS, 1914, 2-speed, perfect	39 gns.
ENFIELD, 1916, 3 h.p., 2-speed, clutch, kick-starter	42 gns.
F.N., 1914, 5-6 h.p., 4-cylinder, clutch, kick-starter, sporting Sidecar	68 gns.
HARLEY-DAVIDSON 1916 7-9 h.p. Combination, magneto model	89 gns.
HENDERSON 1915 10 h.p. Combination, hood, sc'n	89 gns.
HENDERSON, 1915, 10 h.p., fine coach Sidecar, as new	95 gns.
HUMBER 1918 6-8 h.p. water-cooled Combination	85 gns.
HUMBER, 1918, 3½ h.p., twin, 3-speed, clutch, handle start	69 gns.
HAZLEWOOD 1916 6 h.p. 3-speed Combination, as new	85 gns.
HUMBER, 1913, 3½ h.p., 2-speed	27 gns.
HUMBER, 1914, 2 h.p., good order	17 gns.
INDIAN, 1914, 7-9 h.p., 2-speed	39 gns.
INDIAN, 1916, 7-9 h.p., 3-speed, sporting Sidecar	85 gns.
INDIAN, 1915, 5-6 h.p., 3-speed, sporting Sidecar	75 gns.
IVY, 1916, single-speed, 2-stroke	23 gns.

JAMES, 1914, 4½ h.p., single-speed, renovated	32 gns.
LEVIS, 1916, Popular, single-speed	23 gns.
L.M.C., 1915, 4 h.p., 3-speed	47 gns.
MATCHLESS, 1914, 6-8 h.p., 6-speed	39 gns.
MOTOSACOCHE, 3½ h.p., twin, 2-speed, cl.	45 gns.
MORGAN, 1915, 8-10 h.p. o.h.v. J.A.P., perfect, fitted copper dash, electric lighting, and many extras	145 gns.
NEW HUDSON, 1914, 3½ h.p., 3-speed	35 gns.
N.S.U., 1913, 3 h.p., 2-speed, clutch	23 gns.
N.S.U., 1914, 2 h.p., 2-speed, clutch	26 gns.
NORTON, 1914, 3½ h.p., T.T.	35 gns.
PREMIER, 1916, 3½ h.p., 3-speed	59 gns.
PREMIER, 1915, 3½ h.p., 3-speed	45 gns.
PREMIER, 1914, 3½ h.p., 3-speed	38 gns.
PREMIER, 1913, 2½ h.p., clutch	23 gns.
P. & M. 1915 3½ h.p. 2-speed Combination ..	65 gns.
RUDGE-MULTI, 1915, 3½ h.p.	48 gns.
RUDGE, 1913, 3½ h.p., T.T., single-speed ..	27 gns.
REX-T.T., 6 h.p., T.T., sloping tank	35 gns.
REX late 1914 6-8 h.p. coach Combination ..	69 gns.
HARLEY-DAVIDSON, 1917, 7-9 h.p., 3-sp., electric model, perfect order	135 gns.
SUN-VILLIERS, 2½ h.p., 2-speed	32 gns.
SUN-VILLIERS, 2½ h.p., single-speed	25 gns.
ZENITH-GRADUA, 1916, 6 h.p., counter-shaft	69 gns.
SWIFT Cycle Car, 7-9 h.p., 1915	145 gns.

Any Machine sent on "The Motor Cycle" Deposit System.

RIDER TROWARD & CO.,

31, 40b, & 78, High St., HAMPSTEAD,
N.W.3.

MISCELLANEOUS ADVERTISEMENTS.

PRICES.

ADVERTISEMENTS in these columns—First 12 words or less 1/6, and 3d. for every two words after. Each paragraph is charged separately. Name and address must be counted. Series discounts, conditions, and special terms to regular trade advertisers will be quoted on application.

Postal Orders sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd., and crossed**

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.4.), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge. Only the number will appear in the advertisement. All replies should be addressed "No. 000, c/o 'The Motor Cycle,' 20, Tudor Street, E.C.4."

DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pays carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged; when under the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may have equally desirous, but have not advised us to that effect.

SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

MOTOR CYCLES FOR SALE.

A.B.C.

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery of the new A.B.C. [2254]

A.J.S.

1917 A.J.S., 6h.p., lamps and horn; £85.—Below

1916 A.J.S., 6h.p.; £80.—Below.

1915 A.J.S., 4h.p., semi-T.T. bars; £68.—Elce and St. Co., 15-16, Bishopsgate Av., Camomile St. E.C.3. [0551]

CROW Bros., Guildford—A.J.S. Agents since 1912. Write us for your requirements. [9777]

A.J.S., 1914, 2½h.p., 2 speeds, hand clutch, tyres as new, all in nice condition; £34.—Harry Lunn, Oak Terrace, Hainfrax. [X2065]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery of the new A.J.S. [2255]

A.J.S.—Immediate delivery latest 6h.p. combination; modern machines taken in exchange.—Parker's, Bradshawgate, Bolton. [X2113]

1914 6h.p. A.J.S. Combination, electric lighting, hood, new, speedometer, condition as new, guarantee given; lowest 70 gns.—21, Monney Rd., N.19. [2538]



1919 MODELS.

P. & M.
B. S. A.
JAMES
ROVER
LEVIS
ZENITH
NORTON
HUMBER
TRIUMPH
HENDERSON
MATCHLESS
CONNAUGHT
NEW IMPERIAL
ROYAL ENFIELD

We are now booking orders for execution in strict rotation. We quote highest prices for allowances on your present mount, and easy payment terms if desired.

SECOND-HANDS.

RUNABOUTS AND CARS.

MATHIS, 1914, 9 h.p., 3-seater, clover leaf £225
MORGAN, 1916, 6 lux, J.A.P. water-cooled £165
PHOENIX, 1913, 11.9 h.p., 3-seater, and dickey £150
STELLIE, 1914, dickey seat, being overhauled £230
ENFIELD, 1915, dynamo lighting, 5 wheels £265
CALCOTT, 1916, dynamo set, 5 wheels £325
FORD, 1914, 4-seater, standard £235

SIDECAR COMBINATIONS.

MATCHLESS, 1915, 8 h.p., M.A.G., dynamo £115
NORTON, 1916, 4 h.p., Norton Sidecar £90
P. & M., 1914, 3½ h.p., wicker Sidecar, as new £100
A.J.S. 1915 6 h.p. Combination £100
A.J.S., 1915, 6 h.p., and Sidecar, spare wheel £80
HARLEY-DAVIDSON, 1915, 7-9 h.p. Comb. £80
ROVER 1918 3½ h.p. Comb., almost new £100
MATCHLESS, 1916, 8 h.p., M.A.G., as new £105
ROVER, 1917, 3½ h.p., 3-speed, like new £90
ROVER, 1918, 3½ h.p., similar to above £100
SUNBEAM, 1916, 8 h.p., M.A.G., detachable wheels £130
HENDERSON, 1915, 10 h.p., 2 speeds £100

SOLO MACHINES.

ENFIELD, 1912, 2½ h.p., 2-sp., chain-drive £20
DOUGLAS, 1914, 2½ h.p., 2-sp., nice order £36
RUDGE, 1913, 3½ h.p., fixed gear, very fast £20
REGAL, 1914, 2 speeds, all accessories £36
P. & M., 1914, 3½ h.p., 2 speeds, kick-starter £48
TRIUMPH, 1914, 2½ h.p., Junior, 2 speeds £40
TRIUMPH, 1912, requires repairs £25
RUDGE, 3½ h.p., T.T., like new, small mileage £33
ENFIELD, 1917, 3 h.p., twin, 2 speeds, speedometer £20

Some of the above have not yet been overhauled, and, if desired, we could quote reduced prices to clients who could do the work themselves.



100, Gt. Portland St. LONDON, W.1.

Telephone: Mayfair 552
Telegrams: "Abdicat, Wesdo, London."

MOTOR CYCLES FOR SALE.

A.J.S.

A.J.S., 1914, 2½h.p., 2-speed, clutch, mechanically and appearance new; £40.—G. Baets, 10, King's Rd., Richmond, Surrey. [2445]

A.J.S.—For the earliest possible deliveries of 1919 models, advance specifications and super service, try the A.J.S. Specialists, The Walsall Garage, Wolverhampton St., Walsall. 'Phone: 444. [X0125]

A.J.S., August, 1916, 6h.p. combination, spare wheel, 2 horns, Miller lumps, set of spare clutch plates, valve, front and back chains, condition almost as new, perfect running order, not done 5,000 miles; £100; owner bought car.—Box 2,649, c/o The Motor Cycle. [X1882]

A.J.S. Spares; prompt delivery.—Cyril Williams, Chapel Ash Depot, Wolverhampton. [9189]

Alder.

1916 Alder, 2½h.p., 2-stroke, in new condition, not done 100 miles, Bosch mag., all accessories, Dunlop tyres; bargain, £25.—Thorpe, 54, Heygate St., Walworth Rd., S.E. [2380]

Alldays.

1916 Allon, 2½h.p., 2-stroke, 2-speed, as new; 37 gns.—W. Hemmings, 26, Arrow Rd., Bow, E.3. [2323]

ALLDAYS Allon.—Immediate delivery from stock, all models; exchanges.—Parker's, Bradshawgate, Bolton. [X2120]

1916 Alldays, 2½h.p., 2-stroke, lamps, horn, new condition; bargain, £25.—152, Camberwell Grove, Camberwell. [2439]

ALLON, late 1915, 2½h.p., 2-stroke, 2-speed, h.c. clutch, lamps, etc., splendid condition; £35.—G.5, Ingleby Rd., Ilford, Essex. [X2036]

ALLDAYS Allon, 1918, 2-speed, 2-stroke, run 300 miles only, oversize tyres; seen Liverpool; £41.—Box 2,675, c/o The Motor Cycle. (D) [X2142]

ALLDAYS Matchless, 1914-15, 2½h.p., 2-stroke, single speed, in first-class condition; £18, or new offer.—Mercer, opposite Adult School, Bordon Camp, Hants. (D) [2499]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery 2-speed and clutch Allons, £58; also De Luxe models, with kick start, £65. [2258]

ALLDAYS 8h.p. 3-speed Combination, June, 1914, unused since 1916, mileage 4,000, completely equipped, only wants seeing; £80.—Myfarn and Co., 197, London Rd., Croydon. 'Phone: 2379. [2488]

Ariel.

1912 Ariel, 4b.p., 3-speed, make fine sidecar machine; £18, or offer.—64a, Highbury Grove, Highbury, N. [2316]

3½ h.p. Ariel Combination, 1914, good condition; £45, or offer.—A. Brisseuden, 75, Thurlow Park Rd., Dulwich, S.E.21. [2509]

3½ h.p. Ariel 1913 Combination, 3-speed countershaft, chain drive, C.B. sidecar, all accessories, good condition; £38.—Poole, Woodberry Grove, North Finchley. [X2090]

RIDER TROWARD and Co., 31, High St., Hampstead.—New 3½h.p. 3-speed Ariel in stock, £80. Orders being booked for earliest delivery 5-h.p. combination. [2257]

ARIEL 1916 3½h.p. Combination, original tyres, 70 gns.; heap accessories; exchanges arranged.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [2085]

Auto-Wheels.

FOR Sale, Wall Auto-Wheel, new, and in perfect condition, not done 5 miles; owner left; a bargain, £12.—Foley, Square, Kenmare, Ireland. (D) [2443]

Bat.

1914 4-h.p. Bat-Jap, 2 speeds, free engine, lamps, speedometer, complete with Flying Middleton sidecar.—Apply, Davis, Garage, High St., Ringwood, Hants. [2286]

BAT, 1913, 5-h.p., spring frame, and Mills-Fulford radial spring wheel sidecar, the whole in excellent condition, with lamps; price £60; seen by appointment.—P., 72, Northampton Rd., Croydon. [2444]

BAT-J.A.P., purchased 1914, just overhauled, new tyres, spare valves and chains, torpedo wicker sidecar, with wind screen; £50, or exchange new 6h.p. combination with cash adjustment.—Jones, Broadway, Newbury, Berks. [X2183]

8h.p. Bat, 1914, chain drive, 2-speed, F.E., hand clutch, kick starter, torpedo tank, X.L. saddle, B. and B. carburettor, Bosch mag., Dunlop tyres, Mills-Fulford C.B. sidecar in good order, with spares; £45, or exchange Knifield combination.—Smith, Plumber, Wivenhoe, Essex. [2309]

Blackburne.

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery of new Blackburnes; 2½h.p., 2-speed, clutch, £60; 4h.p., 3-speed, £80; 8h.p. combination, £125, or with spare wheel £130. [2266]

MOTOR CYCLES FOR SALE.

Bradbury.

BRADBURY and Sidecar, 4h.p., 2 speeds, free, Binks, good condition, very reliable; £35.—Further particulars, Hoare, Anna Valley, Audover, Hants. [2485]

4 h.p. Bradbury Combination, splendid condition; £25, or exchange with cash for 6h.p. Enfield combination.—Matthews, 86, High St., Merton, Surrey. [2500]

BRADBURY Coach Combination, perfect condition, 3-speed, countershaft, and kick starter, perfect condition; price £55.—Chandler, Reyre, and Williams, Hitchin, Herts. [2558]

BRADBURY, 1913, 4h.p., N.S.U. gear, kick starter, new belt and John Bull back tyre, and cane sidecar, good running condition; £26.—Holland, Hoy Company, Whitstable. [X1883]

BRADBURY, 1913, with wicker sidecar, 2-speed, free engine, kick start, Bosch mag., B. and B. carburettor, perfect running order; £25.—Stevens, Newsagent, Sunninghill, Berks. [X2151]

B.S.A.

B.S.A., 3-speed, 1919 models in stock.—Reys, 378, Euston Rd. [1308]

1919 **B.S.A.**—Early deliveries at Briggs, Motor Agent, Wellingborough. [X0120]

1917 **B.S.A.** and Millford sidecar, complete, lamps, etc.; £76.—Cross, Agent, Retherham. [X2141]

NEW B.S.A.'s in stock; immediate delivery Model K.—Alexander, Agent, Wallasey Village. [1506]

B.S.A., 3½h.p., T.T. model, clutch, 1913; £30, or close offer.—132, Evering Rd., N.16. [2303]

B.S.A., 1917, chain-cum-belt drive, clutch, 3-speed gear box, 35 new, complete; £65.—12, Micheldover Rd., Lee Green, S.E. [2319]

B.S.A., 3½h.p., 1913, kick-start, 2-speed and clutch, excellent condition, and sidecar; £30.—47, Streatham Hill, S.W. [2526]

1919 **B.S.A.** Models, 78 gns. and 76 gns.; sidecar 28 gns.; immediate delivery.—Wallace Batchelor, Clarence St., Kingston. Tel.: 1809. [1463]

B.S.A. 1916 Combination, splendid condition, and well equipped; 65 gns.—Longman Bros., 2, King's Parade, Acton. 'Phone: 1578 Chiswick. [2550]

1916 **B.S.A.** Combination, splendid condition, lamps, horn, speedometer; bargain, 55 gns.—Rogers, Newington Terrace, Craven Arms, Shropshire. [X1889]

B.S.A. Combination, 1916, chain-cum-belt, 3-speed, very little used, lamps, etc., really good condition; Bourne-mouth; £70.—Box 2,674, c/o The Motor Cycle. (D) [X2143]

WE can give immediate delivery from stock of the new **B.S.A.** chain-cum-belt; price £79/16.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C.3. [0552]

B.S.A.—For the earliest possible delivery of 1919 models, advance specifications and prices, sole district agents, The Walsall Garage, Wolverhampton St., Walsall. 'Phone: 444. [X0126]

RIDER TROWARD and Co., 31, High St., Hampstead.—New 4½h.p. **B.S.A.** chain-cum-belt, in stock, £79/16. Orders being booked for earliest delivery chain drive model, £81/18. [2259]

B.S.A. 1916 Combination, speedometer, lamps, horn, hood, screen; seen after 2 o'clock Thursday, or by appointment; 60 gns., or exchange for P. and M.—Thompson, 25, Daville Rd., Shepherd's Bush. [2507]

B.S.A., all-chain model 78 gns., and belt-cum-chain model 76 gns.; also best **B.S.A.** sidecar, 28 gns., actually in stock; exchanges arranged.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [2081]

Calcott

CALCOTT, 2½h.p., single speed, adjustable pulley, a handsome mount; £20, or part exchange for powerful combination.—Apply, Keeping, 45, Ivor Rd., Hamworthy, Dorset. [X1669]

Calthorpe.

CALTHORPE Motor Cycles.—All models in stock for immediate delivery; no permits required.—P. J. Evans, 91, John Bright St., Birmingham. [0955]

2½h.p. Calthorpe-Jap, 1918 model, single speed, excellent condition, run under 500 miles, lamps, horns, etc.; £30.—Box 2,611, c/o The Motor Cycle. [X1539]

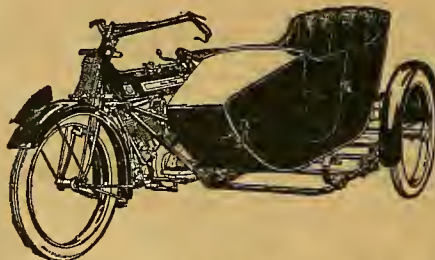
CALTHORPE Junior, 2½h.p., nice machine, dog gears, free engine, outside flywheel, good tyres, tubes, footboards, enamelled green, price £22/10, or will give £25 and above for 1915 **B.S.A.** Matchless combination, or Enfield 6h.p.—Barnard, Fish Docks, Milford Haven. [2290]

Chater-Lea.

3½h.p. Chater-Lea, in running order; a bargain.—32 Write Smith, 7, Coopers Cottages, Watford Rd., Harrow Rd., Sudbury. [X2023]

CHATER-LEA No. 7 Late 1915 8h.p. Combination, 3-speed gear box, clutch, kick starter, 3in. car tyres, fully equipped, Lucas lamps, horn, coachbuilt sidecar, luggage grid, wind screen, lovely condition; £68/10.—25, Warham St., Kennington Park. [X2098]

CHATER-LEA, sound condition, 6h.p. J.A.P. engine, Druid forks, Bosch mag., Armstrong 3-speed, wheels 26x2½in., spare back wheel, Millford wicker sidecar; offers, £35.—Rankin, Berkhamsted. [X1998]



The 6 h.p. ROYAL ENFIELD Combination.

Seek My advice—

Now that you can buy your motor cycle—restrictions free—is the time to have my assistance in choice.

I am happily in a favourable position to supply any of the undernoted well-known makes, and, in regard to particular needs, my experience enables me to guarantee your being fully suited.

In Motor Cycles:

A.J.S. ENFIELD, ROVER, NORTON, INDIAN, NEW IMPERIAL, ZENITH, TRIUMPH, JAMES HUMBER, CALTHORPE, &c.

Or in Light Cars:

PERRY, G.W.K., CALTHORPE, STANDARD.

I invite your inspection and examination of the latest models I now have on view, and am ready to furnish all information regarding latest developments in design.

Enquiries Solicited. Satisfaction Guaranteed.

P. J. EVANS

"The BIRMINGHAM House for Motor Cycles & Light Cars,"

87-91,

John Bright St., BIRMINGHAM

'Phone: Mid. 662. Wire: "Lytcar, B'ham."

R.H.S.

MOTOR CYCLES FOR SALE.

Clyno.

CROW Bros., High St., Guildford, West Surrey agents for the 1919 Clyno. Order now to ensure early delivery. [1553]

Corah.

CORAH-J.A.P., 4h.p., free engine, Bosch, splendid condition, accessories; bargain, or exchange with cash for Morgan.—53, Milton Rd., S.W.14. [2298]

Douglas.

NEW Douglas in stock shortly at Gourlays, Fallowfield, Manchester. [1781]

DOUGLAS, 1915, 2½h.p.; £45, no offers.—George, 23, South Parade, Chelsea. [2476]

4 h.p. Douglas, new condition, only wants seeing; 45 gns.—101, Upper St., Islington, N.1. [2433]

DOUGLAS Motors.—Earliest deliveries, all models. Book yours now.—Briggs, Motors, Wellingborough. [X0492]

DOUGLAS, 1915, 3-speed, 2½h.p. model, horn and tools; £42/10.—Batchelor, Clarence St., Kingston. [2423]

DOUGLAS in Stock, 4h.p. combination, £95; War Office 2½h.p. model, £60, new.—Moffat, Yeovil. 'Phone: 50. [1103]

1914 Douglas, in perfect running order, 2-speed gear, tyres as new; 30 gns.—Blagrove, Chalfont House, Felixstowe. [2287]

DOUGLAS, 1917, 2 speeds, beautiful machine, T.T. mileage 300; £48/10.—51, Maplethorpe Rd., Thornton Heath. [2480]

DOUGLAS, 1915 (late), 2½h.p., 2-speed, T.T., accessories; £42.—Lt. Disney, R.A.F., Rossie, Kingston Hill, Surrey. [2458]

1916 W.D. 2½h.p. Douglas, 2-speed, lamps, mechanical horn, tools, etc.; £52.—Box 2,666, c/o The Motor Cycle. [X2057]

1915 4h.p. Douglas and Coachbuilt Sidecar, splendid condition; £65.—Chandler, Reyre, and Williams, Hitchin, Herts. [2557]

IMMEDIATE Delivery of Douglas military models; 2½h.p. £60, 4h.p. £75.—Gibb, Douglas Expert, Gloucester. 'Phone: 852. [4749]

DOUGLAS, 1915-16 2½h.p., 3 speeds, T.T. bars, almost new tyres; £45; any trial or examination.—Parker's, Bradshawgate, Bolton. [X2114]

DOUGLAS, 2½h.p., 2-speed, new, only done 100 miles, lamps, horn, tools; 48 gns.—W. Ayers, Garage, Kensington Palace. 'Phone: Park 86. [2406]

DOUGLAS, 1913, 2-speed, clutch, kick start, overhauled, and worn parts renewed, excellent condition, economical; £35.—43, Thuraby Rd., Northampton. [X1879]

1915 Douglas, 2½h.p., 2 speeds, all accessories, tools, etc., heavy Dunlops, as new, guaranteed in writing; no approval; £40.—Bird, Foundry St., Northampton. [2409]

NEW Douglas War Models.—4h.p. 3-speed combination, £95; 4h.p. 3-speed solo, £75; 2½h.p. 2-speed, £60.—Hafax Motor Exchange, 18a, Union St. South, Halifax. [2385]

DOUGLAS, 1914, all usual accessories, also speedometer, mileage less than 1,000; would pass for new; £45; exchanges considered.—Bunting, Wealdstone, Harrow. [2416]

DOUGLAS, 2½h.p., 1915, 3-speed, unused 3 years, plate, etc., like new, knee-grips, Klaxon, perfect; £48.—Petty Officer Patterson, R.N.E.S., Cannock Rd., Stratford. [2318]

1915 Douglas, 2½h.p. W.D., 3-speed, in first-class condition, including tyres, several new spare parts, ridden by expert; bargain, £45.—Box 2,670, c/o The Motor Cycle. [X2103]

ON Sale, 1914 4h.p. twin spring frame Douglas, condition as new, 2-speed, and clutch, handle-bar controlled.—Apply, W. Blackwell, 143, Manchester Old Rd., Middleton, Lancs. [X2149]

DOUGLAS, about 1914 model, in good running order, 3 speeds, clutch, and kick starter, lighting set complete; £40.—Lieut. Nicholson, 10, West Cromwell Rd., Earl's Court, S.W. [2387]

DOUGLAS, 1915, 2½h.p., in magnificent condition, 2-speed, Lucas lamps and horn; seen after 5.30 p.m.; a real bargain; must sell; accept £40.—L'arr, 4, Leander Rd., Thornton Heath. [2312]

1915 Douglas, 2½h.p., lamps, horn, knee-grips, mud shields, good Dunlops, and cash in exchange for Matchless combination, 1915, or similar lot; or would sell £48/10.—51, Gleneldon Rd., Streatham. [2414]

LATEST Type Douglas, brand new, only done 100 miles, every accessory, also leather kit with new belt, two new tubes, and Dunlop tyre; cost over £90, sacrifice £70.—Top Floor, 122, New Kent Rd., S.E. (After 5 p.m.) [2247a]

DOUGLAS, 2½h.p., late 1913, 7,000 miles, good condition, lamps, speedometer, spare tubes, many accessories, etc., semi T.T. bars, tested to 120 m.p.g., average 100-105 m.p.g.; at Eastbourne; £35.—Write, Cadet Hubbard, 65b, Lexham Gardens, W.8. [X1884]

ELI CLARK can give you good advice also good deliveries of 1919 Douglas motors. He will help you if possible with spares. The man on the spot.—196, Cheltenham Rd., Bristol. 'Phone: 4169. Wires: Ignition, Bristol. (Please do not send sample spares.) [0968]

MOTOR CYCLES FOR SALE.

Douglas.

DOUGLAS, 4h.p. and 2½h.p., brand new models, in stock. We are stockists and specialists of Douglas machines only, giving the finest service and the greatest choice of models in the South. Over nine years' experience as Douglas agents.—Thompson and Co., 408, Commercial Rd., Portsmouth. Phone: 7105. [2518]

2½h.p. Douglases, brand new, in stock, immediate delivery; fitted 2-speed gears, touring or semi T.T. bars, footboards or footrests, £60; two best lamp sets, horn, registration, writing plates, £4 extra. Enquiries invited. Full specification by post.—Douglas specialists, Robinson's Garage, Green St., Cambridge. [2091]

4h.p. W.D. Douglases, brand new, in stock; immediate deliveries; fitted 3-speed gear, clutch, kick start, £75; with Douglas coachbuilt sidecar, £95; three best lamp sets, horn, registration, writing number plates, £5/10 extra. Enquiries invited. Full specification by post.—Douglas specialists, Robinson's Garage, Green St., Cambridge. T.A.: Bicycles. Tel.: 388. [2090]

DOUGLAS, Douglas, Douglas.—We have had four years with Douglas motor cycles under active service conditions. Our experience and advice are at your disposal. We can supply a few of the famous All-Black Douglases from stock. Guaranteed early delivery of a limited number of all 1919 models. If you are interested in Douglas machines, call and see us.—Vivian Hardie, Ltd., Douglas Experts, 24, Woodstock St. (off Oxford St.), Bond St., London, W.1. (Always open). [0978]

Elswick.

ELSWICK Coach Combination, 3½h.p. twin, 1915, like new, 3 speeds, ridden 200 miles; £49.—Central Garage, Lord St., Southport. [X2146a]

Enfield.

ENFIELD, all models, early deliveries.—J. A. Stacey, Sole Agent, 12, Ecclesall Rd., Sheffield. [X1543]

LATE 1917 Royal Enfield, 2-stroke, 2½h.p., 2-speed, about 1,700 miles; 40 gas.—85, Sisters Ave., Clapham Common. [X2085]

ENFIELD, 3h.p., excellent condition, 1913 twin, accessories; £28.10. Kent.—Box L8,572, c/o The Motor Cycle. [2395]

ENFIELD 1916 Combination, sidecar specially built, all lamps, tools, etc., kick starter, as new; £60.—Morruis, Sedgley, Dudley. [X2053]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries Enfields, all models. [2261]

ENFIELD Combination, bought in 1914, used very little, in excellent condition, lamps, tools, etc.; £55.—86, Hamilton Rd., Wimbledon. [2351]

2½h.p. Enfield Twin, chain driven, B. and B. carburettor, all in excellent condition, to ride away; £18/10.—Woods, Normandy, near Guildford. [2293]

3h.p. Royal Enfield Twin, 2-speed, chain drive, new July 14th, 1917; owner giving up; as new; £50.—F. W. Matthews, Plant Farm, Flitwick, Beds. [1966]

ENFIELD 1916 6h.p. Combination, like new, sell cheap, or exchange 3½h.p. combination and cash; seen any time.—29, St. Leonard's St., Bromley-by-Low. [2426]

1919 Enfields; combination 110 gns., 2-stroke 50 gns., 3h.p. twin 65 gns.; immediate delivery.—Wallace Batchelor, Clarence St., Kingston. Tel.: 1809. [1464]

1916 (Nov.) 2½h.p. Enfield, 2-stroke, 2-speed, guaranteed as new, not done 500 miles, Lucas lamps and horn; 42 gns.—Hensley, West Burton, Aysgarth. [X2131]

1915 Enfield Combination, 6h.p., fully equipped, splendid condition, smart turnout, £63; also 12ft. of Renold chain, ¾x¼, new, 5/- per foot.—Norton, 30, Victoria Rd., Tipton. [X2006]

ENFIELD Combination, Nov. 1914, two F.R.S. lamps, Klaxon, new tyre on back, splendid condition; £60.—P., 92a, Lompt Vale, Lewisham, S.E.13. Phone: 1474 Lee Green. [2307]

ENFIELD 3h.p. 1917 Twin; also 8h.p., plain model, in fine condition, here, 1919 expected soon. Book up to secure.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [2083]

1916 8h.p. Enfield Combination, special 2-seater body, also single-seater torpedo body (interchangeable), 3 lamps, speedometer, horn, whistle, etc.; £110, or nearest.—86, Lewis St., Newport. [X1892]

ENFIELD, 2½h.p., 1914, 2-speed, kick starter, all chain drive, Enfield grey, tyres, head lamp, generator rear lamp, been thoroughly overhauled, perfect condition. Stewart speedometer, tyres unpunctured, under 4,000 miles; £40, or nearest offer.—Hooper, Gt. Parnham, Harlow, Essex. [2506]

ENFIELD 1916 6h.p. Combination, equipped with two mechanical lamps, the lamp sets, trip speedometer, folding wind screen with sides, spare tube, etc., first-class condition throughout, 90 gns.; also 1915 ditto, with Lucas dynamo installation, wind screen, extra heavy tyres, £95.—Parker's, Bradshawgate, Bolton. [X2119]

Excelsior.

1915 Excelsior (British), 2½h.p., 2-stroke, 2-speed countershaft, hand controlled clutch, E.I.C., Senspray, Lucas horn, in new condition; any trial here; £30; date guaranteed.—Jno. Watkins, 7, Bryn Heulog, Aberbeeg, Mon. [2413]

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LEVIS, 2½ h.p., Popular, 2-stroke	£38 0
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MOTOR CYCLES FOR SALE.

F.N.

4-CYL. F.N. and Sidecar, 2-speed, good running order.—13, Nelgarde Rd., Catford, S.E.6. [2469]

4-CYL. F.N. and Sidecar, 5-6h.p., in perfect condition, for sale or exchange other make; £40.—12, Westholme, Northumberland Heath, Erith, Kent. [2461]

Harley-Davidson.

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new Harley-Davidsons. [2262]

1915 Harley-Davidson, 7-9h.p., 3-speed, large coach sidecar, screen, lamps, horn, fast and powerful; £63.—Arthur, 15, Church St., Coatbridge, Scotland. [X2138]

7-9h.p. Harley-Davidson, electric model, Mills-Fulford coachbuilt sidecar, speedometer, etc., run under 1,000; recently cost £150; open to good offer.—Box L8,468, c/o The Motor Cycle. [2236]

HARLEY-DAVIDSON 1915 7-9h.p. Combination, in perfect running order, and most excellent condition, lamps, horn, apion; price £76/10, no offers.—Owner, 27, St. John's Rd., Putney Hill. [2457]

HARLEY-DAVIDSON, late 1915, 7-9h.p., 3-speed, Turner coachbuilt sidecar, hood, screen, 3 lamps, 2 generators, horn, tools, etc., excellent condition throughout; photo; 70 gns., nearest.—Tovey, Tetbury, Gloucestershire. [2462]

HARLEY-DAVIDSON, 1915, and Phoenix sidecar, with wind screen and disc wheel, outfit in first-class condition, and open to any trial and inspection; magneto model, with head light and rear; £75.—Alex Murray, Buker, Dornoch, Sutherlandshire. [2446]

HARLEY-DAVIDSON 1916 Combination, electric model, little used, Cape cart hood, Danhill triple wind screen, special back carrier seat, speedometer, new tyres and spare; £95, no offers; seen by appointment.—Laing, 217, Elgin Av., Maida Vale, London, W.9. [X2035]

Hazlewood.

HAZLEWOOD J.A.P., 1913, 2½h.p., Armstrong 3-speed and clutch, B. and B. top feed carburettor, Bosch mag., lamps, horn, thoroughly overhauled; bargain, £27.—17, Little Ealing Lane, South Ealing. [2283]

1914 5-6h.p. Hazlewood and Canoelet Sidecar, perfect condition, 3-speed, free engine, Bosch mag., J.A.P. engine; £55; been stored 2 years; owner on active service.—F. Clarke, Woodlands, Stewley, Bucks. [2370]

Henderson.

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new Hendersons; price about £98; delivery about April. [2264]

Hobart.

HOBART, 2½h.p., 2-stroke, 1915, good condition; 15 gns.—17, Tamworth Park, Commisdon East, Mitcham. [2376]

HOBART 2-stroke, £22/10; also wicker torpedo sidecar, £12.—6, First Avenue Hotel Buildings, Holborn. [2472]

Humber.

HUMBER, 3½h.p., 2 speeds, Roe gear, handle start, good condition; price £21.—Chandler, Reyre, and Williams, Hitchin, Herts. [2560]

1913 3½h.p. Humber, 2-speed, last used 1915; 19 gns., or exchange Douglas.—31, Nursery Row, Walworth, London, S.E.17. [2473]

HUMBER, 1913 3½h.p., 2 speeds, handle starting, Bosch, B. and B., Duinds, and coachbuilt sidecar; £36.—Jarrett, 130, Bunhill Row, E.C. [2026]

OLD Pattern Humber Bicycle, drop frame, mag., excellent tyres and saddle, in good running order.—Ackling, Ironmonger, Bath St., Abingdon. [X1875]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new 3½h.p. and 6h.p. flat twin Humber. [2265]

1912 Humber and Canoelet Sidecar, splendid condition, ridden only by owner week-ends, been stored two years; price £35.—Apply, Turner, Nursery Cottage, Freezywater, Waltham Cross. [2374]

HUMBER (torpedo), 4h.p., 1914, single speed, adjustable pulley, splendid condition, and just been completely overhauled, Bosch, complete with lamps; £30, or near offer.—Lt. Rayner, Motor Club, Coventry St., London. (D) [2369]

Indian.

1915 7-9h.p. Indian, painted green, kick starter, 28in. wheels, perfect; £45.—21, Montpelier Vale, Blackheath S.E. [X2162]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new Indians. [2263]

5-6h.p. Indian Combination, clutch, and good pulling engine, complete with tools, spares, and Lucas accessories; £35.—Jeffery, 3, Herbert Grove, Southend-on-Sea. [2293]

INDIAN, 1914, 7-9h.p., service green, splendid order throughout, clutch model road racer; absolutely lowest, £35.—Brown, Rangemore Village, Burton-on-Trent. [X2126]

1915 7-9h.p. Indian Powerplus, kick-start, clutch, 3-speed, Dunlops, with sporting coachbuilt sidecar, 3 lamps, Klaxon, tools, engine very fast, in excellent order; £75.—Robinson's Garage, Green St., Cannockbridge. [2549]

MOTOR CYCLES FOR SALE.

Indian.

INDIAN, 7-9h.p., T.T., 2-speed, red, lamp, speedometer, tip-top mechanical condition, good tyres; bargain, £37/10.—Butterworths' Garage, 64, Mill Lane, Brixton Hill. [2460]

1916 5-6h.p. Indian and Sidecar, 3-speed and clutch model, electric lights, coachbuilt sidecar.—Full particulars and trial on application to Box L8,535, c/o The Motor Cycle. [2335]

7-9h.p. Powerplus Indian Combination, Swan torpedo sidecar, engine as new, T.T. handle-bars, Amac carburettor, new tyres; £75.—J.V.P., Roseneath, Woodside Av., Muswell Hill, N. [2468]

1916 Powerplus Indian Combination, 7-9h.p., latest side-by-side valve engine, 3 speeds, foot and hand clutch, kick starter, luxurious Swan sidecar with hood, screen, and luggage carrier, lamps and horn; £75; seen by appointment.—Owner, Ashley House, Cuddah, Cheltenham. [2322]

1915 7-9h.p. Indian Combination, 2-speed, clutch, electric lighting, electric horn, speedometer, plating and enamelling new, large Mills-Fulford sidecar, hood, wind screen, auxiliary seat, tyres perfect, spares, etc.; no dealers, no offers; 85 gns., spot cash.—290, Blackhorse Lane, Walthamstow, E.17. [2315]

Ivy.

1916 2-stroke Ivy, in splendid condition, tyres nearly new.—Douglas Morriss, Sedgley, Dudley. [X2052]

James.

1915 James 4½h.p. Combination, 3-speed counter-shaft, little used; £55.—Eaton Constantine Rectory, Shrewsbury. [2405]

JAMES—Immediate delivery from stock of the 4½ h.p. combination.—Longman Bros., 2, King's Parade, Acton. Phone: 1578 Chiswick. [2529]

31h.p. Late 1917 Twin James and light sporting sidecar, in perfect condition, guaranteed, lamps, etc.; £65.—Seymour, 6, Ringstead Rd., Catford, S.E. [2519]

JAMES, 3½h.p. twin, 3 speeds, new spare cover and 2 tubes, purchased new 1917, very little used, in splendid condition throughout; 52 gns.—Rowe, 140, Church Rd., Hove, Brighton. [2363]

RIDER TROWARD and Co., 31, High St., Hampstead.—James machines. Delivery this month, new 5-6h.p. twin combination, £104; 4½h.p. solo, £79; combination, £99; delivery February, 3½h.p. twin, £79; March, 2½h.p. 2-stroke. Orders accepted in strict rotation. [2267]

Kerry.

KERRY-ABINGDON, 3½h.p., Bosch mag., B. and B. carburettor, belt, tyres, plating good condition; £23.—35, Southerton Rd., Hammersmith. [2364]

Levis.

LEVIS—Order now for earliest deliveries of 1919 models.—Longman, Fisherton St., Salisbury. [2358]

LEVIS Popular, new 1918, 200 miles only, lamps, etc., spare belt; £30.—Lawn Bank, Keats Grove, N.W.3. [2515]

LEVIS Popular, 2½h.p., perfect condition; £23/10; owner on active service.—F. Clarke, Woodlands, Stewley, Bucks. [2371]

1915 Levis, 2½h.p., just overhauled, new Dunlop studded tyres, horn, Amac, drip feed; £22/10; Maclean, H.M.S. Royal Sovereign, c/o G.P.O. [X2004]

RIDER TROWARD and Co., 31, High St., Hampstead.—Levis. Delivery this month, Model E, 2-speed, clutch, £52/10; Popular, £38. Orders being booked in strict rotation. [2268]

LEVIS—For the earliest possible delivery of 1919 models, advance specifications of all models, sole district agents, The Walsall Garage, Wolverhampton St., Walsall. Phone: 444. [X20127]

LEVIS, 1914, 2½h.p., 2-speed, been carefully looked after, fitted with beautiful lighting set, and tools, etc. (worth £3/10); spare £34/10, no offers.—Senie, 13, Market St., Tamworth, Staffs. [X2093]

LEVIS Model E, 2-speed, £247/10; actually here; Popular Model delivered in 7 days, £38; also 1915 Popular, £27/10.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [2082]

LEVIS, Levis, Levis—A limited number of Popular and 2-speed Model E. for guaranteed early delivery. If you are interested in 2-stroke motor cycles, call and see us. Sole wholesale agents for London district.—Cars and Motor Sundries, Ltd., 24, Woodstock St. (off Oxford St.), Bond St., London, W.1. (Always open.) [0979]

Martin.

4h.p. Martin-Jap, 3-speed, clutch, splendid condition. £28; 4h.p. New Hudson, J.A.P. 3-speed, clutch (gear incomplete), £20; Bramble light sidecar, coach, as new, £10.—13, New St., Wellington, Salop. [X2054]

Matchless.

MATCHLESS, early deliveries.—Sole Agent, J. A. Stacey, 12, Ecclesall Rd., Sheffield. [X1544]

MATCHLESS Actually in Stock, latest 5h.p. combination, with spare wheel; £140.—Parker's, Bradshawgate, Bolton. [X2116]

MATCHLESS Victory Model Combination actually in stock, with spare wheel and tyre; £140; seen by appointment.—J. Tassell, 1a, Bloomfield Rd., Plumstead, S.E.18. [1606]

MOTOR CYCLES FOR SALE.

Matchless.

CROW Bros., High St., Guildford, West Surrey, agents for the 1919 Matchless. Order now to ensure early delivery. [1532]

RIDER TROWARD and Co., 31, High St., Hampstead.—Matchless. Earliest delivery Victory model combination, £140. [2263]

MATCHLESS—Special contracting agents for post-war Matchless models; earliest deliveries; exchanges and easy payments arranged.—Maudes', 100, Gt. Portland St., London, W.1. [19920]

1918 Matchless Combination, Victory Model, complete, spare wheel, Lucas lamps, Klaxon, 100 miles only, absolutely like new; £130, cost £147.—40, Castelnau Rd., Barnes, London, S.W. [X1611]

MATCHLESS Combination, late 1912, 6h.p. twin J.A.P. waterproof Bosch mag., Amac, tyres as new, enamel and whole machine in condition as new and ready for the road; £35, or exchange lightweight Douglas preferred, cash adjustment either way.—J. Beale, 58, Broadwall, Samford St., Blackfriars. To be seen between the hours 7 a.m. to 12 noon, 6 to 8 p.m. [2302]

Metro.

TYLER-METRO, 2½h.p., 2-stroke, 2-speed, recently overhauled, good tyres, Lucas lamps and horn; £25.—Carpenter, North Bar, Banbury. [X2002]

METRO-TYLER Sporting Lightweight, disc wheels, exactly as shown advertisement, page 17, "The Motor Cycle," January 2nd, only done 180 miles, 26 gns.; Thomson-Bennett magneto, soiled only, £3/19.—Jackson, 7, Osborne Rd., Brimsdown, Middlesex. [2453]

New Hudson.

NEW Hudson Lightweight, J.A.P. engine, 3 speeds, good condition throughout; £16/10.—Central Garage, Lord St., Southampton. [X2146]

1914 New Hudson, 3½h.p., 3-speed, clutch, lamps, etc., perfect running order; £29.—Lester, 8, Hamway Place, Tottenham Court Rd., W. [2390]

1915 New Hudson Combination, 3½h.p., 3-speed gear box, lamps, speedometer, lovely turnout; £68, offer.—24, Beavall Rd., East Dulwich. [2378]

NEW Hudson 1914 6h.p. Combination, 3-speed, lamps, horn, speedometer, etc.; £60.—Myham and Co., 197, London Rd., Croydon. Phone: 2379. [2489]

NEW Hudson, 1914, 3½h.p., 3 speeds, clutch, kick start, Bosch, original tyres, stocked 3 years, lamps, etc.; owner disabled; £38.—93, Northwold Rd., Clapton. [2502]

1914 New Hudson, 2½h.p., 3 speeds, first-class order, exchange good combination with cash, sold £28, also free engine hnb wheel complete, £2.—S. Cathcart, Nolly Rd., Braintree. [2474]

New Imperial.

1917 New Imperial, 2-speed, as new; £35.—Chandler, Reyre, and Williams, Hitchin, Herts. [2564]

CROW Bros., Guildford.—New Imperial, all models new and overhauled second-hands stocked. [19778]

NEW Imperial.—All models for immediate delivery.—J. A. Stacey, Sole Agent, 12, Ecclesall Rd., Sheffield. [X1545]

NEW Imperials, sole London agents.—2½h.p. 2-speed 1919 models in stock; trade supplied.—Reys, Euston Rd. [1309]

NEW Imperial Combination, 8h.p.; immediate delivery; 109 gns.—Exeter Motor Cycle and Light Car Co., Ltd., Bath Rd., Exeter. [0958]

NEW Imperial Motor Cycles.—2-speed, standard, and lady's models in stock for immediate delivery; no permits required.—P. J. Evans, 91, John Bright St., Birmingham. [0956]

NEW Imperial-Jap, 2½h.p., 2-speed Albion gear, tyres and condition almost new; £25, no offers, or will exchange with cash for good combination.—E. Sna Hotel, Stevenage, Herts. [X2101]

NEW IMPERIAL 1919 8h.p. Combination, £126; also 2½h.p. lightweight tourist model, 48 gns.; exchanges.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [2546]

New Ryder.

2½h.p. 1916 New Ryder-Jap, 2-speed gear, in good condition; £35 cash.—Box L8,595, c/o The Motor Cycle. [2542]

Norton.

NORTON—Early delivery assured by placing your order with Parker's, Bradshawgate, Bolton. [2118]

1919 Norton, all models; immediate delivery.—Walter Batchelor, Clarence St., Kingston. Tel.: 1465. [1465]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new Nortons. [2266]

NORTONS—We are now booking orders for the latest model Nortons, solo and sidecar outfits; £5 deposit; deliveries in strict rotation.—Maudes', 100, Gt. Portland St., London, W.1. [1442]

N.S.U.

N.S.U. 3h.p. 2-speed Motor Cycle, new E.I.C. mag. and new B. and B. carburettor and new spare belt; £11; if sidecar, £3 extra.—E. White, Melplash, Dorset. [2470]

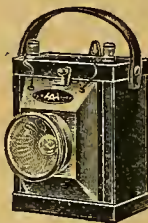
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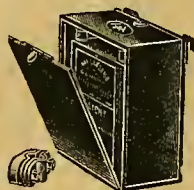
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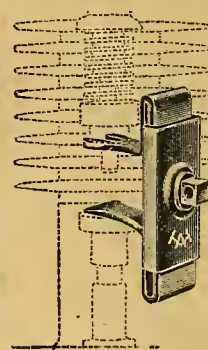
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FLASH TYPE DRY BATTERY. Price 14/3 each.



SPECIAL BATTERY
CARRYING CASES. From 9/- each.



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Affords fullest protection against severest weather. Fitted with special celluloid cover, and new extra strong adjustable clip. Fig. 395. Price 6/- each.

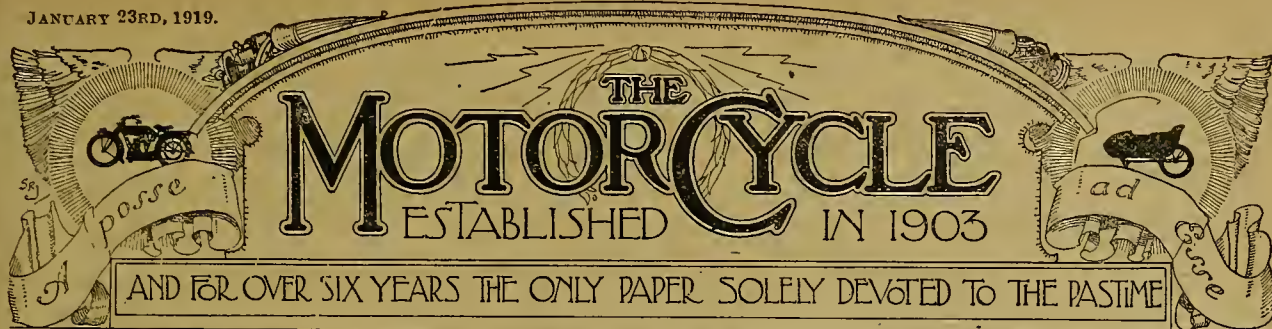


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Adjustable clip, universal movement, detachable lamp. Fig. 361. 9/- each.

Operates with an ingenious cam action, and will lift the strongest springs easily. Only measures 2½in. over all. Automatically holds spring up until released by turning nut.

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COLONIAL AND FOREIGN AGENTS:**UNITED STATES**—The International News Agency, New York.**CANADA**—Toronto News Co., Ltd., Toronto; Montreal News Co., Ltd., Montreal; Winnipeg News Co., Winnipeg; British Columbia News Co., Vancouver; Gordon & Gatch, Ltd., 183, Bay Street, Toronto.**AUSTRALIA**—Gordon & Gatch, Ltd., Melbourne (Victoria), Sydney (N.S.W.), Brisbane (Queensland), Adelaide (S.A.), Perth (W.A.), and Launceston (Tasmania).**NEW ZEALAND**—Gordon & Gatch, Ltd., Wellington, Auckland, Christchurch, and Dunedin. **INDIA**—A. H. Wheeler & Co., Bombay, Allahabad, and Calcutta.**SOUTH AFRICA**—Central News Agency, Ltd.**PARIS**—Smith's English Library, 248 Rue Rivoli.**The A.A. Fuel Campaign.**

FROM January to September last year *The Motor Cycle* dealt continuously with the fuel problem in its various aspects. For years before we had pointed out on every possible occasion the importance of developing and encouraging the home production of fuel that would mean so much should foreign supplies be cut off at any time. The war has conclusively proved the truth of our opinions, and at last both the Government and fuel users are thinking of action along lines that should have been followed long ago.

In various issues we called upon those dependent on fuel supplies for their business or their pleasure, and on those who exist for the purpose of looking after the motorists' interests, to give special attention to the fuel question and to consider seriously what could be done to prevent a recurrence of the unfortunate state of affairs through which we all suffered during the last two and a half years of war. We appealed to the private motorist, and we appealed to the business user of mechanical road transport. We appealed to the manufacturer of motor cars and cycles, and with special vigour we appealed to the private motorists' associations.

The business user has taken action only recently, and the result of his action—through the Commercial Motor Users' Association—has been the suspension of the Government proposals for the taxing of home-produced benzole. This is a great victory, and one from which all motorists will profit. The private motorist has taken action in the forming of a new league to protect his interests—a step that is at present passing through the preliminary stages only. And now the private motorists' association with the largest membership is taking the matter up.

A motor fuel campaign is being undertaken and extensively advertised by the Automobile Association. Stated briefly, the main points of the campaign are State control of fuel prices and encouragement of home production and home-

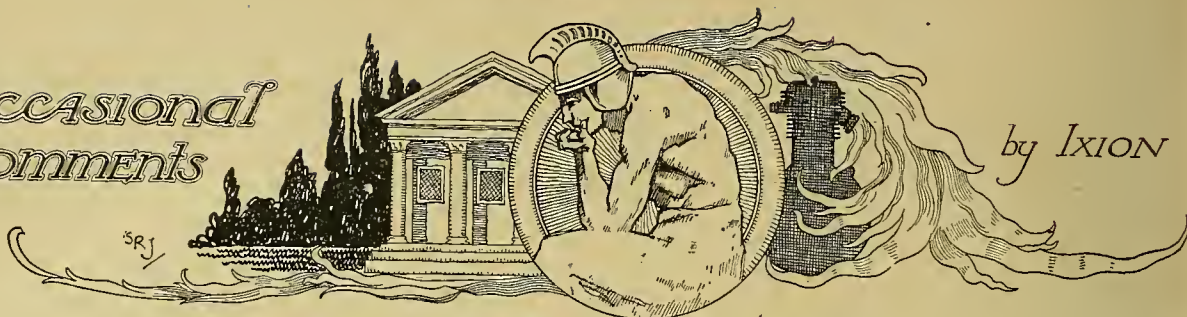
produced fuels. More laudable objects would be difficult to conceive. Will they be realised? We think they will, but only on one condition, and that is that the universal support of the whole motoring community is forthcoming. All motorists should sign the form and return it to the A.A., for we assume that, although the form is primarily intended for members, the Association will more than welcome support from all.

The necessity for something of the kind is becoming more and more evident every day. Although the Petrol Controller is increasing the amount of fuel which we may hope to obtain, he is not making the fuel any cheaper, and nothing is going to do more harm to all forms of motoring than the absence from the market of a reasonably-priced fuel. The petrol companies have actually told us the price they charge for their product is what the public can be forced to pay, and it has come as a shock to many of us to find that the benzole producers are apparently adopting a similar attitude. They are doing themselves more harm than good, for, instead of building up a market while they have the chance, they are destroying its probability.

Speaking generally, the average motorist may be called a conservative individual—as far as his motoring goes, that is—and he is not going to risk the use of a fuel of which he knows nothing so long as he gains nothing. When he has tried benzole he will be quite willing to buy it at the same price as petrol, because he will know that by so doing he is serving his own interests and also actually cutting down his running expenses, as the m.p.g. with benzole are better than with petrol.

Other home-produced fuels are nearer than many people imagine. Many schemes are on hand, and they are not all bad. The A.A. wants to act as the protector and is well qualified for the rôle—provided that general outside help is forthcoming. We hope that it will be, and commend the whole scheme to our readers for their serious consideration.

Occasional Comments



The Big Fellows.

I AM a little disquieted about present motor cycling tendencies. The financial future is completely uncertain. The 500 c.c. type of machine is temporarily listed at £80 or thereabouts. Optimists glibly assert that by 1923 prices will have fallen 40% or so, and we hope they are right; but a glance at the political situation in this and other countries indicates that in 1923 prices *may* be where they are, or worse. In the meantime, light cars average £300 or so, and even the Ford is £250. These cheaper grades of motor always found their special market among the middle class: and as the middle class sustains a unique and special squeeze-in most tightenings of the money market, the rise in prices coincides with the impoverishment of buyers. So I am driven to speculate about the passenger market, and there are thousands of buyers who must say:

"I want a passenger motor."

"I cannot afford a light car."

"I must choose between a cycle car and a sidecar."

His Decision.

AT the moment there is very little choice in cycle cars. The G.N. is listed at £160-£170; the Morgan at £132-£145; the A.V. at £130 (?); whilst the figures for the A.B.C. and the A.C. Bantam are not announced. There remains the sidecar. The sidecar market falls into two classes—the utilitarian single-cylinder, bought chiefly for heavy duty by men of limited purse: and the two or four-cylinder *de luxe*, which represents everybody's ideal in this class. I cannot see the quondam cycle car or light car man with prolonged experience of high-powered, smooth-running engines reconciling himself to a one-lunger, however excellent. But just as the British machines are supreme in the 500 c.c. sidecar class, so—beyond all question—have the Americans captured public fancy in the 7-10 h.p. sidecar class. Moreover, there is a marked tendency amongst leading British firms to reduce their c.c. The Douglas Co. have won their reputation on 350 c.c. A new and very powerful syndicate is plunging on 400 c.c. We have yet to hear of any really big British concern going out baldheaded for the sidecar *de luxe* market, unless the A.J.S., Clyno, and Matchless people intend to concentrate upon it. I want to see a few of our most capable designers catering for the passenger market, whether by cycle cars or sidecars. Otherwise, just as America has already captured our cheap car market, so will she pinch our passenger *de luxe* market. Tariffs strike me as a coward's castle. We have beaten the world in point of design over almost the whole field of munitions. If we omit the French

75 mm. gun and a certain heavy lorry, we need fear no comparison. I am certain we can sweep the board as masterfully in motor design, given the necessary statesmanship in the framing of policy. At present we are very much on the defensive in the sphere I have outlined, *i.e.*, we have cause to fear that the motorist who wants a vehicle to carry his girl and himself cheaply, swiftly, and comfortably, will send his money abroad.

The Value of Speed Records.

I SEE my colleague "Road Rider" writes slightly of speed records, regarded as a means of informing the buying public. Their usefulness can certainly be over-estimated. Nevertheless, if a machine persistently gains and regains the hour record, I am unquestionably informed that its designer knows his job. He can plan an engine which embodies efficiency and stamina in a very high degree. Moreover, I may take it for granted that he knows how to balance an engine, for an ill-balanced engine is not likely to maintain maximum revs for an hour without trouble. In fact, if I like the 'bus in which he mounts his standard engine, I have only one question left unanswered. Is he an honest man? Does he use a single very expensive "star" engine to advertise his name, and then unload shoddily built 'buses upon a credulous public? Or does he put the brains which inspired his Brooklands 'bus into the perfection of a stock touring machine? In other words, I can size up these speed advertisements by a close inspection of the sister road machine. Finally, it must be granted that it takes a good engineer to design a machine capable of winning the hour record at modern standards, and a good workshop to build a 'bus which will stand the racket.

Hinged Back Axles for Cycle Cars?

READERS of our sister journal *The Autocar* may have noticed that the A.B.C. people have a big sporting car on the stocks, of which the rear axle is a peculiar feature. It is, so to speak, hinged at the centre like the axle of a Sopwith aeroplane undercarriage, and the rear springs consequently run across the track out from the centre of the axle towards the road wheels, the latter comprising the only unsprung weight at the rear of the chassis. This design is based on the following theory: The first duty of a spring is to keep the unsprung weight pressed down upon the road regardless of its inequalities. When the spring's resistance is overcome by a specially bad bump, its second duty is negative in character—*i.e.*, it must not rebound and push the body upwards. With a large unsprung weight (*e.g.*, a very

Occasional Comments.—

heavy axle, two wheels, etc.) a very stiff spring is necessary to road adhesion; but a very stiff spring will push the body up. With a small unsprung weight (e.g., nothing but two wheels) a light spring suffices for road adhesion, and when a bad bump is encountered there is no bouncing, for the spring is too weak to push the body up. This system appears to have distinct possibilities for cycle cars.

A Suitable Transmission ?

IT is no easy matter to devise a suitable transmission for an axle which is in the habit of curtsying amidships. The double bevel pinion drive to a pair of crown wheels is out of the question in a cheap grade of cycle car. Side chains are ruled out by the fact that the sprockets will lean inwards when the axle bows. On the other hand, the divergence from vertical alignment is not too big for belts. I have not lost hope of the final belt drive for cheap cycle cars, and I commend a consideration of this type of axle to anybody who is thinking out a belt-driven four-wheeler. He might further consider the idea of endless belts, with which a breakage would be practically unknown until the belt as a whole was just about worn out.

The Joys of Good Lighting.

CAN remember the days when acetylene lamps were so bad that we occasionally carried an oil lamp in reserve in a box on the carrier. When motor cycles were born lamps were fitted with the spring hinges still characteristic of push bicycle lamps, and the vibration soon broke the hinges. If by any chance the spring survived a long night ride it was long odds against the generator continuing to generate. In these times 10s. 6d. was regarded as a high price for a lamp, and the first satisfactory sample that came my way cost 8s. 6d., and was presumably a Hun, as its name was Schmidt. Then Lucas brought out a glorified push bicycle lamp, with a springless box clip, which

slid over the ordinary push bicycle type of bracket and was secured by a milled nut. This usually worked well until the rigid forks hit a large hump in the road, when the lamp generally did a short vertical climb, and nose-dived steeply to a bad landing crash. Some years ago lamp makers went over in a body to the car type of two-prong bracket and the separate generator. Since when our troubles have chiefly been due to—

1. Impatience during the magic period known as "waiting for the smell." (Irascible individuals turn on too much water and flood the charge.)

2. Carrying a charge of carbide in the generator for months before use. (This reduces it to snuff, and chokes up the valves and the burner.)

3. Absence of a serviceable spare burner. (The burner in the lamp is carboned up. The spare is either in one's pocket, and, *ergo*, choked with tobacco; or in the toolbag, and, *ergo*, choked with French chalk or rubber solution.)

The great merit of the dynamo set is that it is proof against all these little human foibles. Motor cyclists are such careless beings that they provoke acetylene into giving them variegated trouble. But I don't think any of us will dare to carry spare electric bulbs in pockets or toolbags; and on a 1914 sidecar outfit the possession of a dynamo plus a spare bulb spelt almost complete insurance from lighting troubles. We are all palpitating with eagerness to know whether the electricians have evolved suitable batteries for solo sets. Somewhere in England there is a man looking for me with an axe. Early in 1915 I sold him a solo mount fitted with electric lighting. He is now a pessimist. He believes that a future Napoleon with some such name as Schweitzevkoffski will shortly invade England at the head of a united horde of Russian and German Bolsheviks. My lighting set is the key to his dreams. So we are anxious to test those promised solo sets.



RURAL SCENES IN WINTER.

The lady motor cyclist's ideas and desires will in the future have to be considered even more than in the past. The work women have done in the R.A.F. and other branches of the Services has had its effect in creating hundreds of potential buyers of motor cycles.



OUR FIRST JOY RIDE

IT was our first joy-ride. As I tucked myself into the sidecar I asked myself was ever a girl more utterly content than I, on this sparkling winter morning of frost and pale sunshine? Our destination was the little Scottish station seven miles distant, whither we were informed we must go to bring away the New Year hamper that lay there for us, and on the return journey we were to make a *détour* in order to see a house which, according to local report, would provide us with just such a home as we had come into this Highland country to seek.

Contentment.

In Jimmy (my husband) lay the foremost reason of my contentment, since here he was, free once more, and well, after hard service in France. He started the engine, and away we went along the winding road-way. Ahead of us lay the snow-capped mountains, on the far side of which lay Loch X and our destination. There were pike in the loch, and lovingly I fingered the rod and net beside me. If we reached that loch in good time there were heavenly possibilities ahead!

A little while later, with the hamper reposing snugly at my feet, we were climbing steadily up the narrow mountain road which took us every moment further and further from civilisation. How nobly the Scott raced along with its heavy burden! All who know the rhythmic "whirr" of a Scott engine, so like the drone of an aeroplane, will appreciate the keen exhilaration that was ours as, perfectly tuned and perfectly controlled, it bore us on and up. Only once, indeed, has this machine, though possessing two

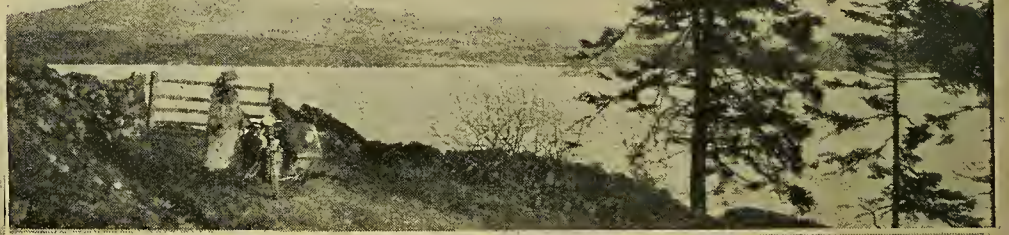
speeds only, failed us on these steep mountain gradients, and that was on a day when the road was a veritable quagmire, the wind, almost a gale, dead against us, and when, too, we had a heavy load aboard.

On we went. Here a startled rabbit tore across the track in front of us; now a pack of grouse with their blood-stirring cry, "Come back, come back, come back!" flew angrily overhead.

"Oh! for a gun!" called Jimmy, as his keen eyes detected a gorgeous cock pheasant crouching motionless in the tufted grass.

Alone with Nature.

Several times we saw whole families of black cock in whitethorn trees eating the winter berries. Bleak and bare was the landscape now—no sign of human habitation anywhere—just the silvery stretch of road ahead of us cutting its way along the hillside. Numerous black-faced mountain sheep which, not having lived in pre-war days, stared in stunned amaze-



The Scott sidecar on the shores of the "wind swept" loch from which the salmon and pike were taken

ment at the strange outfit approaching, and remembered to turn and run only when we were well past them.

Shortly after noon we were examining every hole and corner of "our house." Originally

Our First Joy Ride.—

there must have been two cottages which later had been built into one, and the result to-day is a rambling little dwelling, unconventional in style no doubt, but well constructed and charming to look upon.

Straightway we fell in love with it, and, finding the interior equally agreeable, decided we would come to terms with its owner at the earliest opportunity. Outside there was a little garage-upon which Jimmy bestowed abundant and detailed attention, while I gave equally engrossing scrutiny to a couple of, good poultry houses, making complicated calculations the while. Beyond these buildings was a stretch of pine plantation, through which unmistakable sounds spoke of a burn. As we approached, a pair of beautiful white-tailed deer broke from cover and disappeared like flashes of lightning into the shadowy depths beyond. Truly this is a country of ever-increasing fascination!

Then, having looked into all practical matters, we sat ourselves on the front door step and feasted—literally feasted—ourselves on the view, as well as on sandwiches, which Jimmy produced from the pocket of an exceedingly grimy trench coat. At our feet lay the loch, wind-swept and immense; wild duck flew overhead; teal chattered on its surface; and on the near shore lay the little green and white boat which was to be ours also. On the far side stretched the

hills, calm and majestic, and on a really clear day it is said one can see right away to the far-off hills.

Soon we were in the boat, the pike rod in my eager hands, while Jimmy gamely looked on from behind the oars, and ten minutes later came the crowning triumph of our glorious day. There was a sudden bending of the rod, out screamed the line, and I knew I had a monster at the other end. As I drew in slowly the strugglings and splashes grew more and more violent, and our excitement surpassed all limits when finally Jimmy landed at my feet a huge—salmon! The first salmon I had ever caught, but—it was out of season! Each of us tried to stifle the insistent calls of conscience. But it was no good. Gently we unhooked the beautiful creature—king of all the fishes—and lowered him into the sparkling water. Then we sighed big, big sighs, and thereafter, as a reward for virtue, caught a couple of fierce but plump pike.

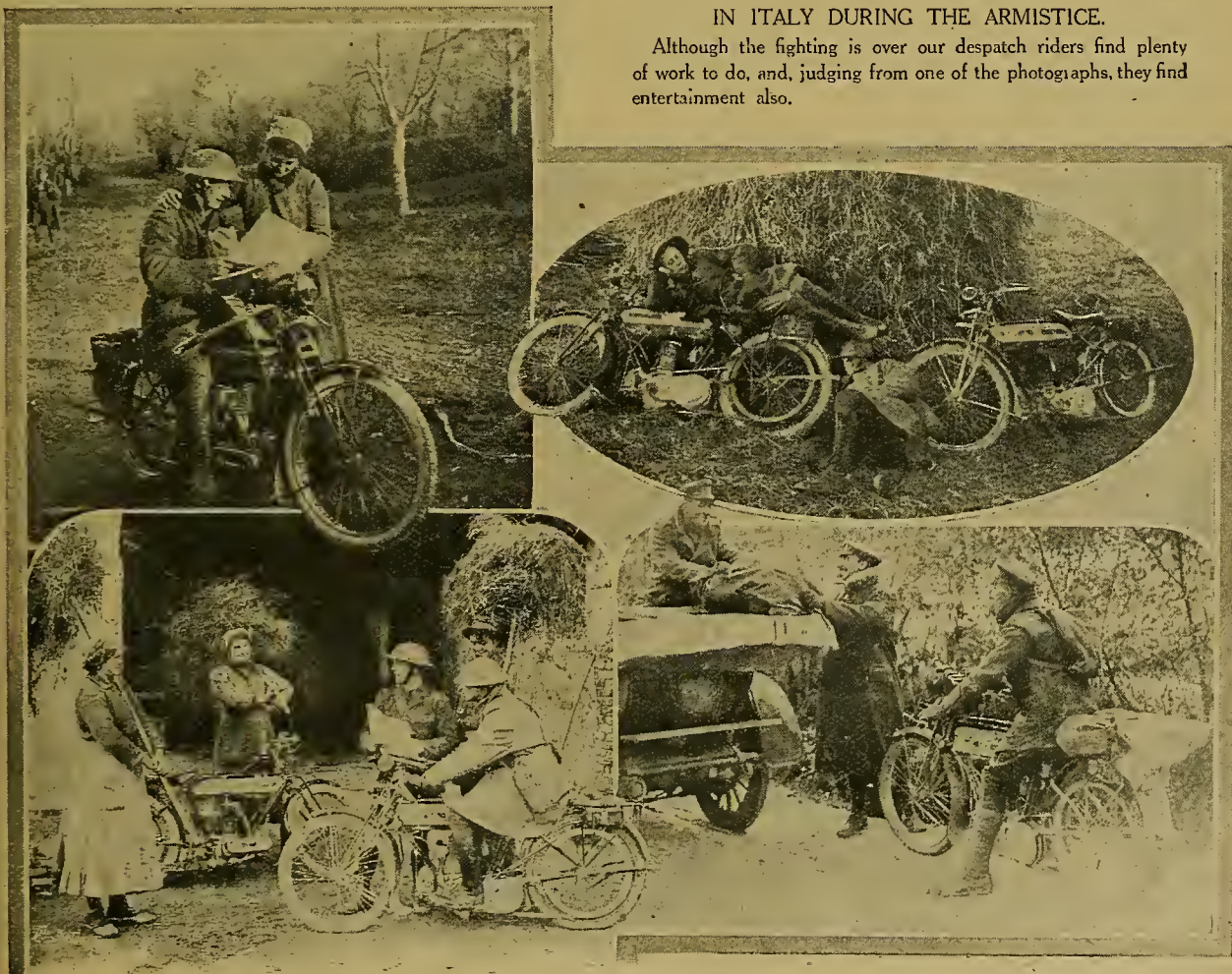
The sky was a fiery, triumphant red behind the snow-covered hills as our "jigger" bore us down the mountain track in the late afternoon, and, as the white-walled cottages of the village in which we are now staying hove in sight, Jimmy and I agreed that it had been a glorious day.

Thus ended our first joy-ride. Truly, with the war at an end, what more can healthy mortals desire than a powerful sidecar in a sporting, beautiful country such as this?

SHEILA.

IN ITALY DURING THE ARMISTICE.

Although the fighting is over our despatch riders find plenty of work to do, and, judging from one of the photographs, they find entertainment also.



OPINIONS.

Notes on the Past, the Present, and the Future. By Prominent Men in the Motor Cycle Movement.

FOURTH SERIES.—Comments of Competition and Other Well-known Riders.

From Mr. Archie G. Cocks, Competition Rider.

DURING my travels up and down the country in the past few months I have heard many motor cyclists voice their views on the type of machine which will be most popular in 1919.

The majority of these riders are more or less of the same opinion as myself—that is, that the only motor cycle worth riding in the future will be of the spring frame variety, preferably with an engine of about 8 h.p.

The transmission must be all-chain, totally enclosed in substantial chain cases, which must be easily and quickly detachable, and, moreover, they must be as quickly and easily attached again.

In the past, we have seen many chain cases which could be detached with ease in five minutes, but these same chain cases took at least five hours, plus five screw-drivers, to attach again, to say nothing about the enormous amount of unparliamentary language.

This type of case must vanish for ever, as I am absolutely certain that the 1919 motor cyclist will have no use for it.

Of course, there will always be a number of motor cyclists who will be unable to afford the above type of outfit, and for these riders a really efficient spring seat-pillar on the machine and a spring sidecar wheel will be demanded.

After very many thousands of miles riding on outfits fitted with either a spring frame or

a spring seat-pillar, I would never again ride an outfit without one or the other.

There is one other type of sidecar outfit which I feel certain will find favour with a small percentage of riders, particularly the elderly ones, and that is the two-seater sidecar with all the controls taken into the sidecar and either steered by means of a wheel or tiller, so that the driver has the same amount of comfort as the passenger.

After many thousands of miles experience in one of these outfits, which I built as an experiment, I have come to the conclusion that, for the elderly rider, and particularly in the winter, this type of outfit has many attractions.

There is one other fitment I feel sure will be demanded by a number of riders for several years to come, and that will be a really efficient paraffin vaporiser, as I am convinced that it will be a long time before petrol becomes really cheap again, if it ever does. At any rate, whatever the price of it is, paraffin will always be about half the price, and to the motor

cyclist who has to consider his running expenses paraffin will always hold out attractions, provided it be properly vaporised.

The two-seater sidecar I have previously mentioned has always run on paraffin or other heavy fuel, and so efficient is the vaporiser that the engine is as good, and develops as much power to-day, as it did the day it was made, and I for one shall continue to use paraffin as fuel until I find a fuel as good as petrol at the same price as paraffin.

From Mr. George Brough, A.M.I.A.E., Trials Rider and Designer.

I AM very optimistic about the prospects 1919 and the following years have in store for motor cyclists. Thousands of pounds' worth of machinery will be diverted from the manufacture of all kinds of munitions of war to the production of motor cycles in large quantities.

Scientific research has shown us how to reduce the weight of our engines, with an increase in power output. New and better shop methods assist standardisation. Concentration by one factory on one model will enable each individual firm to pay attention to the dozens of details which require attention before we can claim that our trusty bicycles are as free from trouble as are high-class cars.

I am of the opinion that we shall soon see the exodus of the luxurious high-powered combination. I think the next show will confirm this. However, the sidecar enthusiast, the potterer, and the business rider will all be catered for when Olympia next opens its doors, and the purely solo man who wants the fastest thing on wheels with complete equipage will find it will not be necessary to buy an over-engineered machine weighing 150 lb. too much, because it happens to have been designed for sidecar work.

From Mr. George King, Popular Clubman and Follower of Trials.

FOR the future of the pastime and sport of motor cycling, I think competitions and trials ought to be made a very strong point, as in the past. Pre-war trials and hill-climbs created the past popularity of the motor cycle, and this kind of encouragement will, I am sure, bring back the old enthusiasm to pre-war motor cyclists and create it for the new comers to our fraternity.

There is no doubt a very great future for the motor cycle, and, with the help of *The Motor Cycle*, a wonderful industry will be ensured.

From Mr. H. Mortimer Batten ("Chinook").

LOOKING into the future, a question of immense importance seems to me to be the problem of road construction. An enormous increase in fast-moving road traffic is bound to take place during the next few years, and one's recollection of the dust nuisance, even in pre-war days, is painful. In the future there will be more motor 'bus services, more road-tearing lorries, more trackless cars, more touring vehicles and motor cycles than ever before; and if there is to be any pleasure in road travelling, if the health of the nation is to be considered, radical alterations must take place in road construction.

Of road users, the motor cyclist is probably the worst sufferer, since he travels at speed without protection, but his case is by no means so bad as that of villagers and country dwellers whose houses are situated at the roadside, and who throughout the summer months are simply enveloped in dust. This state of affairs, apart from entailing financial loss, has done considerable harm to the pastime, and the sufferers do not appreciate that it is not the motors that are to blame—that it is the road authorities for not keeping pace with the times. The motor is inevitable and a blessing to civilisation, and one cannot bring about an evolution in road transportation without the necessity arising for similar evolution in road construction.

There are difficulties. The writer's village, for example, consists of a main street standing on a gradient of about 1 in 16. The villagers refuse to have the surface tarred on account of the resulting slipperiness for their horses: they choose rather to live in an atmosphere of dust—many of them rejoicing in the fact that thereby they derive a real grievance against the motorist! The war, however, and progress in agriculture have removed a good deal of this rural pigheadedness, and it now remains for motorists and anti-motorists to pull together in the direction of general road improvement—a question which involves the health of practically everyone.

From Mr. Eric Williams, D.C.M., Winner of the Last Junior T.T.

I NOTICE, with satisfaction, that some manufacturers are taking up the American system of concentrating on one or two models, making parts standard and interchangeable throughout, so in future let us hope our spare parts will



Mr. Archie G. Cocks.



Mr. H. Mortimer Batten.



Mr. Geo King.

Opinions.—

not want a lot of fitting, which was often the case pre-war. But why not take it further and make chief distributing agents or centres for large areas, say, six or eight, in the British Isles? These centres would do the whole business for their firm in this area in supplying new machines (appointing their own sub-agents), effecting repairs which would otherwise go to the manufacturers, and carry a large stock of spare parts, which could be despatched to private owner or sub-agent within a short time of the known requirements.

Now, regarding competitions, one must admit that in 1914 in many of the trials it was as much an endurance test for the rider as for the machine. This now, when a lot of us have been through the "mill" a little with the Boche, and our health not what it might be, makes us shudder at riding through what we did in pre-war days. If the A.C.U. would take stock machines from the show windows and then put the trade riders on them, we should find results more interesting and useful with less rough riding, and the better standard machine would come out on top; also, it would be much more fair for the private owner competitor.

From Mr. J. S. Holroyd, T.T. and Competition Rider.

IN view of the great interest with which the motor cycling public are awaiting 1919 productions, it seems to be rather an opportune moment to say a few words regarding what I term my ideal mount. To commence with, it must be a turn-out with which I can enter any reliability trial, and the very expression "reliability" infers, to me, an indescribable charm. How many anxious moments have I spent on account of unreliability in bygone days, but never again.

For my power unit, I would like a 1,000 c.c. 60° twin engine having a heavy outside flywheel. I like an outside flywheel for many reasons, not the least of which is that it does undoubtedly obviate indulgence in gymnastic contortions when "starting up" on a frosty morning. Some of my readers may like this form of exercise, but I do not. Again, my simple mind is enthused by an engine which, when required, will just "tick over" with a perfectly equal value in each explosion, and I believe that the outside flywheel will give me this, admitting that carburettor adjustment is good.

For my present purposes, I can afford almost to ignore technicalities, but let me say that the main bearing on the flywheel side must



Mr. J. S. Holroyd.

have a minimum length of at least two and a half times the diameter of the shaft, and on the timing side I would have a ball bearing. This would mean lifelong wear, provided the oiling system were perfect.

So we could carry on with these niceties *ad infinitum*, but lest I should be accused of suffering from mental indigestion, I must hurry through other details. Let the frame be of the loop type, supported by wheels having 28x3in. tyres, Brampton forks, 2½in. tyre clearance in 8in. mudguards, and, mark you, I for one do not want the magneto to share duties with the front mudguard.

From Mr. A. C. Robbins, Successful Competition Rider.

RELIABILITY is the most important item with the majority of riders, and this has to be tested and proved during next season in open competition. In the majority of runs, a machine is only called upon to average 20 m.p.h.; therefore so long as the general appearance of the machine at the start and finish of a trial is good, it stands the same chance as a more speedy and scientific model.

Up to the present the single-cylinder has been the most reliable mount, as witness its wins in nearly all the most important events, and I commend this type to all beginners as the best and most suitable machine. In all my competitions I have ridden a single-cylinder, but if the twin were as reliable I would prefer this type in future. It would have to be a fairly high h.p., so as to take a sidecar when required.



Mr. A. C. Robbins.

Owing to the advanced methods of engine construction, I expect some manufacturers will be able to give us a 3½ h.p. equalling a pre-war 6-7 h.p.

Altogether, I think we can look forward to a very promising and interesting year, and if all goes well the Motor Cycling Club should be able to hold its annual run to Edinburgh next Whitsun.

From Mr. H. O. Wood, T.T. Winner in 1913 on a Scott Two-stroke.

THE popularity of the two-stroke machine has decreased considerably during the past few years, mainly owing to its absence from the ranks of machines used for war purposes, the chief reason being insufficient power. It is probable that the future will give us machines powerful enough even for the most exacting.

To multiply its supporters the two-stroke must compare favourably with the four-stroke on the following points: Reliability, prolonged efficiency, simplicity, accessibility, handiness, balance, acceleration, flexibility, cheapness, and consumption.

It will be generally admitted that the best two-strokes do compare favourably with and even excel four-strokes in some respects, excepting in fuel economy.

Manufacturers in the past have not given this item sufficient consideration, but no doubt they will now turn their attention in this direction.

From Mr. C. G. Pullin, Holder of the Senior Tourist Trophy.

IN my opinion, post-war plans of the majority of engineering firms had not properly matured at the signing of the Armistice, and it will be well into the summer months before the large production schemes, now possible with the present machine tool equipment and factory extensions, get into full swing. Labour should present no difficulty, wages are likely to be high, and also raw materials; but on a substantial output and correct design these should not stand in the way of a good, reliable, and cheap machine.

The greatest question, to my mind, that is not yet settled, is the design. I have recently inspected numerous drawings of machines now in the course of construction, but although being brimful of novelties and fitted with super-efficient engines, all tend towards complication. The man in the street must have simplicity.

I expect to see great developments in two-stroke designs, and if only designers will throw off the cloak of convention and realise that a two-stroke, three-port engine can be equipped with additional valves and made to operate economically without complications, a huge field awaits their product.

Turning to gears, an infinitely variable gear of the hydraulic type is clearly indicated, splendid results now being obtained from comparatively small units, but some time will elapse before these can be produced to meet the requirements of motor cyclists. In the meantime, the best compromise seems to be the epicyclic type, all gears being in mesh and fool-proof in operation.

The finality in frame design has yet to be reached, but pressed steel construction is likely to come forward.

From Mr. Laurence H. Cade, the London Motor Cyclist-Journalist.

THE future must inevitably be veiled in obscurity, but the veil is rosy-hued, tinted from the glow of what lies beyond. Nineteen-nineteen is an alliterative date, easy of remembrance, and it will be a year to remember. It will be the morning of time in the development of a new democracy of the road, for motor cycling will indubitably appeal to the masses as it has never done before.

There will be tens of thousands of initiates of both sexes, and they have to be taught: not taught to drive, but taught the potentialities and the limitations of the types. There will be a tendency, born of the magnificent war services of the motor cycle, to expect too much. We shall see mechanical Shetland ponies hauling pantechicon-like sidecars, unless—well, unless care is devoted to the education of the newcomers.

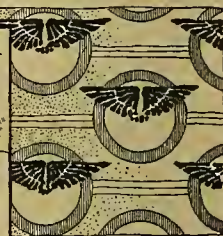
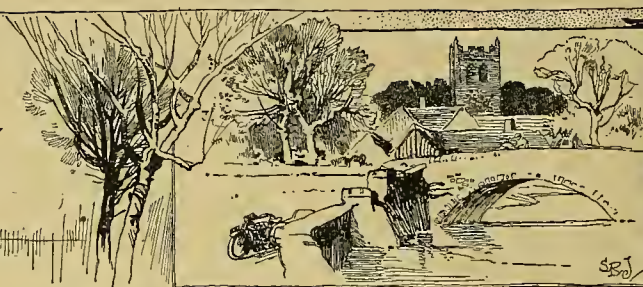
As an industry, a sport, and a pastime, there is a wonderful future ahead of us.



Mr. Laurence H. Cade.



GEARS AND THE POSSIBILITY OF GEARLESSNESS.



DESPITE the rapid development of gearing for motor cycles during recent years, and the fact that now good and reliable gears are obtainable, none the less we are still far from the ideal. The hub gear came, saw, and was conquered. Suitable for bicycles it was too small for the motor cycle, especially for sidecars, and so gradually became obsolete. The two-speed engine-shaft gear is more reliable, but, projecting as it does from the machine, it is apt to be damaged by a tumble, and as the ratio of reduction is usually about 35% it is unsuitable for heavy passenger work. Omitting a few special types, there are now three kinds of gear in general use—the variable pulley type, the selective chain type, and the countershaft gear box. The first-named, if, as in the Zenith and the Rudge, the belt tension is constant, is easy to manipulate, and fits the gear to the grade beautifully. Its disadvantages are that it involves direct belt drive, and does not give a very low bottom gear, if the top gear be sufficiently high. The countershaft Zenith overcomes these disadvantages, and permits the use of a long belt, but the fact that all variable gears, excepting friction drive, necessitate use of the belt lessens their popularity with many riders.

The Chain Transmission Types.

The selective chain types, like the Enfield, and P and M., are simple and efficient. Being only two-speeders, however, there must be plenty of engine power in hand. A $3\frac{1}{2}$ h.p. with a sidecar needs three ratios, unless one is prepared to do a lot of low gear climbing. With a 6 h.p. engine, however, in good tune, there are few main road hills that cannot be taken on top, and selective gears are delightful easy to manipulate in traffic.

The countershaft three-speed gear box is undoubtedly the most popular type. Its disadvantages are weight and, sometimes, inaccessibility. It needs careful use, and the continual declutching and sometimes double clutching involved are more troublesome on a motor cycle than on a car, since the air-cooled engine is less flexible, and the throttle must be adjusted every time if the engine is not to race or stop. Moreover, the driver has to be more careful than ever with this type of gear in proportioning engine and wheel speeds to each other. To add a fourth speed gives further advantage, but at the expense of increasing the complications of manufacture and the weight.

The writer has owned machines of every type mentioned; and, being in London and continually driving in traffic, prefers his present mount—a 6 h.p. Enfield combination—for that reason. Geared 5 to 1 on top, it is capable of 10 to 50 m.p.h. on that ratio.

At really high speeds it does seem under-geared, but after all 30-50 is a speed one seldom wishes to exceed with a sidecar on war-worn roads, and the 6 h.p. engine geared 5 to 1 is beautifully flexible, and fast enough for all practical purposes. Only for starting and traffic crawling does the writer need his second speed; he has therefore the nearest possible approach to a gearless mount. Except for speed men, pure and simple, a high top ratio is a mistake. Any increase of speed on the level is discounted by the inability to climb much on top gear. The lower ratio will probably be as fast or faster on a cross-country up and down trip, as well as being much more flexible. It is worth sacrificing extreme speed capabilities to get a better all-purpose mount.

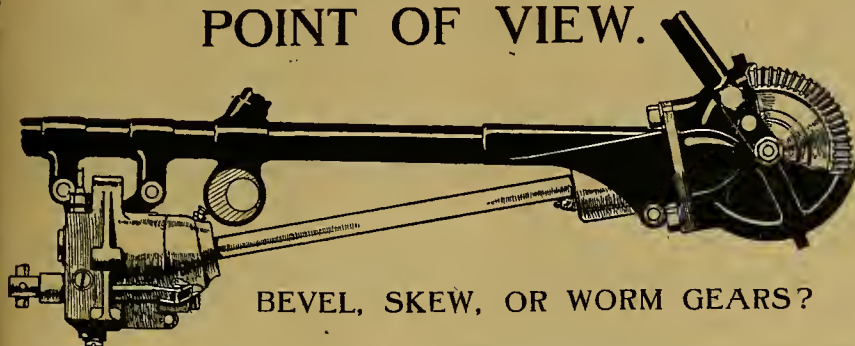
Hydraulic Transmission.

The question still remains, however whether it is possible to produce a gearless passenger mount. There are three ways in which the problem may be solved—by steam, by an auxiliary electric motor, and by a revolutionary system of transmission, such as by hydraulic pressure.

The first two are already familiar to Londoners in the National steam 'buses and Tilling's fleet of petrol-electric vehicles. Both surmount stiffish hills, though a trifle more slowly than geared vehicles. Steam is still in the experimental stages so far as motor cycles are concerned, but it seems to have a future, especially in commercial sidecar outfits, where high speed is not required. The auxiliary electric motor adds weight, which might prove too much for a motor cycle; and so far as one can see at present, both types are more suitable for heavy than for light vehicles when speed is more a requisite than power. The third possibility is still in the air, but one may ask whether we must always be tied to the present form of transmission. Is there any mechanical impossibility in transmitting power from cylinder to wheel by hydraulic tubes? It is true that there are a number of practical difficulties, but they are not of such a nature that they can never be overcome. If some inventive benefactor can work his way through them, we should have a transmission like the motor of an electric train, and gears would be unnecessary. Instead of having a form of transmission by which the wheel slows the engine, and gears must be interposed to allow the engine to run fast whilst the wheel turns slowly, we should have a perfectly flexible means of transmission, when all that would be needed would be more throttle opening for the increase of power. The experiences of the last four years have done much towards perfecting the petrol engine. But the ideal transmission still remains to be found.

JULIUS.

SHAFT DRIVE FROM AN ENGINEER'S POINT OF VIEW.



BEVEL, SKEW, OR WORM GEARS?

AN interesting point regarding the question of drive is opened up by the advent of the four-cylinder-in-line engine similar to car practice, and similarly set in the frame. Now up to the present most makers of this type of machine have fitted some form of shaft drive, the exceptions being the friction drive types, which, on account of the right-angled primary drive, are most suitable for a chain final drive; but if we consider that the adoption of a shaft drive entails at least two sets of gears to transfer the line of drive from the central crankshaft to the outside of the road wheel, it will be seen that the question of comparative efficiencies lies between the pair of spur wheels with the shaft bearings and universals and the chain.

As the general run of motor cycles were, and have been since the inception of that means of locomotion, driven by means of belts and sometimes chains, the idea of the more rigid type of drive was, and to a certain extent still is, looked upon as an unnecessary "refinement" and savouring too much of a slavish copying of car practice.

A Pioneer.

One well-known shaft machine, though not English, dating from about 1906, did much pioneer work for the shaft drive devotees. I refer to the four-cylinder F.N., which was really years before its time in many respects. The T.A.C. of about the same date introduced the worm

drive on motor cycles, but as these machines were not built on "sporting" lines they did not succeed as they should have done, principally, of course, because the motor cyclist of their day was culled from the ranks of sportsmen, and the potentialities of the motor cycle purely as a means of transport—of both men and goods—had not penetrated the public's collective skull. Anyway, it was solely in connection with four-cylinder engines that the shaft drive was associated, and the present-day tendency to a big increase in the number of four-cylinder machines on the market should do much to show whether the shaft drive is a desirable proposition generally from the motor cyclist's point of view.

It must not be overlooked, however, that the shaft drive may be applied in a variety of ways. The final gearing may be one of three—worm (either underslung or overhead), bevel, or skew. Any of these will provide a neat looking unit, but the relative efficiencies differ with the circumstances and conditions under which they are employed.

The Longitudinal Engine.

The principal problem, of course, with engines set longitudinally in the frame is to transfer the motion in a parallel direction some distance to one side of the crankshaft. In some cases the first step towards this is effected by the use of spur gears, or bevels, the choice of final drive lying between the shaft and the chain.

The skew gear up to the present has not been used for the final drive and is intended solely for use in positions where the axes of the driving and driven shafts are not at right angles. It may be possible, therefore, to continue the drive to the rear wheel by inclining the shaft to one side and employing skew gears instead of universals and worms.

A very important point to consider in all cases where shaft drive is used is the necessity of employing a universal joint at each end of the shaft to allow for the misalignment during riding, but in these cases their action is only incidental and occasional and does not lower the efficiency of the drive to any great extent, the shaft in the main being in line.

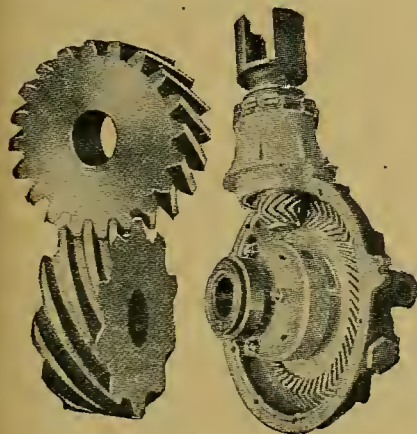
It is also required to have the gear wheel amply supported on both sides so that the liability of "whip" in the shaft shall be reduced to a minimum, and a thinner shaft can be employed; also that the meshing of the gears shall be constant, as the greatest source of noise in gears

is the variation in peripheral speed. The liability of speed variation should also be combated by incorporating in the drive some form of cushioning arrangement similar to that provided in the case of chains. Further, allowances must be made for the reversing and over-running of the machine.

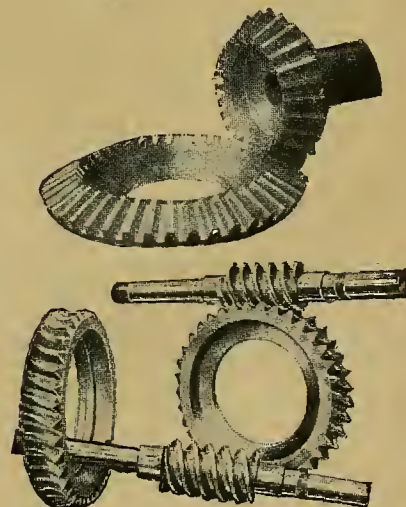
The advantages of the worm are its high efficiency at moderately high speeds—indeed, the higher the speed, up to a certain point, the less the friction and the higher the efficiency—this is possibly due to the better lubricating effect. In all cases the worms should be run in oil baths. Both worm and skew gears are fairly expensive to install—that is, to make a high-class job, but when once properly mounted, with adequate lubrication they are very quiet and retain their good qualities a long time.

Comparison of the Types.

Bevel gears have the advantage of being more easily cut and fitted, but they are noisier than the former two types of gear, and lose their efficiency more rapidly. I have not heard of helical bevels being used on motor cycles, but they are essentially smoother in action and stronger than the plain bevel, and a smaller minimum number of teeth can be safely used. The efficiencies of the worm and skew do not differ greatly, but, if anything, are in favour of the worm; but, as has been seen, with the gear box incorporated, an additional loss is sustained by the introduction of an internal right-angle gear—generally a bevel—so that if a skew gear can be used it will do away with this gear and effect a corresponding saving in power losses, though perhaps slightly modified by the interposition of the two universal joints. As regards the merits of the bevel as against the worm, the bevel has little to recommend it except cheapness of first cost, which personally I consider out of all proportion to the satisfaction obtained from the additional silence, efficiency, and long wearing qualities of the more expensive and better job provided by the installation of a worm gear. MASCOT.



(Left) A pair of spiral gear wheels.
(Right) Helical bevel drive adapted for use on cars.



(Top) Bevel gearing, as used on F.N. motor cycles. (Bottom) Plain worm drive.

PLUG INSULATION.

A PLUG of novel construction has now been fully proved and tested by the Robinhood Engineering Works, Newlands, Putney Vale, S.W.15. The outside insulation of the plug is made from a material which, as far as known, has never before been used for the purpose. It is claimed to be far superior to porcelain, more elastic, non-hydroscopic, and is unaffected by change of temperature within the limit to which it will be subjected.

A SPRAYING JET.

A JET has been recently invented by Mr. W. Javes, Norton Villa, Osmaston Park Road, Derby, the idea of which is to cause the fuel to emerge from the jets in a fine, whirling spray.

As will be seen from the illustration, Mr. Javes's idea is to screw into a plain jet a loose plug, on the top of which are cut a number of helical grooves. Petrol passes through the centre of the plug, issues through the hole midway in its length, thence flowing into the channel provided, and issuing up the helical grooves. The jet is adjustable, and in a modified form is provided with a mushroom head, so that the degree of opening can be instantly altered, and (if necessary) the petrol can be shut off altogether. By this means a very small opening can be obtained, and the objection to a small opening—namely, that it may lend itself to stoppage by an obstruction—can be overcome by quickly opening the jet and again restoring it to its former position, such a procedure being practically certain to clear out any foreign matter.

In a further modification of the invention the area of the jet orifices can be varied either automatically or by hand. A demonstration of the device on a motor cycle would undoubtedly be interesting.

THE MOTOR FUEL PROBLEM.

DR. W. R. ORMANDY, in a paper read before the Institution of Petroleum Technologists, spoke of the growing uses of motor fuels, of fuels solid, gaseous, and liquid, and of substitutes for petrol. Among these are the coal tar distillates from coke ovens and from gas works; shale oil, of the comparatively large resources of this in Scotland, and of the immense deposits running from Norfolk down to Dorsetshire, which are practically untouched; alcohol, from molasses or the non-crystallisable residues from the manufacture of cane or beet-sugar, from starch, from potatoes, cellulose, and sulphite wood-pulp residues; also synthetic alcohol, processes for the production of which

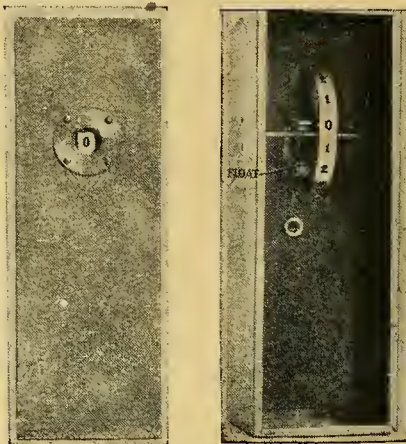
from ethylene and acetylene have been developed. Alcohol, however, cannot be used for the hundreds of thousands of existing motors without admixture of some sort. Motor-benzole mixes with alcohol in any proportion, and experiments have shown that one part of benzole mixed with two parts of alcohol can be employed in existing engines without any alteration whatever beyond arranging for the better heating of the air supply to the carburetter, and possibly a slightly larger jet. An engine provided with such an admixture runs more smoothly than if petrol were employed.

A NOVEL PETROL GAUGE.

AN ingenious and novel petrol gauge has recently been introduced by Simms Motor Units, Percy Buildings, Gresse Street, Rathbone Place, London, W.1. The device is clearly shown in our illustration, which demonstrates a motor cycle tank with the top removed.

It will be seen that the gauge takes the form of a wheel, inside the periphery of which is a triangular float. The wheel is supported on bearings inside the tank, and when the latter is empty the weight of the float naturally remains at the bottom, showing the figure 0, denoting that there is no petrol left. It will be seen that it is easy, therefore, to graduate the wheel in, say, quarts, so that the figure shown in the glass window on the top of the tank will denote the amount of petrol therein.

Since the device consists of only one glass portion, and that an adequately protected tiny window, its working is of the simplest possible description, and it is unlikely that it will give any trouble; but it must be borne in mind that the Simms motor cycle petrol gauge is an article which will not appeal directly to the user, as it cannot be fitted by an amateur, but to the manufacturer, as it must be built into the tank. Sold, however, as a complete fitment, it cannot fail to appeal to the practical motor cyclist.

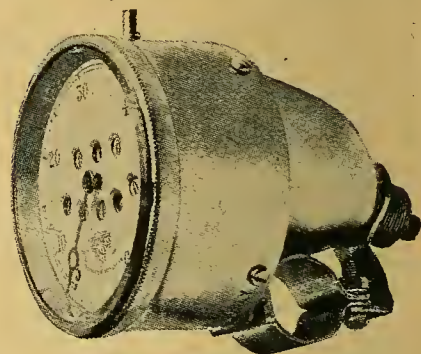


THE SIMMS PETROL GAUGE.

(Left) The window in the top of the tank through which the figures are clearly seen. (Right) The simple mechanism shown fitted to a tank with top removed.

THE 1919 SMITH MOTOR CYCLE SPEEDOMETER.

THE Smith speedometer has for a long time been popular among motor cyclists, and now that the war is over Messrs. S. Smith and Sons (Motor Accessories), Ltd., 179-185, Great Portland Street, London, W.1, are free to take up once more the manufacture of this excellent instrument. During the last four years the company has been busily engaged in the manufacture of instruments for aeroplane work, which has necessitated the greatest accuracy. It can therefore be surmised that the best possible work has been put into the Smith motor cycle speedometer, which is specially designed to stand hard wear.



The latest model Smith motor cycle speedometer.

RACING IN NEW ZEALAND.

A SPECIALITY of many of the motor cycle clubs of New Zealand is handicap racing on the seashore. As there is no Brooklands on which to test machines at high speeds, the hard flat expanses of sandy beach form an admirable race track for the many thoroughly sporting clubs which exist in New Zealand.

On Saturday, October 26th. at New Brighton Beach, Christchurch, N.Z., the Pioneer Motor and Sports Club held a race meeting. The results are as follows:

8 MILE NOVICE SIDECAR HANDICAP.

1. T. Tyson (7 Henderson) ... scr.
2. H. W. White (7 Harley-Davidson) ... 15s.

Time, 11m. 9s. = 43 m.p.h.

8 MILE NOVICE SOLO HANDICAP.

1. H. W. White (7 Harley-Davidson) ... 15s.
2. A. J. Nicoll (7 Indian) ... scr.
3. R. Brosnan (8 Bat) ... 50s.

Time, 10m. 38½s. = 45 m.p.h.

48 MILE OPEN SOLO HANDICAP.

1. R. Kennett (7 Harley-Davidson) ... 2m. 15s.
2. G. Moffet (7 Excelsior) ... 1m. 30s.
3. H. W. White (7 Harley-Davidson) ... 4m. 30s.

Time, 48m. 58s. = 58.8 m.p.h.

It will be noticed that American machines were to the fore, but, in justice to British makes, it must be explained that there are few, if any, new British machines to be had in New Zealand to-day.



MUD—

EVEN the Flanders variety couldn't stick up a **CAV** Magneto. Totally enclosed, it kept going—no matter what the conditions—Thousands have done and are now doing duty with the Forces at home and abroad

C.A.V. Magnetos

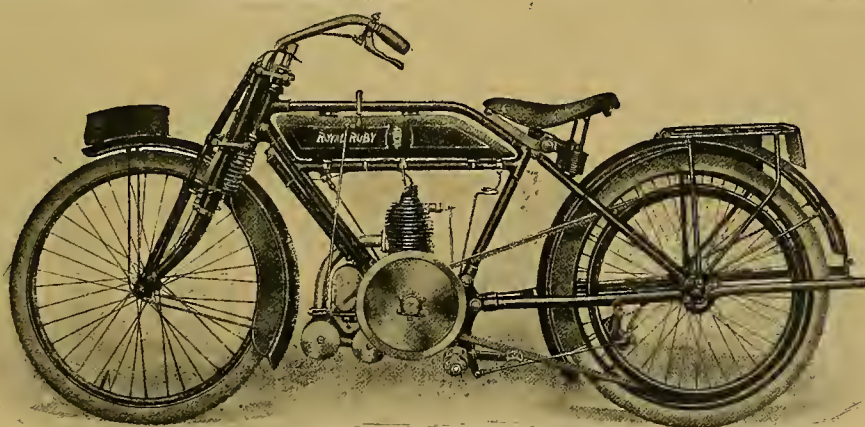
BRITISH THROUGHOUT

C. A. VANDERVELL & Co., LTD., ACTON, LONDON W. 3

We are members of the



ROYAL RUBY



2½ H.P. 2-STROKE LIGHTWEIGHT

We are producing only one Model 2-stroke Lightweight, viz.: Single-speed, but it will be the best.

SPECIFICATION.—Special Frame with Royal Ruby Patent Safety Stays. Villiers 2½ h.p. 2-stroke Engine. Dunlop Motorcyclette 26" x 2" B.E. Tyres. Dunlop Belt. Brooks Saddle. PRICE £40 NETT CASH.

Deliveries will commence in 3 to 4 weeks.

Place your order early to ensure one.

THE ROYAL RUBY CYCLE CO.,
CANNEL STREET, ANCOATS, MANCHESTER.

Telephones—City 3818—Central 1570.

Telegrams—"Machines, Manchester."



The G.N., originated by Godfrey and Nash over ten years ago, and since then the object of their undivided attention, is the successful outcome of their determination to evolve and perfect a light and comfortable two-seater of high performance and low first cost and upkeep.

Other types of two-seater, the motor cycle and sidecar, the miniature car, and the car-de-luxe, have their certain advantages, and yet fail to fulfil all the conditions.

We have the assurance to assert that the 1919 G.N., in its simplicity of design and sturdiness of construction, sacrifices no essential attributes; it embodies nothing experimental and nothing "microscopic."

An illustration and specification of the "Standard" model will appear in next week's issue; an advance catalogue, with terms, etc., will be posted on application.

G.N., Ltd., Etna Works,
Albert Road,
Hendon,
N.W.4.

Raymond.

DOUGLAS ALL-BLACK MODELS

We have had four years with DOUGLAS Motor Cycles under active service conditions. Our experience and advice are at your disposal. A few of the famous ALL-BLACK DOUGLAS for quick delivery. Guaranteed early delivery of a limited number of 1919 models.

A CUSTOMER WRITES:

11th January, 1919.

Gentlemen,

Thank you for your letter of the 9th inst. with Douglas booklet and petrol licence enclosed. I enclose herewith P.O. for 18/-, the amount paid by you to the Petrol Control Committee for tax on my licence. I note you have despatched the machine. I will let you know when I receive it.

Again thanking you,

Yours faithfully,

If you are interested in DOUGLAS machines call and see us. Always open.

VIVIAN HARDIE, Ltd.
(DOUGLAS SPECIALISTS),
24, WOODSTOCK ST. (off Oxford St.), BOND ST.,
LONDON, W.1.

Look for
the New
TRADE
MARK



REGD TRADE MARK

the Bow'd N as
shown above on
all the operating
parts of Bowden
Wire Mechanism.

The OLD
MARK

—commonly known as the "Bowden Loop of Wire"—has been mis-used abroad, and we have decided to discard it.

ONE OF THE MOST VALUABLE OF
TWENTIETH CENTURY INVENTIONS
IS THE

**BOWDEN
WIRE
MECHANISM**

It is known to millions of motorists and motor cyclists the world over. It is seen now on thousands of cameras, and in a multitude of other applications. War evolved many fresh uses for this remarkable invention. The original brands of the wire are known under the Trade Names (registered as Trade Marks in most civilised countries).

**BOWDENITE, BOWDENBRASS,
BOWDENOIR, BOWDENSILVER,
BOWDENSILVER.**

MANUFACTURERS & PATENTEES

**Bowden
Wire Ltd.**

LONDON

WILLES IN JUNCTION
N.W.1

And at
New York,
U.S.A.

Established
1897.

Godbolds.

Current Chat



Times to Light Lamps.

GREENWICH TIME.			
Jan. 23rd	...	5.0	p.m.
" 25th	...	5.4	"
" 27th	...	5.8	"
" 29th	...	5.11	"

Motor Cycle Police in Canada.

We learn that Montreal has now the largest number of motor cycle police of any town in Canada.

Preparing.

One well-known maker has already sent a squad of competition riders round the last Six Days course on a batch of post-war machines.

Nottingham and District M.C.C.

A committee meeting of the Nottingham and District M.C.C. will be held at headquarters, the Welbeck Hotel, on February 14th, at 7.30 p.m. A most comprehensive programme has been drawn up, and it has been decided to pay more attention to the social side than has been done in the past.

Magneto Exhibition.

An interesting working exhibit of British magnetos has been made by members of the British Ignition Apparatus Association at the Exhibition of British Science Products during the past fortnight at the School of Technology, Sackville Street, Manchester, providing striking evidence of the remarkable development of the British magneto industry.

The Industrial Reconstruction Council.

A conference on "The Workers' Interest in Costing: A Factor of Industrial Reconstruction," will be held under the auspices of the Industrial Reconstruction Council on Tuesday, January 28th, at 6 p.m., in the Hall of the Institute of Journalists, 2 and 4, Tudor Street, E.C.4. The chair will be taken by Mr. Jack Joseph, of Messrs. J. Lyons and Co., Ltd., and the opening address given by Mr. M. Webster Jenkinson, C.B.E., F.C.A., Controller of Factory Audit and Costs at the Ministry of Munitions. Questions and discussion will follow. No tickets are necessary.

Second-hand Prices.

We give below a complete list of the average prices of second-hand machines as advertised in the previous issue of *The Motor Cycle*:

	Previous to 1914.	1914.	1915 and 1916.	1917 and 1918.
A.J.S., 2½ h.p.	—	£37	—	—
A.J.S., 6 b.p.	—	£73	£90	—
A.J.S., 4 h.p.	—	—	£68	—
Alder, 2½ h.p., 2-stroke	—	—	£25	—
Alldays Allon, 2½ h.p., 2-str.	—	—	£33	£41
Alldays Matchless, 2½ h.p., 2-s.	—	£18	—	—
Alldays, 8 h.p., sidecar	—	£80	—	—
Ariel, 4 h.p.	—	£18	—	—
Ariel, 3½ h.p., sidecar	—	£38	£45	£73
Bat, 5-6 h.p., sidecar	—	£60	£50	—
Bat, 8 h.p., sidecar	—	—	£45	—
Bradbury, 4 h.p., sidecar	—	£25	—	—
B.S.A., 3½ h.p., sidecar	—	—	£65	£76
B.S.A., 3½ h.p.	—	£30	—	£65
Calthorpe-Jap, 2½ h.p.	—	—	—	£30
Chater-Lea, 8 h.p., sidecar	—	—	£68	—
Douglas, 2½ h.p.	—	£35	£36	£52
Douglas, 4 h.p., sidecar	—	—	—	£49
Elswick, 3½ h.p., sidecar	—	—	—	£65
Enfield, 2½ h.p., 2-stroke	—	—	£49	—
Enfield, 3 h.p.	—	—	£14	£42
Enfield, 6 h.p., sidecar	—	£28	—	£50
Enfield, 8 h.p., sidecar	—	—	£57	£79
Enfield, 8 h.p.	—	—	—	£110
Excelsior, 2½ h.p., 2-stroke	—	—	£30	—
Harley-Davidson 7-9 h.p., s.c.	—	—	£95	—
Hazlewood, 5-6 h.p., sidecar	—	—	£55	—
Hobart, 2½ h.p., 2-stroke	—	—	£16	—
Humber, 3½ h.p., sidecar	—	£36	£30	—
Indian, 7-9 h.p.	—	—	£35	£70
Indian 7-9 h.p., sidecar	—	—	—	£75
James, 3½ h.p.	—	—	—	£60
James, 4½ h.p., sidecar	—	—	£55	—
Levis, 2½ h.p.	—	—	£22	£30
Levis, 2½ h.p.	—	£34	—	—
Matchless, 8 h.p., sidecar	—	—	—	£130
Matchless, 6 h.p., sidecar	—	£35	—	—
New Hudson, 2½ h.p.	—	—	£28	—
New Hudson, 3½ h.p., sidecar	—	—	—	£68
New Hudson, 6 h.p., sidecar	—	—	£60	—
New Ryder, 2½ h.p.	—	—	£35	—
O.K., 2½ h.p.	—	—	£25	£37
P. & M., 3½ h.p., sidecar	—	£46	—	—
Premier, 7-9 h.p., sidecar	—	—	£70	—
Premier, 3½ h.p.	—	—	£65	—
Quadrant, 8-9 h.p.	—	£58	—	—
Radco, 2½ h.p., 2-stroke	—	—	£18	—
Rex, 2½ h.p.	—	£15	—	—
Rex, 3½ h.p., sidecar	—	—	£46	—
Rover, 3½ h.p.	—	£24	—	£85
Rover, 3½ h.p., sidecar	—	—	£35	—
Rudge, 3½ h.p., sidecar	—	—	—	£75
Rudge, 3½ h.p.	—	—	£58	£68
Rudge, 3½ h.p.	—	£22	£28	£50
Sparkbrook, 2½ h.p., 2-stroke	—	—	—	£31
Sun-Vitesse, 2½ h.p.	—	—	—	£32
Sun-Jap, 6 h.p., sidecar	—	—	—	£27
Sunbeam, 3½ h.p., sidecar	—	—	—	£90
Sunbeam, 6 h.p., sidecar	—	—	—	£105
Sunbeam, 3½ h.p.	—	—	—	£68
Sunbeam, 8 h.p., sidecar	—	—	£75	£120
Triumph 3½ h.p.	—	£22	—	—
Triumph, 4 h.p., sidecar	—	£33	—	—
Williamson, 8 h.p.	—	£55	£41	£75
Wolf-Jap, 2½ h.p.	—	£19	—	—
Zenith, 8 h.p., sidecar	—	—	—	£100
Zenith, 5-6 h.p., sidecar	—	—	—	£75

Special Features.

OUR FIRST JOY RIDE.

SHAFT DRIVE.

GEARS, AND THE POSSIBILITY OF GEARLESSNESS.

No Petrol Permits in India.

The rationing of petrol was discontinued on December 1st in India. This decision was brought about because a regular supply of petrol was expected and there is a considerable stock accumulated in Bombay.

No Sunbeams until May.

Although Messrs. John Marstons, Ltd., were released temporarily from their French military contracts, these have been renewed, which will prevent any Sunbeam motor cycles from being placed on the open market until May next.

Petroleum in Alsace.

Before the conclusion of hostilities the German Petroleum Co. had considerable success in Alsace. A number of wells were sunk, and increased production was anticipated. These oil wells are, of course, now in the hands of our French Allies.

Road Reports.

It is naturally evident that it will take a long time to restore the roads of Great Britain to their pre-war condition of excellence. A good deal has been written on this subject in *The Motor Cycle*, and it is clear that every effort will be made to repair the roads, make new ones, and generally improve the highways throughout the United Kingdom. All this, however, will take time, and for some period ahead there will be stretches of main road in very bad condition which motor cyclists would like to avoid.

We should be pleased to hear from readers in various parts of the country—and we know our readers cover the whole of the British Isles—informing us of any particularly bad stretches in the districts in which they reside, and also any information which would enable motor cyclists who are passing through to avoid them. It is only by co-operating in this manner that motor cyclists can assist one another and get the maximum amount of enjoyment from the pastime.

Returned from Austria.

Basil Vickers-Jones, once famous as a T.T. rider and hill-climbing expert, has returned to England from Austria, where he has been interned since the commencement of the war. When hostilities broke out, Vickers-Jones held an important position in the Eger (Bohemia) works of the Coventry Premier Company.

War-worn Motor Cycles.

At the time of going to press, we received advice that "hundreds of motor cycles" were arriving at Grove Park. It is said that this is the result of the evacuation of Kempton Park, where, as reported in our illustrated article last week, many hundreds of machines of all makes have been parked pending their disposal. We are told that a quantity of these machines (mostly in crates) can be seen from the road, and that they include a large number which have been overhauled by the Army mechanics, and are in good running order.

A Motor Cyclist Aero Engine Designer.

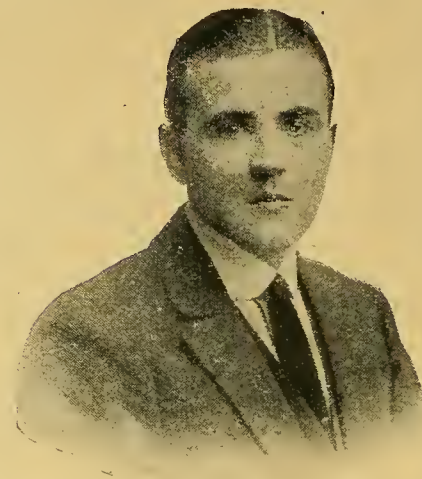
At various times we have given instances of the benefits which the nation has obtained—particularly during the war—as the result of a really close study of motor cycle engine design. It would be interesting, for instance, to know to what extent motor cyclists have contributed to British supremacy in the air. It is known that at least two of the most successful types of air-cooled engines were entirely the product of motor cyclists; and in other designs it is within our knowledge that motor cyclists played a live part.

One of the most successful aero engines of the war was the BR2 nine-cylinder rotary engine designed by Capt. W. O. Bentley, M.B.E., R.A.F., who is one of the three brothers who interested themselves in long-distance records and T.T. Races, in the capacity of amateurs. Capt. W. O. Bentley, whose portrait is reproduced, and who was lately awarded the M.B.E. as the result of his war work, will be recalled as a T.T. rider of no mean repute. The older school of motor cyclist will recollect the name of Bentley in connection with End-to-end records, and it was Capt. Bentley's brother, A. W., who broke the record in 1908, riding a Triumph motor cycle.

In 1909, Capt. Bentley, as a private owner, rode a $3\frac{1}{2}$ h.p. Rex in the T.T. Race. In the following year his mount was a 5 h.p. Indian, but he was again unlucky, a burst rear tyre on Greg Willey's Hill putting him out of the running during the first lap. He subsequently became a partner in the firm handling the D.F.P. car—a French production of very modern design. Prior to the design of the 250 h.p. BR2 engine, Capt. Bentley—at that time a lieutenant in the R.N.V.R.—produced the 150 h.p. BR1 engine. The two engines in general principles are very much the same, having cylinders made up of steel liners surrounded by an aluminium alloy jacket shrunk on, and steel heads.

The Carbide Order, 1917.

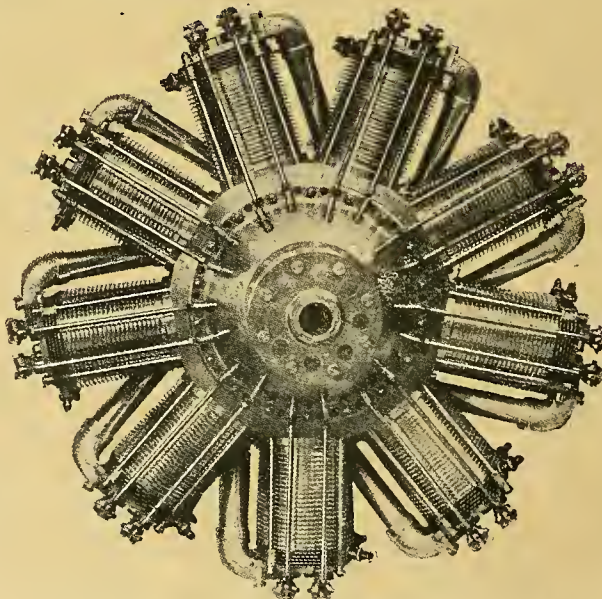
Further to the Ministry of Munitions press notice of November 25th, 1918, regarding the restrictions on prices and the movement of carbide, the prices have now been fixed at £30 per ton for lump and £30 10s. per ton for the granulated of 16 to 25 mm. in quantities exceeding 110 lb.



Capt. W. O. Bentley, M.B.E., R.A.F.

THE DISPOSAL OF ARMY MOTOR CYCLES.

Up to the time of going to press, the authorities had not published a definite scheme for the disposal of the bulk of ex-army motor cycles. Forty motor cycles were to be offered for sale by auction yesterday, the 22nd inst., at Messrs. Aldridges, St. Martin's Lane, London.



The BR2 250 h.p. rotary engine designed by Capt. W. O. Bentley, M.B.E. Its forerunner was the 150 h.p. AR1, later known as BR1. This engine was well known in the Service, and has done splendid work.

War Tax Rescinded.

The American war tax of 3% is no longer applicable to the export of motor cycles from the U.S.A. to Canada. This makes a reduction in price amounting to from fifteen to twenty dollars.

Aluminium.

The price of the Government stock of 98-99% ingot is now £150 per ton. The stock will be gradually released so as not to interfere with and disturb the aluminium industry.

Sale of War-worn Cars.

The second-hand motor trade were the chief bidders at the sale of surplus Government cars held at Aldridges, St. Martin's Lane, last week. Very high prices were realised, an old six-cylinder Sunbeam fetching as much as £425 5s. If these prices are any indication as to those at which the Army motor cycles will be sold later on, there appears little hope for the bargain hunters picking up a rideable machine for an old song.

Brooklands.

It is expected that Brooklands will be handed over to the B.A.R.C. by the Air Ministry shortly, but nothing definite or official is at present known. The Brooklands authorities are to settle with the Government regarding necessary repairs to the track with a view to putting it in order at the earliest possible moment. Col. Lindsay Lloyd says he hopes to have the track ready for the summer meetings, and may be in a position to make a definite statement shortly.

The Control of the Roads.

The Royal Automobile Club has established a Parliamentary Committee to consider legislation affecting roads and road transport, with power to act when it is considered desirable. The Club is strongly of opinion that the control of the roads should remain separate and distinct from the control of other means of communication, as heretofore, as it considers that any fusion of such interests, which would necessarily be more or less conflicting, might handicap the development of mechanical traction on the roads.

Programme of the Dublin M.C.C.

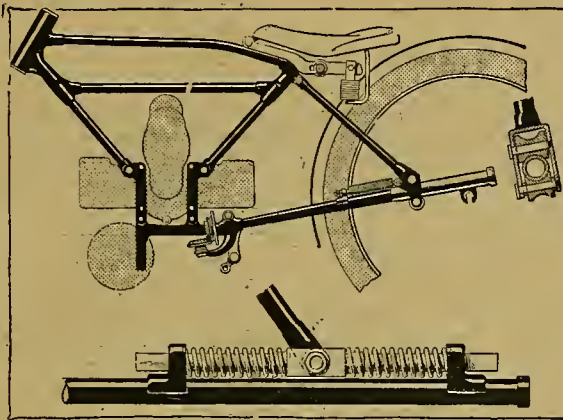
The Dublin and District Motor Cycle Club, whose operations for some time past have been suspended owing to the war, is putting its affairs on a business footing, and at a general meeting last week elected officers for the coming year. Those who served the club well in the past were re-elected, Mr. W. H. Freeman again holding the office of hon. secretary. The question of a competitive programme was discussed at some length, and it was decided to hold four road events during the coming season as under: A reliability trial for the Dunlop Cup on Easter Monday, a reliability trial on Whit-Monday, a twenty-four hours' reliability trial at the end of June, and a two days reliability trial on the Saturday and Monday of the August Bank Holiday.

A NEW SPRING FRAME.

A Neat and Novel Device for Gradua Gear Machines.

THE patent files frequently reveal activities in the designing departments of motor cycle manufacturers of which the public know little. Sometimes the publication of a patent specification by the Patent Office is the first and last intimation of certain experiments or ideas. On the other hand, such specifications in some cases herald the advent of a new model. Whichever of these two may be the case in the present instance, a spring frame embodying the Zenith-Gradua gear and a flat twin engine by Mr. Fred W. Barnes are of more than ordinary interest.

It is fairly obvious on examination that the design is more than a diagrammatic drawing such as forms part of the average patent specification, and this strengthens the impression that the flat twin



A spring frame designed for Gradua gear machines. The patent is by Mr. F. W. Barnes, of Zenith fame.

engine is included for a purpose, and not merely to indicate the position of an engine of any type. The countershaft drive, too, is suggested. However, the subject of the patent is the spring frame.

The main part of the frame is a rigid structure. To this is connected a linked wheel frame comprising the bottom tubes and the back stays. The lower ends of the back stays carry bifurcated brackets, which straddle over the bottom tubes and support each a pair of rollers which respectively engage the upper and lower sides of the bottom tubes. These rollers are grooved to prevent lateral displacement.

Coiled tension springs are attached at one end to the brackets, and at the other end are connected adjustably to lugs on the bottom tubes.

THE BUYERS' GUIDE.

Current Prices and Delivery Dates for 1919 Motor Cycles.

Make.	H.P.	Particulars in Brief.	Price.	Delivery.	Make.	H.P.	Particulars in Brief.	Price.	Delivery.
A.B.C.	5	Spring frame.	£ 70 0 0	May.	LEVIN	2½	2-stroke, single gear	£ 33 0 0	January. Out-put booked until end of March.
A.J.S.	3	Twin, 3-speed.	106 1 0	End o. January.	L.M.C.	3½	3-sp. countershaft gear.	73 0 0	} Delivery at end of January.
A.J.S.	6	Sidecar combination.	1-2 16 0	} January.	L.M.C.	4½	Ditto.	75 0 0	
ALLON	2½	2-stroke, 2-speed, clutch	55 0 0		L.M.C.	6	Twin ditto.	86 10 0	
ALLON	2½	2-stroke, 2-speed, clutch and kick-starter.	65 0 0	} January.	MATCHLESS	8	Combination.	140 0 0	} January. End of January
ARIEL	3½	3-speed.	80 0 0		METRO-TYLER	2½	2-stroke. 2-speed.	45 0 0	
ARIEL	3½	Sidecar combination	106 0 0	—	MORGAN	8	M.A.G. engine.	132 12 0	} Delivery commenced. Entire output for 1919 booked by various agents.
BLACKBURN	2½	4-stroke, 2-speed, clutch.	60 0 0	—	MORGAN	8	G.P., J.A.P. engine	143 17 0	
BLACKBURN	4	3-speed.	82 0 0	—	MORGAN	8	De luxe, M.A.G. (w.-c. J.A.P., £8 ss. extra).	143 17 0	
BLACKBURN	8	Combination.	125 0 0	—	NEW IMPERIAL	2½	J.A.P. engine, 2-speed.	50 8 0	} Delivery commenced.
BRADBURY	2½	4-stroke, 350 c.c., 2-sp.	63 0 0	—	NEW IMPERIAL	2½	J.A.P. engine, 2-speed, clutch.	58 16 0	
BRADBURY	4	Single, 3-speed, chain.	82 0 0	—	NORTON	8	Combination.	126 0 0	} Delivery commenced.
BRADBURY	6	Twin, 3-speed, chain.	100 0 0	—	NORTON	4	All-chain drive.	87 0 0	
BRITISH EXCELSIOR	2½	2-stroke, 3-speed countershaft, and kick-starter.	62 0 0	April.	NORTON	3½	T.T. countershaft, all-chain.	85 0 0	} Delivery shortly
BRITISH EXCELSIOR	2½	2-stroke, 2-speed.	56 0 0	March.	NORTON	3½	Single gear, B.R.S. engine.	73 0 0	
B.S.A.	4½	All-chain drive.	81 15 0	} Delivery commenced. Orders carried out in rotation as far as possible.	NORTON	3½	Ditto, with B.S. engine. Standard, T.T., all belt.	80 0 0	} Delivery shortly
B.S.A.	4½	Chain-cum-belt.	79 16 0		P. & M.	3½	R.A.F. model.	78 0 0	
B.S.A.	—	Sidecar.	29 9 0		P. & M.	3½	Combination.	102 0 0	} A limited number during Jan
CALTHORPE	2½	J.A.P. engine, 2-speed.	52 0 0	} Delivery commenced.	RANCO	2½	2-stroke, single gear.	42 0 0	} Early in February. (approx.)
CALTHORPE	2½	2-stroke, 2-speed	50 0 0		ROYAL RUBY	6 or 8	Twin 3-speed.	105 0 0	
COVENTRY EAGLE	2½	2-stroke.	47 5 0		ROYAL RUBY	2½	2-stroke single gear.	40 0 0	} Three or four weeks.
COVENTRY EAGLE	2½	Ditto, 2-speed.	54 12 0	—	SPARKBROOK	2½	2-stroke, single-speed.	46 4 0	
COVENTRY EAGLE	2½	J.A.P.	47 5 0	—	SPARKBROOK	2½	2-stroke, 2-speed.	52 10 0	} Early in February. (approx.)
COVENTRY EAGLE	2½	Ditto, 2-speed.	54 12 0	—	SUNBEAM	3½	3-speed, all-chain.	—	
COVENTRY EAGLE	3½	S.-A. c/sbaft, 3-speed.	82 19 0	—	SUNBEAM	2	Sidecar combination	—	
DOT	8	Combination.	135 0 0	—	SUN-VITESSE	2½	2-stroke, single-speed.	40 0 0	} April. (approx.)
DOT	3	Twin, 2-speed	65 0 0	—	SUN-VITESSE	2½	2-stroke, 2-speed.	52 0 0	
DOT	2½	Twin, 2-speed.	55 0 0	—	TRIUMPH	1	W.D. Model.	87 0 0	} Deliveries to agents commenced.
DOUGLAS	2½	W.D. Model.	60 0 0	} Delivery commenced.	TRIUMPH	2½	2-stroke, 2-speed	54 0 0	
DOUGLAS	4	W.D. Model.	75 0 0		VELOCETTE	2½	2-stroke, 2-speed.	40 0 0	} Delivery in a few weeks.
DOUGLAS	4	Combination.	95 0 0		VELOCETTE	2½	2-str., 2-sp., ladies mod.	42 0 0	
ENFIELD	2½	2-stroke, 2-speed chain-drive.	52 10 0	} It is hoped to commence delivery in January	WOOLER	2½	2-stroke, variable gear.	61 19 0	} April
ENFIELD	3	4-stroke, twin, 2-speed.	69 6 0		WOOLER	2½	Flat twin, 4-stroke.	61 19 0	
ENFIELD	6	Combination.	115 10 0						
ENFIELD	8	Combination.	117 12 0	—					
G.N. CYCLE CAR	10	2-cyl. Standard model.	140 0 0	} Early in April.					
G.N. CYCLE CAR	10	2-cyl. Vitesse model.	170 0 0						
HUMBER	3½	Flat twin, 3-speed.	85 0 0	Shortly.					
JAMES	4½	No. 6, single, 3-speed.	89 5 0	} Delivery commenced.					
JAMES	4½	No. 6, with sidecar.	115 15 0						
JAMES	3½	No. 7, V twin, 3-speed.	89 5 0						
JAMES	2½	No. 8, 2-stroke, 2-speed.	54 12 0						
JAMES	5-6	No. 9, twin, 3-speed.	99 15 0						
JAMES	5-6	Combination.	126 0 0						

Chain, Belt, Combination or Shaft?

The Voting on Transmission Systems in the "Which Type" Referendum.
The Fourth Article on Readers' Ideals.

WHICH TYPE?

An invitation to readers was issued in "The Motor Cycle" for November 21st and 28th, to send us the specification of their ideal machine. This referendum represents the opinions of thousands of thinking motor cyclists, and has revealed the proportionate popularity of various engine sizes, types and features in general. Previous articles on this subject have appeared as under: "The Ideal Solo and Sidecar Machines, embodying the Features Most Popular with the Majority," January 2nd. "Engine Types and Sizes," January 9th. "Engine Equipment," January 16th.

THE importance of the transmission question is second to none, therefore the proportionate popularity of the four systems in vogue should provide manufacturers with data of great value to them.

For some time design has tended towards all chain drive, and therefore it will not come as a surprise to readers to learn that the chain led its three rival systems by a very considerable margin.

On the other hand, it is perhaps curious that while in the solo class the four-speed gear box secured the largest number of votes, three speeds were generally considered to be the more suitable for passenger work. The popularity of the infinitely variable gear (such as the Rudge and Zenith) also is clearly indicated in the solo group. The following figures show the proportionate popularity of the various transmission systems for solo machines:

TRANSMISSION FOR SOLO MACHINES.*

Percentage.	From Engine to Gear.	From Gear to Road Wheel.	Percentage.
6.8 ..	Belt	Belt ..	6.8
73.3 ..	Chain	{ Belt. .. 26.2 Chain. .. 47.1	
14.5 ..	Shaft	{ Belt. .. 2.1 Chain. .. 0.6 Shaft. .. 11.8	
5.4 ..	Gears	{ Belt. .. 3.2 Chain. .. 0.8 Shaft. .. 1.4	

It will be seen that all-shaft drive and the gearshaft system together score 13.2%. Incidentally, it should be noted that probably all those who specified all-shaft transmission overlooked that the drive cannot be taken directly from engine to road as on a car, owing to the rear wheel being on the shaft line of the engine; and therefore had in mind the same system as specified by 1.4% only, i.e., gears and shaft.

It is apparent that even for solo work the chain is regarded as the ideal transmission by the majority, while in the sidecar class it shared with the shaft 75% of the total.

SIDECAR TRANSMISSIONS.*

Percentage.	From Engine to Gear.	From Gear to Road Wheel.	Percentage.
1.2 ..	Belt	Belt ..	1.2
66.9 ..	Chain	{ Belt. .. 12.6 Chain. .. 54.3	
25.7 ..	Shaft	{ Belt. .. 0.5 Chain. .. 5.1 Shaft. .. 20.1	
6.2 ..	Gears	{ Belt. .. 1.2 Chain. .. 3.6 Shaft. .. 1.4	

*Excluding infinitely variable gears.

In considering the number of gear ratios; it is at first sight surprising to find that while in the solo class the four-speed gear box found greater favour than the three-speed type, in the sidecar group the three-speed box took first place. This fact appears to indicate that the extra-ratio is regarded as a "top-speed luxury" for favourable conditions. The reason why this desire for such a ratio is more apparent with solo riders probably is due to the fact that the majority of solo enthusiasts specified an engine with a greater reserve of power for ordinary purposes than in the sidecar class.

Further Conclusions.

To facilitate a study of this question we give below figures taken from our review of engine sizes which appeared in the issue for January 9th.

SOLO ENGINES.

Under 500 c.c.	10.3%
500 to 600 c.c.	70.8%
700 c.c. and over	18.9%
	89.7%

SIDECAR ENGINES.

750 c.c. and under	48.6%
Over 750 c.c.	51.4%

In judging these figures it is assumed that sidecars with engines under 750 c.c. capacity have not a sufficient reserve of power to propel an outfit on an abnormally high gear, whereas such reserve exists with a solo machine having an engine of 500 c.c. and over.

The voting on gear ratios was as follows:

	Solo.	Sidecar.
One speed	2.1% ..	1.8%
Two speeds	10.4% ..	2.5%
Three speeds	25.1% ..	48.9%
Four speeds	41.6% ..	39.2%
Infinitely variable	20.8% ..	7.6%

It will be seen that by 20.8% of the solo voters the infinitely variable gear is considered to be ideal. These specifications slightly increase the all-belt drive figures and those representing chain-cum-belt. Taking the infinitely variable gears separately we have the following figures in the solo class:

*All-belt drive	39.6%
†Chain-cum-belt	48.9%
Friction drive	1.3%
‡Hydraulic	0.7%
‡Magnetic	0.4%
No transmission specified	9.1%

* Type as Rudge, Philipson, Wooler.

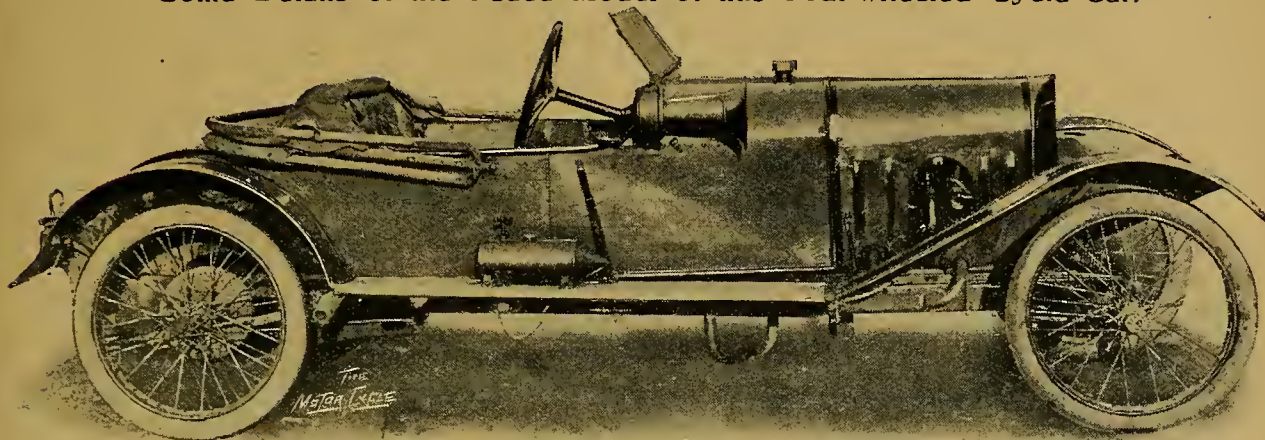
† Type as Zenith countershaft Gradua gear.

‡ Mentioned as ideals.

In the sidecar group the infinitely variable gears specified include all the above systems and suggested systems in similar proportions.

THE 1919 G.N.

Some Details of the Peace Model of this Four-wheeled Cycle Car.



The standard model G.N. cycle car, fitted with a 90° 10 h.p. air-cooled twin engine, to be marketed at £140.

IT may be recalled that of the many cycle cars which appeared on the market in 1912 the G.N. and the Morgan have been the only two to survive. It has been a case of a survival of the fittest, and since Messrs. G.N., Ltd., have had some seven years' experience in the construction of four-wheeled cycle cars, and have announced their intention to continue the manufacture of this type of vehicle, particulars of the improved peace models will undoubtedly be of interest.

The new models are improved in detail throughout, and the only drastic alteration is the abandonment of the belt drive and the substitution of chains. These are four in number, and provide three speeds forward and one reverse.

As in the older model, the primary drive is by shaft from the engine to a countershaft which it drives by means of a bevel gear, but, instead of a second countershaft driven by chains from the first as in the pre-war type, four chain sprockets are carried on the live rear axle. Three of these carry chains directly from the sprockets on the countershaft, while the chain of the fourth is driven, when required, by a small sprocket on a subsidiary countershaft. This little countershaft carries a gear wheel which is made to engage with a pinion on the main countershaft, and so provides a reverse.

Chassis Details.

The change-speed lever works in a gate and through a selector, the engagement taking place by means of dogs. As the rear axle is of the solid variety, the two internal expanding brakes may be worked independently, so the brake on the off side is controlled by the pedal, and that on the right by means of the side lever. The pressed steel frame is mounted on quarter-elliptical springs. It is interesting to note that the front springs are provided with radius rods extending from the underside of the frame to the front axle. As regards the radius rods at the rear, the forward ends of these are mounted on chain adjusters, so that any slackness in the chains may be easily taken up. To revert to the brakes, the drums of these are 10in. in diameter and are 2in. wide, so that they should possess ample stopping power. Ball bearings are provided where necessary. A distinct improvement has been made in the steering, which is now

on more conventional lines, as the reduction gear is of the bevel variety and wire and bobbin control is no longer employed.

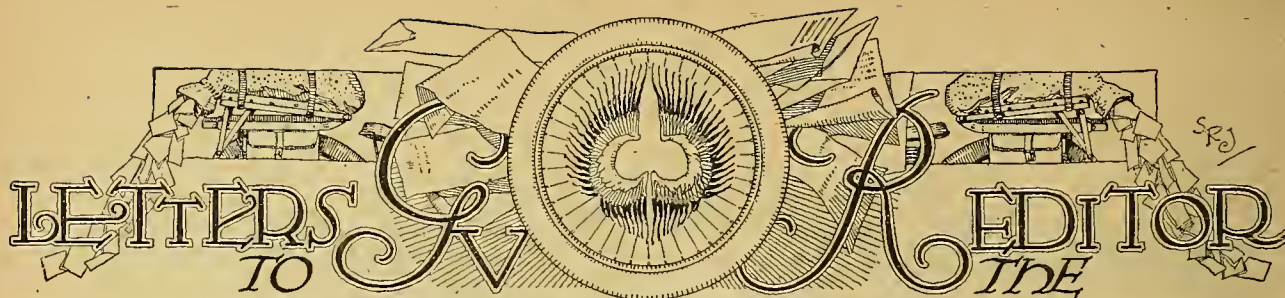
The 1919 G.N. is fitted with detachable wheels and 650 mm. x 65 mm. tyres. The wheelbase is 8ft., the track 3ft. 6in., the overall length 10ft. 3in., the height 3ft. 4in. (with screen 4ft. 1in.), ground clearance 9in., and weight 6½ cwt.

Engine Improvements.

It may be recalled that the pre-war G.N. was fitted with a 90° air-cooled twin-cylinder engine, the bore and stroke of which were 84 mm. and 98 mm. respectively (1,098 c.c.). The latest type is provided with an air-cooled oil sump, the cylinders are held on by four holding-down bolts instead of two; in fact, the whole power unit has been generally improved in detail. The Zenith car type carburettor should make the engine more controllable at slow speeds and capable of better acceleration. So as to get the maximum amount of cooling the cylinder heads project beyond the level of the sides of the bonnet and are thus exposed to the draught caused by the passage of the car through the air. In the old pattern this was detrimental, as the inlet rockers were unprotected from dust, and so liable to wear—a fault which has been overcome in the new model by the provision of enclosed rockers and valve stems. A heavy flywheel is fitted, and the clutch is of simple design, consisting of a single steel plate and two Ferodo-faced plates.

The complete standard equipment which is mentioned in the catalogue as an extra consists of hood, screen, spare wheel and tyre with bracket, electric lighting set (comprising head light, two side lamps and tail lamp, battery, switchboard, and dynamo), horn, pump, jack, tool kit, and number plates. With this equipment the standard car is to be sold at £167 10s., and without it at £140.

There is also another model, known as the Vitesse, which is 100 lb. lighter than the standard vehicle, and is fitted with a specially tuned engine. This model is sold at £195 with equipment and £170 without. The fully-equipped Vitesse G.N. is supplied with a celluloid screen, but there is no hood; otherwise it is fitted out in the same manner as the standard model.



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

VARIABLE IGNITION.

Sir,—I have a 1913-14 F.N. 5.6 h.p. motor cycle, fitted with a Bosch magneto (fixed ignition). It seems plain to me that I could get better running if the magneto could be made variable. I wonder if any one of your readers, who is a rider of the F.N., has made this alteration. I should be very grateful for a little advice on the subject.

H.H.T.

THE FUTURE OF SURPLUS GOVERNMENT MACHINES.

Sir,—I think Mr. C. S. Moore's suggestion that discharged soldiers should be given the privilege of buying Army motor cycles is good. Do not limit the purchasers to despatch riders, however, but allow all ranks who were motor cyclists prior to the war the opportunity.

From what I have seen of the majority of despatch riders Overseas, they seem to think that the average Tommy never had a motor bicycle. I have seen things which have made me smile many a time.

I should like to make a suggestion. Could you not have a section in your paper for the real cycle car such as the Morgan, G.N., Carden, and many others, like your Aviation Section, which has been very instructive and interesting?

I may say that I have had *The Motor Cycle* every week since published, and never missed, though sometimes it has arrived a week or two late while on the four different Fronts where I have served during the war.

F. P. CHANTER.

WHICH TYPE?

Sir,—I am one of the old brigade who still think that an 8 h.p. V twin, single-geared and belt-driven, is the ideal machine for touring work.

My 8 h.p. Matchless will do everything I want, and is the most flexible machine possible. Belt drive is absolutely satisfactory with these big engines, whatever it may be with smaller types. It is wonderful what an advantage the 1½ in. variety has over the smaller sizes. My belts regularly run 2,500 to 3,000 miles, and require shortening not more than three times in this distance. I find they can be run quite slack without slipping, and perhaps that is the secret of the satisfaction I have with them.

E. B. HALL.

Sir,—The very apparent success of the "Which Type?" plebiscite provides strong grounds for adopting the measure as an annual undertaking. The importance of a wide field of views cannot be over-estimated, and cannot fail to serve as an efficient weathercock of public opinions. An appeal to motor cyclists every September would receive immediate and enthusiastic attention from every type of keen rider.

In the light of past correspondence as to the suitability of the 3 h.p. twin Enfield for *sidecar work*, there is cause for comment upon the general desire of 500 c.c. for *solo*. During the past seven years I have ridden various h.p.'s, but must candidly admit that a three-speed 2½ h.p. twin Humber tops the roll, and has been undergoing heavy work (two up) for four years, and can still show its dust to a large number of late model 3½ h.p.'s. Both the Humber I have owned have an astonishing aptitude for long life. I shall certainly sample the new flat twin.

A. STANLEY BLICQ.

Guernsey.

SPRING FRAMES.

Sir,—Concerning "Ixion's" comments dealing with the question of spring frames, I am strongly of the opinion that when the correct design of springing has been evolved, of comparatively light weight, though of strong construction, and without that great drawback lateral play, this type of

machine will prove to be actually faster than the fixed frame variety, in that the driving wheel, no matter what the speed, will more readily adapt itself to the condition of the road. Also, by reducing "bounce," it will materially lengthen the life of the rear tyre. I, too, have ridden different kinds of spring frames, only to discover, somewhat to my cost, the unmistakable presence of lateral play; this with but one exception, a little machine, beautifully made, as old as the hills, and of Hun origin, glorying in the name "Wanderer." Among the "nuts" of Hampstead this machine was an outcast, although furtive glances would sometimes be levelled at it when I was not looking. It just bristled with cute mechanical stunts, and the springing of the frame was "it." Tramlines, wet or dry, quickly discover lateral play.

VIC.

Finchley, N.W.

REAR LAMPS ON CYCLES.

Sir,—I enclose for your perusal a leaf out of a contemporary of recent date in which the writer holds forth against D.O.R.A. for compelling cyclists to carry red rear lamps.

This particular scribe has been very venomous in agitating against this infiction, as he calls it, and I would dearly like to answer him in *The Motor Cycle*.

He has been accusing motorists generally of being selfish and domineering, and suspects they will do all in their power to make cyclists carry a rear lamp permanently after the lapse of D.O.R.A. I have written to protest against this attitude, but my letter was not published.

Please do not think the journal to which I refer speaks for all cyclists in this respect, because I assure you, as one of them, I know many will continue to use the lamp in any circumstances, not only because they consider it safer for themselves, but also out of a gentlemanly desire to maintain the true spirit of the road, which prompts them to assist other road users all they can.

CORPORAL ELSIE.

Hereford.

SIDECAR OR CYCLE CAR?

Sir,—Although my experience of motor cycling has been short (I had a little 2½ h.p. two-stroke from about the end of 1915 to the beginning of 1917), this was sufficient to give me a taste for the sport. I am on the look-out for something now that will carry three others besides myself, but the prices of the new medium and heavyweight combinations almost stagger one, notwithstanding the article in your issue of January 16th on current prices. I wish it could be proved that prices are not more than 25% up on pre-war rates. One cannot expect them ever to be at pre-war rates, as the whole conditions have changed, we hope, in many respects for the better; but when what used to be considered a moderate-priced combination is listed to-day at £142 or thereabouts, and a four-wheeled cycle car is going to be produced at £167 10s., the latter, too, complete with dynamo lighting, spare wheel, tools, etc., it makes one hesitate between the combination and the cycle car (or three-wheeled runabout) proposition, and after the present great demand for all kinds of motor vehicles has been reduced, the makers of combinations will have to look out. At least, that is the opinion of one who may be perhaps only an amateur with little road experience; but on paper the combination is losing its attractiveness because of its great increase in price against other attractive propositions.

The best policy, to my mind, for those with only a moderate sum to spend is to "wait and see."

THOS. W. WHITTAKER.

R.P.M.

Sir,—We notice from your issue of December 19th, 1918, in a reference to the Harley-Davidson lightweight, a remark that "the makers claim that the engine attains the highest crankshaft speed of any petrol engine built."

This is very interesting to us, as we are under the impression that the 8,000 r.p.m. attained by an A.B.C. engine holds this record, and we should very much like to challenge, in a friendly way, the engine to which you refer (or any other engine for that matter) to attain, under the same conditions, a higher crankshaft speed than that attained by us at the present moment. A.B.C. MOTORS, LTD.,

GRANVILLE BRADSHAW, Engineer and Manager.

INSURANCE.

Sir,—A few weeks ago I read a short paragraph relating to a new scheme of insurance now being worked in America. By placing a coin or two in an automatic machine a disc is returned, and this covered a riding period of twenty-four hours, but I do not know whether this covered man or machine. For my own part I consider this method far before the ordinary English way. Here, if we pay, say, £3 17s. 6d. for a policy, and by ill-luck we do only two or three months' riding, the insurance pans out at over £1 per month. With the new penny-in-the-slot business riders pay for the *actual riding time only*. Perhaps some of your other readers can supply more details. AUTOMATIC.

Dalton-in-Furness.

THE COMMUNAL GARAGE.

Sir,—I was greatly interested in your article in *The Motor Cycle* of January 2nd on garaging of motor cycles. Some time before the war I wrote to you, suggesting that a firm of accessories dealers should build a place after the style of a public swimming bath, and in the centre of the building have a stores where petrol, oil, and any accessory could be purchased, and round the outside small boxes built to take sidecar or solo machines, which could be hired at a reasonable price for six months.

If some system of garaging were possible in London, it would enable many a young fellow who is in lodgings to have a motor who at present cannot have one because his landlady will not let him bring one into the house.

I hope *The Motor Cycle* will push this topic, so that some of us unfortunate youths can have a taste of the open road, and make an A1 population, as we are very much C3 now. W. C. STEVENS.

THE THREE-JET BINKS CARBURETTER.

Sir,—May I say a few words through the medium of your journal on the somewhat mysterious "dead spot" subject in connection with the Binks carburetter.

I have had considerable experience with various models of this instrument since 1909, and, properly tuned with the correct jets, no "dead spot" occurs during the jet change over; but with wrong size jets there is a certain amount of hesitation and possibly actual stoppage of engine in changing from one jet to another.

For the benefit of your readers and any who may be contemplating the fitting of a Binks carburetter, may I suggest the method of procedure for its fitment? In the first place see that it is the right size for the engine. For instance, a 4 h.p. single-cylinder will require a larger instrument than a 5 h.p. twin, because it has a larger lung or cylinder. A lot of trouble is caused owing to the purchase, from dealers and other agents, of the wrong size and type, making it next to impossible to tune the engine up in a satisfactory manner.

Bear this in mind, as there are at least fourteen different models of the Binks carburetter for motor cycles alone. So, having made sure of the right type, see that it is a tight fit on the engine stump. The next thing is to test the pilot (or smallest) jet by endeavouring to start the engine. If it refuses to start, the jet is too small, so fit a size larger; if it starts and, upon opening the extra air a little, races or appreciably accelerates, the jet is too large, so fit a size smaller.

The same procedure is adopted in tuning up the second pilot jet. Now, on opening to the main jet, if it is a size too small, the engine will hesitate slightly; if it is two or three sizes too small, it will stop altogether. If it is too large, it will unduly accelerate upon opening the extra air valve, and, incidentally, be rather greedy for petrol.

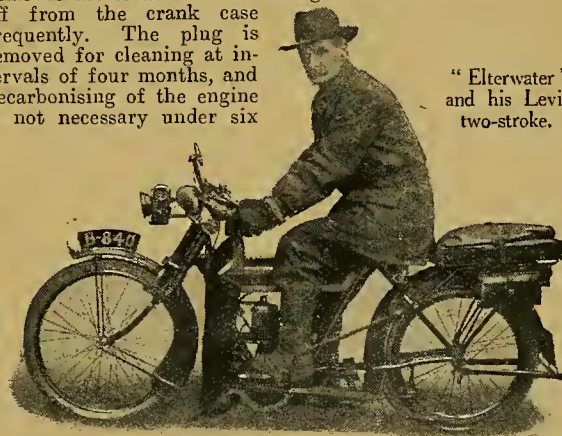
The spring clip at the bottom usually gives the best results with the holes half covered; this has no influence whatever on the first and second pilot jets.

I usually adjust the gas lever so that when it is closed the engine is running on the first pilot jet; it is then impossible to set the levers wrongly in starting, and it just keeps the engine ticking over in traffic. Of course, it can be stopped by opening the extra air lever.

By spending half an hour on these simple experiments one is well repaid by the machine's beautiful running throughout its life, and an easy start off is always obtained without any injections or lifting of the exhaust. Although this carburetter is primarily designed as a single-lever automatic, the extra air lever is there for experiments and varying climatic conditions. A. C. ROBBINS.

ADVANTAGES OF A TWO-STROKE.

Sir,—Anent the ever-returning controversy respecting two v. four-stroke machines, perhaps my experience with a Baby Levis will interest and influence decisions as to choice of a handy knockabout mount. Bought in 1915, second-hand, the motor cycle has been constantly in use in the hilly country around the head of Morecambe Bay. It has an Amac carburetter (first a No. 26 jet, now a No. 20), ignition 4in. advanced, Sphinx mark C25, and two-stroke plug. No difficulty has been experienced in starting, except from stone cold in winter when a thimbleful of petrol (!) through the release valve removes the trouble. Lubricating oil is used freely, but run off from the crank case frequently. The plug is removed for cleaning at intervals of four months, and decarbonising of the engine is not necessary under six



"Elterwater" and his Levis two-stroke.

months. For winter riding a hot air intake is fitted, but for the warmer weather a leather tube extension is used plus an extra air inlet into the induction pipe. The latter removes any tendency to four-stroke, and adds 5 to 10 m.p.h.

Light in weight, the Levis can show heels to anything its horse-power, and delights in rising ground ("Ixion" can say "rot" if he likes), and the makers rightly state "hard work is good for the Levis" (usual disclaimer, please). At speed the "speech" of the engine is akin to an aeroplane, and there being very few two-strokes round this district the hum is well known.

A temporary mudshield is fitted, and also footboards. Consumption usually 110 to 140 m.p.g. Have several times done 150 m.p.g., and this with the apology of stuff sold as petrol. Can any four-stroke do better? The even pull of the two-stroke and total absence of vibration from the engine is delightful, as also is the ability to paddle off.

Carnforth.

ELTERWATER.

AIDS TO STARTING.

Sir,—I read in your columns of the improvement aero engineering is to effect in motor cycle engines, but no one so far has pointed out one drawback. Aero engines are designed on the assumption that nothing but the very best No. 1 petrol will be used in them and the finest lubricants around them. Yet in other of your columns you advocate the use of benzole, alcohol, and mixtures of different kinds in engines designed for petrol. I wonder, sir, if you have tried the substitute nearest to hand, viz., No. 3 war spirit. I have, in one of the most easily started two-strokes on the market (Velocette), and I have given up the wrestling match. I dope it through the sparking plug hole five, ten, twenty times a day.

Yet, sir, in your preliminary account of the A.B.C. you say no kick starter is to be fitted, but the paddle-off method is to be reverted to. Few advertisements of any but very big machines mention a kick starter; the 2½ h.p. Blackburne is the only one I know of. Would it be a legitimate deduction that Mr. Bradshaw and the other designers have never had to use No. 3 spirit? If so, I should be very glad to lend my machine and half a gallon of No. 3 to Mr. B. the next frosty morning, if I may be allowed to watch him "paddle off"—no priming, hot water flannels, or blow lamp heating to be permitted.

Seriously, however, I think designers and makers ought to bear in mind that No. 1 petrol is not always to be had, and that other and home-produced fuels are available in increasing measure if the demand arises. Emergency priming cocks, induction system heaters, and kick starters should be fitted to every machine. Incidentally, the greater the range of suitable fuel available, the more people would buy it, and petrol prices would be lowered by competition.

I have no interest in any cycle, fitment, or fuel, but am merely a very TIRED TIM.
[We also have tried No. 3 petrol, and cannot say that we like it on a frosty morning.—Ed.]

PRICES.

Sir,—“H.L.I.” evidently does not understand the first rudiments of business, which are to buy at the lowest price possible and sell at the highest; also that the value of any article is the price which can be obtained for it.

What reason is there that the dealer referred to in “H.L.I.’s” letter should not put his price up for the combination in question? He has bought it in a favourable market, and the market has risen. Had the market fallen he would not have been able even to obtain his original price. When prices come down, which they are bound to do some time, this agent may have several machines in stock which he will have to sell at a loss. It works both ways, and is the ordinary method of doing business in all trades in which there is a fluctuation of prices.

I should like to add that I have no connection whatsoever with any motoring business.
B.H.V.
Shipley.

Sir,—What a commendable modesty seems to have suddenly developed, almost to an epidemic extent, in the minds of the motor manufacturers of every type: modesty in the sense that they are reluctant to shock the nervous system of the present or potential buyer of the goods they advertise by stating in cold print the selling price. One’s mind is unconsciously carried back to the days of the boom, when many cycle makers supplied their customers with their wares as an act of grace!

This tone largely permeates the “announcements” of a number of present-day advertisers, practically all of whom, of course, have had a good time since 1914, and have participated in the good things the war has provided for them.

We are told that wages have increased enormously, and also raw material costs. The writer, from his own personal knowledge, admits the truth of these statements; but, even so, there are other factors to be taken into consideration by those makers of motors who would seek the favour of the buying public. They, in common with all who have goods to sell, have got so thoroughly used to the daily atmosphere of the past four years of inflated (and often unholy) profits.

It is, of course, common knowledge that many of the smaller fry have to thank the war for their present affluent position, but these will no doubt soon be brought to at least the common everyday level, even though they may not revert to type. But as regards the big firms, they, perhaps not unnaturally, will hope to continue to make the huge profits to which they have now become accustomed; but whether their anticipations will ever be realised remains to be seen, for, after all, the public will have to find the money to provide the profits. Will they be willing to do so? That is a question time alone will answer. It is quite possible that an altogether new type of purchaser will arise out of the topsy-turvydom of this England of ours, and, if so, how far will he absorb the huge outputs which we all hope to see created?

I have had daily opportunities of discussing this price question with a huge number of old motor cyclists—enthusiasts who have been the real backbone of the sport, and who have, quite uncomplainingly, made it possible to

pay the 40% dividends of the pre-war period. They feel, with me, that, instead of makers endeavouring to maintain (and possibly even to increase) such figures of dividend, they should, instead of participating in the general scramble for unholy profits indulged in by every purveyor of goods from wire nails to aeroplanes during the war period, rather take their share of life’s burdens by being satisfied with a reasonable return on their capital. Doubtless it is an absurd proposition to put forward, human nature being what it is, but, after all, the buying public will see to it that no super fancy prices are paid, and thus those makers who are proposing to charge £85 for a motor cycle *worth little more than half that figure* will come down to common earth once more.

So much has the picture of huge post-war demands for motor cycles, and of unseemly scrambles to obtain a machine, whatever the price, been placed before our eyes, that we have almost come to believe it as being true; but we shall see.

I sincerely hope, as do all good Britishers, that all expectations as to output and demand will be realised, but there undoubtedly is a very real danger of output being restricted, to some extent, by the tendency to charge fancy prices. The present policy is certainly likely to have a strangling effect upon the industry, and that we should all deplore.

One other point is that fully 95% of the types that will be offered will be 1914-15 models with a few minor improvements tacked on, as it is common knowledge that the *real up-to-date model will be reserved for the 1920 market*, so that, in addition to paying through the nose for a machine, one will have an obsolete model on one’s hands.

Another disturbing factor both to producer and consumer will be the disposal of the hundreds of thousands of war motor cycles. This element, in conjunction with the revolution both in design and price for the 1920 models, is likely to militate very considerably against the stability of things motoring for the 1919 season, and the makers will be wise to consider well what their 1919 prices shall be.

I rather imagine that all old motor cyclists who buy a new model every year will shun these obsolete types, and purchase where real merit justifies the large capital outlay. This, I know, will happen in a large number of cases, and I rather fancy that some manufacturers will find disappointment permeating the results of their efforts, and perhaps deservedly so.
ROMANESQUE.

Dudley.

Sir,—I have before me “The Buyers’ Guide” for 1919, published in *The Motor Cycle*, and am surprised to read of the high prices asked for post-war models.

We now know of sidecar combinations costing £140 or more, yet cycle cars are comparatively cheap. One would imagine that if motor cycles cost more to produce, so also would cycle cars.

As a result of these prices, I think there will be a “run” on cycle cars, and sidecar prices will have to come down. Cycle cars like the Morgan will be very popular, and I believe manufacturers will have difficulty in making the supply equal the demand. I know personally one motor cyclist who is contemplating the purchase of a three-wheel cycle car, solely on account of the high prices asked for some sidecar combinations.

May I suggest that motor cycle manufacturers lower their retail prices, and be content with a smaller profit? If they do this, they will surely have a greater demand for their productions.
W.

Manchester.

BOOKS FOR MOTOR CYCLISTS

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QUESTIONS AND REPLIES

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C.4, and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

Benzole as a Fuel.

?

(1.) Is neat benzole easier to start on than Grade 3 war petrol? (2.) Can it be satisfactorily mixed with petrol? (3.) Does it require a special tank? (4.) Does it eat into and spoil the enamelling? (5.) How does it compare with petrol from the point of view of m.p.g. and carbonisation? (6.) Are most garages likely to stock it in future? (7.) What is the bore and stroke of the $2\frac{1}{2}$ h.p. four-stroke O.K. with O.K. engine (m.o.i.v.), 1915? (8.) My crank case release is *via* the hollow crankshaft. What would cause considerable smoke to issue after three minutes' fast running?—F.C.C.

(1.) Benzole gives an easy start, unless actually frozen. (2.) To prevent benzole freezing, it is best to mix it with petrol in the proportion of one-third petrol and two-thirds benzole. (3.) No special fittings are required. (4.) If it is spilt over the enamel, it may destroy it, but if it is wiped off at once with an oily rag no harm will ensue. (5.) The consumption is better and the carbon deposit about the same, though the deposit appears to be of rather a softer nature. (6.) We expect so. (7.) The bore and stroke are 70x70 mm. (8.) Probably the vaporisation of the oil in the crank case, due perhaps to a slight excess of oil. If the smoke is excessive there may be leakage past the rings.

Registration.

?

(1.) I purchased a Rudge-Multi clutch combination numbered M4204. The seller informs me that the machine has been in his works for three years or thereabouts. It has not been registered by him, and he does not know who the man is or what steps he has taken about the number. What should I do—try to get the number transferred to me or get a new number? If the former, to whom should I apply? (2.) The machine was driven to me (about twenty miles) a few days ago and was then going well. I cannot now start it, even after heating the cylinder and carburetter with a blow-lamp and injecting petrol into compression tap. Can you suggest a method of starting? (3.) On pressing down the starting pedal—with all closed—there is a slight hissing noise, indicating a leakage about the top of the cylinder head, which is apparently bolted on. Does it require a new washer, and if so, of what should the washer be made?—J.F.G.

(1.) You should write to the Clerk of the County Council of Cheshire, Chester, and ask for the number to be transferred to your name. He will then send you a form to sign, with the request for 1s.—that is to say, if the number has not been already cancelled. If it has been, you will have to re-register the machine, which you can do with any County or Borough Council in the United Kingdom, paying a fee of 5s. (2.) It is just possible that the fibre bush in which the rocking arm of the magneto works has swollen through damp. You should therefore remove the contact breaker cover, rotate the engine and watch if the rocking arm is moving. (3.) Admission of air at this point may account for the difficult starting, and a new washer is required. These washers are usually copper and asbestos.

pression is fairly good. Up to now I have been using B.B. oil. (3.) I have never been able to get more than 70 m.p.g.; now I cannot get 40. (4.) How should the magneto be timed?—G.C.

(1.) We should say that the jet in question is rather too large, and you might try No. 31 or 32. A single-point plug with substantial electrodes should not cause pre-ignition. (2.) It is quite time to take the engine down, grind in the valves, clean out the carbon deposit, fit new valves if such are required, and generally overhaul the engine. (3.) It is rather hard to say why the petrol consumption should have gone up; 70 m.p.g. is quite good, but of course the consumption you speak of is ridiculously high, and you might try a smaller jet, as first of all suggested. Probably there is a leak somewhere. (4.) The magneto should be timed in the following manner: Place the piston exactly on top of the compression stroke and connect up the magneto with the points just about to break and the ignition lever two-thirds retarded.

IMPORTANT NOTICE.

GOODS MADE IN GERMANY.

The proprietors of this journal, being fully in accord with the recommendations agreed upon at the Paris Economic Conference, give notice that they will not permit the advertisements of new goods manufactured in enemy countries to appear in this publication.

ILIFFE & SONS LTD.

Knocking and Overheating.

?

I have a 1915 $3\frac{1}{2}$ h.p. T.T. Rover (fixed engine), fitted with a Philipson pulley and B. and B. carburetter, 34 jet. Is this the correct size? I use a single-point aero plug. My greatest troubles are knocking, overheating, and high petrol consumption. It is geared $3\frac{3}{4}$ to 1, and is very fast when in good order. (1.) After running about a mile the engine gets very hot, and at the first incline starts knocking. Retarding the spark and closing the air does not ease the knocking much, but makes the engine lose power. Will you please tell me the cause. I have just fitted a new carburetter float because the old one leaked, and this had no effect on the knocking, but gave more power. (2.) Do you think I ought to take the engine down and grind in the valves? The valve tappet clearances are correct, as I have tested them. I took the engine down twelve months ago, and it has not done a great deal of work since, so I do not think carbon deposit should cause the overheating. The com-

RECOMMENDED ROUTES.

NEW CROSS (LONDON) TO HULL, VIA WOLVERHAMPTON.—F.H.

Regent's Park, Finchley, Barnet, St. Albans, Redbourn, Dunstable, Fenny Stratford, Stony Stratford, Towcester, Daventry, Dunchurch, Coventry, Birmingham, Wednesbury, Wolverhampton, Bloxwich, Brownhills, Lichfield, Burton-on-Trent, Derby, Nottingham, Newark, Lincoln, Brigg, Croxton, Hull.

AYR TO HENDON (LONDON).—S.R.

Ayr, Ochiltree, Cumnock, Sanquhar, Thornhill, Dumfries, Annan, Longtown, Brampton, Alston, Newbiggin, Barnard Castle, Scotch Corner, Boroughbridge, Wetherby, Aberford, Doncaster, Bawtry, Retford, Newark, Grantham, Stamford, Alconbury, Eaton Socon, Biggleswade, Baldock, Welwyn, Hatfield, Barnet, Finchley; at Church End (Finchley) take the right-hand fork for Hendon. Approximately 380 miles.

MILLOM TO TAVISTOCK.—J.H.B.

Milom, Broughton, Gethwaite, Greenodd, Newby Bridge, Kendal, Lancaster, Preston, Wigan, Warrington, Tarporley, Whitchurch, Wellington, Bridgnorth, Kidderminster, Worcester, Tewkesbury, Gloucester, Stroud, Nailsworth, Bath, Wells, Glastonbury, Durston, Taunton, Cullompton, Exeter, Okehampton, Tavistock. The surface is likely to be rather better *via* Moretonhampstead and Two Bridges, but this is an exceedingly hilly road.



Dissolution of Partnership.

Messrs. the Eastern Garage Co., of Forest Gate, E.7, advise us that a dissolution of partnership having been mutually agreed upon between Mr. J. L. Love and Mr. Chas. E. Lovett, the latter, as sole remaining partner, will carry on the business.

A Rumour Denied.

For some time there has been a persistent rumour that the A.J.S. Co. is intending to market a light car. There is no truth in this rumour, and the Wolverhampton firm will continue to concentrate on the sidecar machine.

Change of Title.

We are informed that the Forward Motor Co., the manufacturers of the Forward sparking plug, will in future be known as the Forward Sparking Plug Co. The proprietorship of the company and its general trade policy will in no way be altered, the change of name being merely to indicate the nature of the business.

[Burberry's Peace Year Sale.

Burberrys, Haymarket, are now holding a sale of weatherproof garments. Included in the sale are a number of Service weatherproof garments and several articles of naval and military equipment which have either been used as models or left on hand in the course of the year's business.

Henderson Motor Cycles.

We are informed that Mr. T. W. Henderson, the manager of the sales department, the Excelsior Motor Manufacturing and Supply Co., the makers of the American Henderson motor cycle, will shortly visit this country. Mr. Henderson is intending to stay in Europe indefinitely as the European representative of his company, and will have his headquarters in London. The London representatives of the Henderson are Messrs. Robertsons, 157b, Gt. Portland Street, London, W.1.

Catalogues Received.

Messrs. Alldays and Onions' preliminary catalogue for 1919 is to hand, and is rather more complete than the average advance list. The Allon two-stroke motor cycle is fully described and illustrated by upwards of a dozen pictures.

A well got up and usefully compiled catalogue has been published by the Hoffmann Manufacturing Co., Ltd., Chelmsford, Essex. This gives minute details of their numerous ball and roller bearings, many of which are suitable for motor cycles. The catalogue may be obtained on application to the company.

We are in receipt of the advance 1919 list of Wooler motor cycles, published by the Wooler Engineering Co., Ltd., Alpertons, Middlesex.

Where Benzole may be Obtained.
Messrs. Selfridge inform us that their motor department can now supply benzole in two-gallon cans.

The Enfield Two-speed Gear.

We are advised that the Enfield Co., Redditch, is again in a position to accept trade orders for early delivery of its two-speed gear.

Rudge Preparations.

Preparations at the Rudge-Whitworth works for a very large output of motor cycles are rapidly progressing, practically all this company's munition engagements being completed.

Fire at Birmingham.

We regret to learn that the premises of Messrs. S. Smith and Sons, Ltd., at 122, Alma Street, Birmingham, were completely destroyed by fire on the morning of the 10th inst. Customers are requested to be good enough to address their enquiries to the London address of Messrs. S. Smith and Sons, Ltd., 179-185, Great Portland Street, W.1.

The Premier Runabout.

Messrs. Coventry Premier, Ltd., advise us that they have received over a thousand enquiries concerning their new runabout from the announcements which have appeared in *The Motor Cycle*. We are asked to state that the advance list is not yet ready, and that, owing to the abnormal conditions prevailing at the present time, it is impossible for them to write to each applicant pending delivery of the list.

The Bluemel Programme.

Messrs. Bluemel Bros., of Wolston, near Coventry, advise us that they are continuing to manufacture the same accessories as before the war. In addition, they are putting on the market an improved form of windscreen, which, from experiments carried out, effectively protects the sidecar passenger from the wind and rain in anything but a very heavy storm.

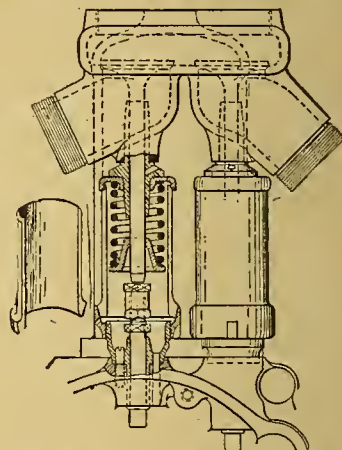
C.A.V. War Work.

The firm of Messrs. C. A. Vandervell and Co., makers of the well-known C.A.V. magneto, have during the last four and a half years manufactured many devices which have helped us to win the war. Mr. H. A. Midgley, the company's chief engineer, evolved a wonderful little fuse for trench warfare, which has been used successfully in the Stokes trench gun, while other fuses for aeroplane bombs and hand grenades were also manufactured. Many tanks were equipped with C.A.V. starters, which were also fitted to "M-L's." A special type of starter magneto for aeroplanes was also made. Curiously enough, one of these was found in a captured German aeroplane, and it is now back at the C.A.V. works. C.A.V. electric lamps were used for numerous purposes—in a very neat, compact, and simple signalling set, for example, and in tank lighting installations. While Mr. Vandervell himself stayed at his post at the works, all his brothers and his eldest son joined the Colours. One of the brothers, Maj. Frank Vandervell, served in the Tank Corps.



Valve Mechanism.

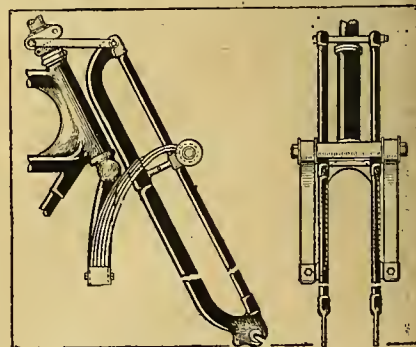
The object of this invention is to provide improved means for mounting protecting cylinders over valve rods and springs. These covers are provided with external tapers on one or both extremities to engage with internally tapered fixed members and adjustable nut members. The internal taper on the abutment, engaging with the external tapers, presses



the constituent parts of the cover together, and secures them in position. The covers or cylinders are made in two parts, and are held together by the adjustable taper members at the lower extremity.—F. A. Kimberley and the James Cycle Co., Ltd., Birmingham, No. 117,235, July 11th, 1918.

A Leaf Spring Fork.

In this design only one pair of links is used and the springs are approximately vertical. With this device two distinct motions are obtained, one in a vertical and the other in a longitudinal direction. It is not altogether a good-looking fork in the form shown here, and probably the springs would be exposed to the mud thrown up by the front wheel, but these points can be modified, and do not affect the feasibility of the design.—G. Rigby, Manchester, No. 117,300, July 12th, 1918.



A spring fork patented by G. Rigby, of the Royal Ruby Company.



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3. We can hire you a good Second-hand Machine with which to carry on until the new model is ready for delivery, at the nominal cost of 20s. per week.
4. We have definite contracts already placed to

the earliest possible delivery of the following makes:

ALLON, A.B.C., A.J.S., ARIEL, B.S.A., BLACKBURN, CALTHORPE, DIAMOND, ENFIELD, EDMUND, HARLEY, HUMBER, HENDERSON, JAMES, INDIAN, L.M.C., LEVIE, NEW IMPERIAL, NORTON, MORGAN, MATCHLESS, O.K., N.U.T., I.O.M. RUDGE-MULTI, N.U.T., ROYAL RUBY, TRIUMPH and ZENITH.

5. We can deliver from stock the undermentioned New Machines:

ALLON, 2-speed, 2-stroke	48 gns.
ARIEL, 3½ h.p., 3-speed	280 0
B.S.A., 4½ h.p., 3-speed, chain-cum-belt	76 gns.
CALTHORPE, 2-speed, 2-stroke	40 gns.
CALTHORPE-J.A.P., 2-speed	45 gns.
EDMUND-J.A.P., 1919, 2½ h.p., Enfield 2-sp. gear and clutch, spring frame	60 gns.

NEW IMPERIAL, 1910, 2½ h.p., 2-speed .. 48 gns.
HAZLEWOOD, 4 h.p., 3-speed 79 gns.
ALLDAYS, 4 h.p., 3-speed, 4-spoke 79 gns.
6. Deliveries of further ARIEL, B.S.A., CALTHORPE, JAMES (42, 5-6, and 2½ h.p. models), LEVIE, and ZENITH machines are expected this month.

7. You will probably have decided by now that you will not stand much chance of getting a machine unless you order in advance. All that you now want to decide is with whom to place your order. We do not want to say that we are the largest London contractors for new machines. This, as yet, we do not know. We can only state that we have on order a VERY LARGE NUMBER of every make, and that we shall not state a delivery date unless we are reasonably assured that the makers can deliver.

B. SECOND-HAND MACHINES.

TERMS OF DEALING.

1. **THREE DAYS' FREE TRIAL.**—Your money back in full within three days of purchase if not satisfied.
2. **THREE WEEKS' OPTION OF EXCHANGE.**—Your machine can be exchanged free of charge for anything else from stock within three weeks of purchase, if not satisfied.
3. **THREE MONTHS' FULL GUARANTEE.**—The same guarantee that the makers give with a new machine.

Our stock of Second-hand Machines is still unequalled in London, and fresh stock is arriving daily.

SELECTION FROM SECOND-HAND STOCK:

A.J.S., 1917 4 h.p., 3-speed, as new	85 gns.
A.J.S., 1916, 2½ h.p., 3-speed, clutch, k-start	55 gns.
ALLON 1918 5-6 h.p. twin 2-speed Combination, Lucas dynamo lighting, sporting Sidecar, spare wheel, as new	115 gns.
AMERICAN EXCELSIOR 7-9 h.p. 3-speed Combination, dynamo lighting; run under 1,000 miles. late 1916 model	98 gns.
ARIEL 1914 3½ h.p. 3-speed Combination	45 gns.
ARIEL 1916, 3½ h.p., 3-speed	62 gns.
B.S.A. 1912 4 h.p. 2-speed Combination	38 gns.
CALTHORPE-J.A.P., 1918, 4-5 h.p., twin, 2-speed, clutch	68 gns.
CALTHORPE-J.A.P. 1916 2-speed, clutch	32 gns.

CALTHORPE, 1916, 2-speed, 2-stroke	29 gns.
CONNAUGHT, 1916, 2-speed, 2-stroke	27 gns.
DOUGLAS 1916 4 h.p. 3-speed Combination	89 gns.
DOUGLAS 1915 4 h.p. Combination	72 gns.
ENFIELD, 1916, 3 h.p., 2-speed, clutch, kick-starter	42 gns.
F.N., 1914, 5-6 h.p., 4-cylinder, clutch, kick-starter, sporting Sidecar	68 gns.
HARLEY-DAVIDSON 1916 7-9 h.p. Combination, magneto model	89 gns.
HENDERSON 1915 10 h.p. Combination hood, sc'n.	89 gns.
HENDERSON, 1915, 10 h.p., fine coach Sidecar, as new	95 gns.
HUMBER 1918 6-8 h.p. water-cooled Combination	85 gns.
HAZLEWOOD 1916 6 h.p. 3-speed Combination, as new	85 gns.
HUMBER, 1913, 3½ h.p., 2-speed	27 gns.
HUMBER, 1914, 2 h.p., good order	17 gns.
INDIAN, 1915, 7-9 h.p., khaki finish, spring frame, countershaft gears, clutch, kick-start	50 gns.
INDIAN, 1914, 7-9 h.p., 2-speed	39 gns.
INOIAN, 1915, 5-6 h.p., 3-speed, sporting Sidecar	75 gns.
IVY, 1916, single-speed, 2-stroke	23 gns.
JAMES, 1916, 3½ h.p., twin, 3-speed, clutch, kick-start	59 gns.
JAMES, 1914, 4½ h.p., single-speed, renovated	32 gns.
LEVIE, 1916, Popular, single-speed	23 gns.
L.M.C., 1915, 4 h.p., 3-speed	47 gns.

MATCHLESS, 1915, 6-8 h.p., 2-speed countershaft	58 gns.
MATCHLESS 1914 3½ h.p. twin 3-speed Combination	48 gns.
MATCHLESS, 1914, 6-8 h.p., 6-speed	39 gns.
MORGAN, 1914, sporting, air-cooled	78 gns.
MOTOSACOGNE, 3½ h.p. twin, 2-speed, cl.	45 gns.
NEW HUDSON, 1914, 3½ h.p., 3-speed	35 gns.
N.S.U., 1914, 2 h.p., 2-speed, clutch	26 gns.
N.U.T., 2½ h.p., T.T., o.h.v. twin J.A.P.	42 gns.
NORTON, 1914, 3½ h.p., T.T.	35 gns.
PREMIER, 1916, 3½ h.p., 3-speed	59 gns.
PREMIER, 1915, 3½ h.p., 3-speed	45 gns.
PREMIER, 1914, 3½ h.p., 3-speed	38 gns.
PREMIER, 1913, 2½ h.p., clutch	23 gns.
P. & M. 1915 3½ h.p. 2-speed Combination	65 gns.
ROVER, 1915, T.T., Philipson	45 gns.
ROVER, 1918, 3½ h.p., 3-speed, Rover coach Sidecar	92 gns.
RUDGE-MULTI, 1916, T.T., I.O.M.	59 gns.
RUDGE-MULTI, 1915, 3½ h.p.	48 gns.
RUDGE, 1913, 3½ h.p., T.T., single-speed	27 gns.
REX-T.T., 6 h.p., T.T., sloping tank	35 gns.
REX late 1914 6-8 h.p. coach Combination	69 gns.
SUNBEAM, 1915, 6 h.p., 3-speed, good coach Sidecar	89 gns.
SUN-VILLIERS, 2½ h.p., 2-speed	32 gns.
SUN-VILLIERS, 2½ h.p. single-speed	25 gns.
SWIFT Cycle Car, 7-9 h.p., 1915	145 gns.
TRIUMPH, 1914, special T.T., fitted J.A.P. engine	36 gns.
ZENITH-GRADUA, 1915 4-5 h.p. twin, countershaft	52 gns.

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MOTOR CYCLES FOR SALE.

Douglas.

1914 T.T. 2½ h.p. Douglas, overhauled by an engineer, complete with accessories; open to expert examination; £38/10, no offers or dealers; after 8 o'clock.—Richardson, 20, Heath Hurst Rd., Hampstead. [X2477]

ELI CLARK can give you good advice also good deliveries of 1919 Douglas motors. He will help you if possible with spares. The man on the spot.—196, Cheltenham Rd., Bristol. 'Phone: 4169. Wires: Ignition, Bristol. (Please do not send sample spares.) [X2477]

DOUGLAS. 4 h.p. and 2½ h.p., brand new models, in stock. We are stockists and specialists of Douglas machines only, giving the finest service and the greatest choice of models in the South. Over nine years' experience as Douglas agents.—Thompson and Co., 408, Commercial Rd., Portsmouth. 'Phone: 7105. [X2518]

2½ h.p. Douglases, brand new, in stock, immediate deliveries, fitted 2-speed gears, touring or semi T.T. bars, footboards 15/6 extra, £60; two best lamp sets, horn, registration, writing plates, £4 extra. Enquiries invited. Full specification by post.—Douglas specialists, Robinson's Garage, Green St., Cambridge. [X2898]

4 h.p. W.D. Douglases, brand new, in stock; immediate deliveries; fitted 3-speed gear, clutch, kick start, £75; with Douglas coachbuilt sidecar, £95; three best lamp sets, horn, registration, writing number plates, £5/10 extra. Enquiries invited. Full specification by post.—Douglas specialists, Robinson's Garage, Green St., Cambridge. T.A.: Bicycles. Tel.: 388. [X2897]

DOUGLAS. Douglas, Douglas.—We have had four years with Douglas motor cycles under active service condition. Our experience and advice are at your disposal. We can give almost immediate delivery of a few of the famous All-black Douglas. Guaranteed early delivery of a limited number of 1919 models. We make a speciality of repairs and overhauls; spare parts stocked. Second-hand Douglas machines taken in part payment. If you are interested in Douglas motor cycles, call and see us.—Vivian Hardie, Ltd. Douglas Specialists, 24, Woodstock St. (off Oxford St.), Bond St., London, W.1. [X0978]

Enfield.

1916 Enfield, 3 h.p., complete lamps, etc.; £47.—Cross, Jeweller, Rotherham. [X2495]

ENFIELD. 2½ h.p., grey model, twin, 2-speed; £30 cash.—Wild, Longford, Middlesex. [X2606]

1917 Enfield 3 h.p. Twin, little used, perfect condition; £42.—Mapletons, Bradford, Berks. [X2821]

ENFIELD, all models, early deliveries.—J. A. Stacey, Sole Agent, 12, Ecclesall Rd., Sheffield. [X1543]

FOR Sale, 6 h.p. Enfield and Sidecar, 2-speed, as new; £90; appointment.—C. Brown, 25, Aberfeldy St., Poplar, E.14. [X2712]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries Enfields, all models. [X2261]

ENFIELD Combinations.—1915 and 1916, 6 h.p., hoods, screens, lamps, etc.; best offers.—51, Maplethorpe Rd., Thornton Heath, S.E. Any time. [X2769]

ENFIELD, May, 1916, 2-stroke, 2-speed, guaranteed as new, not done 200 miles, all accessories; £38.—Stone, 23, Wellington Rd., Gillingham, Kent. [X2802]

ENFIELD, 3 h.p., 1915, Cowey, Lucas lamp, horn, new Palmer cord, overhaul cost £12, little used since; £40.—Bunn, 2, Baker St., Northampton. [X2492]

1916 6 h.p. Enfield Combination, date guaranteed, fully equipped, overhauled Enfield works, smart trimout; £90.—Brawn, 94, High St., Beckenham, Kent. [X2763]

1914 6 h.p. Enfield Combination, 2-speed gear, in good condition throughout, coachbuilt sidecar, lamps, etc.; any trial; 55 gns.—43, Windmill St., Gravesend. [X2760]

1914 6 h.p. Enfield Combination, complete, all lamps, speedometer, light car tyres, new, mileage under 5,000; £60, offer; after 6.—354, Uxbridge Rd., Shepherd's Bush. [X2724]

1917 6 h.p. Enfield Combination, little used, with electric lighting, Euk starter, speedometer, mechanical horn, mirror, etc.; £120.—Bose, 4, Belford Rd., Edinburgh. [X2575]

ENFIELD, 1916, 3 h.p., chain, kick, cost £70, new condition throughout, mileage 800, accessories; take first £45, or private exchange 2-speed 2½ h.p. and cash.—2, Beechfield Rd., Huddersfield. [X2620]

ENFIELD, 1916, 8 h.p., hood and screen, £97/10; also 1916 3 h.p., semi T.T. bars, heap accessories, £57/10; exchanges arranged.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [X2655]

1917 6 h.p. Enfield Combination, Lucas lighting set, horn, speedometer, spare tubes, chains, plugs, original tyres on, low mileage, brand new condition throughout; bargain, £95.—25, Newsome Rd., Huddersfield. [X2364]

ENFIELD 6 h.p. Combination, late 1916, electric lighting set, horn, luggage grid, sidecar cover, etc., unsatished, indistinguishable from new, mechanical condition perfect; 90 gns.—Watson, 50, Boone St., Lee, S.E. [X2732]

ENFIELD, 3 h.p., semi T.T., 1916, 2,000 miles only, overhauled throughout, electric lamps, and large accumulator, speedometer, 45 gns., or exchange with little cash for twin combination.—N. Tite, 523, Cambridge Rd., E.2. [X2600]

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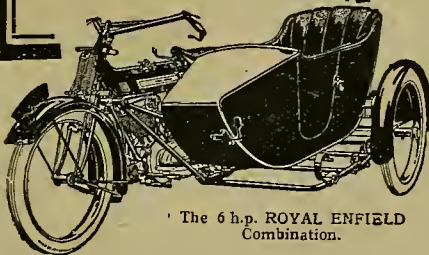
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MOTOR CYCLES FOR SALE.

Enfield.

ENFIELD 1916 6 h.p. Combination, equipped with two mechanical horns, three lamp sets, trip speedometer, folding wind screen with sides, spare tube, etc., first-class condition throughout; 90 gns.—Parker's, Bradshawgate, Bolton. [X2510]

Excelsior.

BRITISH Excelsior late 1915 Combination, 5-6 h.p., coachbuilt sidecar, lamps, speedometer, mileage 3,000, chain drive, 3 speeds, clutch, horn, wind screen; £75.—Davy, 95, Barton Rd., Dover. [X2427]

AMERICAN Excelsior, 7-9 h.p., 1916 model, dynamo lighting set, 3 speeds, and kick starter, complete with coachbuilt sidecar, hood, etc.; accept £78 cash for quick sale.—24, Grosvenor Av., East Sheen, S.W.14. [X2865]

1916 4½ h.p. British Excelsior, S.A. 3-speed gear box, coachbuilt sidecar, very little used, first-class condition; any trial; £70, a bargain; or exchange with cash for Enfield or Harley combination.—J. Yearley, 126, High St., Winsford, Cheshire. [X2880]

F.N.

2½ h.p. F.N., shaft drive, 2-speed, clutch; £16; exchange higher power.—82, York Rd., Battersea. [X2836]

5½ h.p. 4-cyl. F.N., Bosch mag., B. and B. carburettor, spring forks, 26 in. wheels, engine needs tuning; 12 gns., or best offer; or would consider push cycle part payment.—Murphy, Post Office, Blackridge, West Lothian. [X2692]

Grandex.

1914 Grandex-Precision Coachbuilt Combination, 4½ h.p., mag., 2-speed Enfield gear, handle starter, chain drive, hood, screen, lamps; cheap, 45 gns.—Wandsworth Motor Exchange, Ebner St., Wandsworth (Town Station). [X2740]

Harley-Davidson.

HARLEY-DAVIDSON, late 1915, done about 7,000 miles; £65; inspect by appointment only.—Cook, Baltic House, Slough. [X2731]

1915 Harley-Davidson Combination, electric light, and all accessories, recently overhauled.—Park, Willingham, Gainsborough. [X2235]

1917 Harley-Davidson, 7-9 h.p., Swan sidecar, hood, in perfect condition; 120 gns.—P. Driscoll, 58, Woodfield Rd., Baling, W.5. [X2824]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new Harley-Davidsons. [X2262]

HARLEY-DAVIDSON, olive green, fully equipped, special Montgomery sidecar, not done 60 miles; £142/10.—H. Walling, 182, Portland St., Southampton. [X2468]

HARLEY-DAVIDSON Combination, 1915, lamps, horn, etc., in perfect running order, excellent condition; £76/10, no offers.—Owner, 27, St. John's Rd., Putney Hill. [X2592]

HARLEY-DAVIDSON 1916 Combination, mag. model, 3 lamps, horn, tools, new Dunlop on back, also new spare cover, enamel (green) and plating as new, excellent condition; price £90.—Hawthorn House, Prospect Place, Pembroke Dock. [X2342]

Hazlewood.

1914 5-6 h.p. Hazlewood and Canelet Sidecar, perfect condition, 3-speed, free engine, Bosch mag., J.A.P. engine; £55; been stored 2 years; owner on active service.—F. Clarke, Woodlands, Stewkley, Bucks. [X2370]

Henderson.

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new Hendersons. [X2264]

10 h.p. 4-cyl. Henderson, 1916, just overhauled and painted, perfect condition; any examination; £75.—C. Jackson, 7, Myra Rd., Peirhaven, Lytham. [X2338]

Hobart.

HOBART 2-stroke, £22/10; also wicker torpedo sidecar, £12.—6, First Avenue Hotel Buildings, Holborn. [X2472]

1916 Hobart, 2½ h.p., mag.; 25 gns.—Wandsworth Motor Exchange, Ebner St., Wandsworth (Town Station). [X2741]

Humber.

HUMBER, 3½ h.p., 2 speeds, handle starter; £22; exchange.—211, Garratt Lane, Wandsworth. [X2773]

HUMBER, 2 h.p., lightweight, dainty little machine; £12; exchange.—211, Garratt Lane, Wandsworth. [X2775]

HUMBER 3½ h.p. Combination, 2-speed, F.E., coachbuilt sidecar, with all spares; £30.—6, Willow Villas, Coral Lane, Chelmsford. [X2703]

3½ h.p. Water-cooled Humber Combination, fine turn-out, 3-speed, kick start, electric light; lowest £48; any trial.—Hammond, Lutterworth. [X2691]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new 3½ h.p. and 6 h.p. flat twin Humber. [X2265]

HUMBER, 1910, 3½ h.p., Roe 2-speed, etc., excellent condition; £20, or exchange best make push bike and cash.—S., 90, Bargates, Leominster. [X2662]

HUMBER, 3½ h.p., new pattern flat twin, 3-speed coachbuilt sidecar, with lamps, horn, and speedometer, very little used; £65.—Saw Mills, Dunts Hill Rd., Farnfield, S.W. [X2708]

MOTOR CYCLES FOR SALE.

Humber.

31 h.p. Humber Motor Cycle, all plated exhibition 32 model, single-cyl., Roc 2-speed, free engine, fully equipped with speedometer, guaranteed running order; £25.—Budd, 14, Sun Lane, Blackheath, S.E.3. [X2405]

19 14 Humber, 3½ h.p., 3-speed S.A., free engine, clutch, with nearly new coachbuilt sidecar, condition perfect, just overhauled, tools, lamps, accessories; £45.—Lt. Bryant, 1, West Caroline St., Blackpool. [X2524]

19 17 6 h.p. 3-speed Humber Combination, all enclosed cush chain drive, detachable wheel, lamps, horn, speedometer, coachbuilt bulbous back, sidecar with step, apron, screen, and large luggage locker, spare tyre, tube, chains, plugs, lovely condition; bargain, £90.—Brook, 25, Newsome Rd., Huddersfield. [X2363]

Indian.

INDIAN, 1914, 7-9 h.p., 2-speed, like new; £38. bargain.—29, St. Leonard's St., Bow, E.3. (Exchange 3½ h.p.) [X2667]

FOR Sale (offer required), Indian motor cycle and sidecar, 1915 pattern, 7-9 h.p.—Rayner, 92, Bath Rd., Hounslow. [X2696]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new Indians. [X2263]

INDIAN 1915 7 h.p. Road Racer, free engine, exceptional condition; £40.—Thom, 32, Second Ave., Selly Park, Birmingham. [X2723]

INDIAN Motor Cycle for sale, £70, 1915, 7 h.p., unused since July, 1916; seen appointment only.—Dr. Spreut, Whetstone, N.20. [X2672]

19 15 Indian Combination, practically new, needs few adjustments, been stored 2½ years; £75.—Capt. Clarke, Binbrook, Lincoln. [X2473]

INDIAN, 5-6 h.p., free engine, re-enamelled, good going order; £17/10, or exchange lower power.—F. Wilson, Swanlow, Winsford, Cheshire. [X2500]

INDIAN, 1915, 7-9 h.p., clutch model, in perfect condition, lamps, horn, etc.; £55.—Russell, Victoria, Alexandra Rd., Farnborough, Hants. [X2638]

INDIAN Motor Cycle, 1915, single gear, free engine clutch, 7-9 h.p. Model D.; £45; condition new; first cheque secures.—Mastelow, Cowleigh Rd., Malvern. [X2664]

INDIAN, 1915 Model D., clutch, P. and H. lamp set, Stewart horn, just been overhauled, tyres good; seen any time; £35.—14, Ewer St., Gravel Lane, S.E.1. [X2685]

19 16 Indian, 5-6 h.p., 3 speeds, K.S. lamps, mechanical horn, tools, good condition; first cheque for £60 secures same.—Waddell, Bilsington, Ashford, Kent. [X2755]

19 14 Indian, 7-9 h.p., spring frame, 2 speeds, clutch, electric lamp, speedometer, in excellent condition; £65.—P. Driscoll, 58, Woodfield Rd., Ealing, W.5. [X2825]

19 16 Powerplus Indian Coachbuilt Combination, 3-speed, hand-foot clutch, T.T. bars, lamps, mechanical horn, tyres, nearly new; 74 gns.—Fox, 600, Fulham Rd., S.W.6. [X2746]

INDIAN, 1912, 5-6 h.p., with coachbuilt sidecar; any trial and inspection; complete with lamps and generator; £30; seen by appointment.—Stapleton, Grosvenor Rd., Highbury, N. [X2759]

19 15 Beautiful Red Indian, clutch model, 7-9 h.p., twin, mag., head lamp, overhauled, very fast; 45 gns.; exchanges.—Wandsworth Motor Exchange, Esher St., Wandsworth (Town Station). [X2742]

INDIAN, 1915 (June), 5-6 h.p., 3 speeds, foot clutch, kick starter, P.H. lamp (unlit), engine, chains, gears, plating perfect, unused two years; £55.—Kirby, Newtown Rd., Warsash, Hants. [X2345]

19 15 7-9 h.p. Indian Powerplus, kick-start, clutch, 3-speed, Dnlops, with sporting coachbuilt sidecar, 3 lamps, Klaxon, tools, engine very fast, in excellent order; £75.—Robinson's Garage, Green St., Cambridge. [X2899]

19 16 Indian 7-9 h.p. Powerplus Spring Frame Combination, absolutely as new, and almost unscratched, dynamo lighting, electric horn, speedometer, all usual accessories, not done 500 miles; accept £90, as immediate sale necessary.—98, Tulse Hill, S.W.2. [X2891]

INDIAN, 1915, 7-9 h.p., racing model, clutch, Auto-clutch lamps, generator, Binks Indian carburettor, red, X'ball saddle, knee-grips, tyres, enamel, and plating excellent 80 m.p.g., and 70 m.p.h., just overhauled; £50, or close offer.—Write, Bramwell, Southolme, Byfleet, Surrey. [X2721]

James.

JAMES, 3½ h.p., free engine, B. and B., Bosch mag., tyres, engine in splendid condition; £30, close offer.—7, Wastdale Rd., Forest Hill. [X2766]

19 17 James, 5-6 h.p., twin, 3-speed, lamps, horn, very good condition; £85.—Elce, and Co., 15-16, Bishopsgate Av., Cammille St., E.C.3. [X0481]

JAMES 5-6 h.p. Combination, run 300 miles, electric light, mechanical horn, unscratched; consider solo in part exchange.—Owner, 44, Chatham St., Derby. [X2796]

JAMES 1919 Models promised this month early; also actually in stock, 1917 3½ h.p. twin, semi T.T. bars, all accessories, £82/10; exchanges arranged.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [X2656]

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15-20 h.p. CHARRON Limousine	£150
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12-14 h.p. BELSIE 5-seater	£175
14-16 h.p. DARRACQ Lorry	£45
10-12 h.p. SWIFT 2-seater	£20
6 h.p. DE DION 2-seater	£10
20 h.p. 1915 STUDEBAKER	£175
25-35 h.p. 1912 NAPIER Landauet	£40
15-20 h.p. CHENARD Coupé	£85
12 h.p. VINOT light Landauet	£150
25 h.p. MILNES-DAIMLER 3 ton Chassis	£150
25 h.p. DE DION 3-4 ton Lorry	£200
25 h.p. DE DION Motor 'Bus, double deck	£200

ACCESSORIES.

New Side Lamps, black and brass, per pair	£2 2
New Tail Lamps, black and brass, each	10/-
New Columbia Voltmeters, 6-volt,	7/6
New Electric Horns	10/-, 15/-
New Brass Horns, double twist	12/6
New Master Sparking Plugs	4/-
New Light Car Jacks	6/6

MAGNETOS.

S.T.H., 4-cylinder, waterproof, as new	£10 10
BOSCH D.R.8, for 4-cylinder, as new	£8 10
BERLING, waterproof, as new	£9 0
DIXEY, waterproof, Type 80, equally suitable for 4 or 8 cylinder	£6 10

MACHINE TOOLS.

6in., 8in., 8½in., 9½in., 10in., 10½in. Sliding, Surfacing, and Screw-cutting Lathes, from	£40
12in. and 16in. Sensitive Drilling Machines, from	£12 10
Several Horizontal Milling Machines, from	£50
Shaping, Slotting, Boring, Profiling, Thread Milling, Screwing and Tapping, Grinding, Sawing, and Cutting-off Machines at low prices	£50 to £150
6in., 8in., 9in., and 12in. Capstan and Turret Lathes, about 20 available, at from	£35 to £350

Write for Catalogue of over 100 Machine Tools.

F.I.A.T. (Second-hand Cars).

12-14 h.p. 4-seater	£160
12-14 h.p. London Taxicab	£150
12-14 h.p. light Landauettes	£175, £200, £225

Above all with new tyres.

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Special Bargain for

MOTOR ENGINEERS.

1 cwt. new bright Steel Hex. Bolts, Studs, Nuts Pins, Screws etc., Whitworth, B.S.F., Metric, B.A. threads, about 2,000 new pieces, sent carriage paid for £5.

Sample Parcel, post free, 10/-.

1,000 Gear Blanks, 6 x 1in., 3 x 1in., 3½ x 1in., 4 x 1in., 5 x 1in., all 2 or 2½ in. diameter bolts 1/6 per lb.

Write for Catalogue of 5,000,000 Nuts, Bolts, and Engineers' Essentials, post free.

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183-199, High St., Tooting, London, S.W.

Phone: 203, Streatham.

Grams: "Palmer's Garage, Tooting"

MOTOR CYCLES FOR SALE.

James.

19 16 James Combination, 4½ h.p., 3 speeds, lamps, Mec. horn, etc., mileage about 1,000, the turnout as new; £75, or near offer.—Jenkins, 4, Glamorgan Terrace, Swansea. [X2242]

RIDER TROWARD and Co., 31, High St., Hampstead.—James machines. Delivery this month new 5-6 h.p. twin combination, £126; 4½ h.p. solo, 85 gns.; combination, 104 gns.; delivery February, 3½ h.p. twin, 85 gns.; March, 2½ h.p. 2-stroke. Orders accepted in strict rotation. [X2267]

Kerry

KERRY-ABINGDON, with coachbuilt sidecar, in good running order, lamps, accessories; £40.—Ness, Gas Works, Sandy. [X2437]

Levis.

LEVIS.—Order now for earliest deliveries of 1919 models.—Longman, Fisherton St., Salisbury. [X2558]

LEVIS 1915 Popular, ready to ride away; £22.—Sgt. Stevens, R.A.F., Racecourse, Manchester. [X2706]

LEVIS Popular, 2½ h.p., perfect condition; £23/10; owner on active service.—F. Clarke, Woodlands, Stewkley, Bucks. [X2371]

LEVIS, 2½ h.p., 2-stroke, single-speed, lamps, horn, tyres, in good condition; £20, or near offer.—4, First Cross Rd., Twickenham. [X2845]

LEVIS, 2½ h.p., single-gear, belt, 1914, new condition, perfect, not been 500 miles; £27.—Mastelow, Cowleigh Rd., Malvern. [X2663]

RIDER TROWARD and Co., 31, High St., Hampstead.—Levis. Delivery this month, Model E, 2-speed, clutch, £47/10; Popular, £38. Orders being booked in strict rotation. [X2268]

LEVIS.—For the earliest possible delivery of 1919 models, advance specifications of all models, sole district agents, The Walsall Garage, Wolverhampton St., Walsall. Phone: 444. [X0127]

LEVIS, 1915, 2½ h.p., complete, tools, lamps, horn, nearly new tyres and belt, splendid condition; any examination and trial here; £26.—Lieut. Wroughton, Aerodrome, Weston-on-the-Green, Oxon. [X2400]

LEVIS Model E., 2-speed, £47/10; actually here; and 1916 Popular, semi T.T. bars, £29/10; also 1915 Popular, £27/10; exchanges arranged.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [X2652]

LEVIS, Levis, Levis.—A limited number of Popular and 2-speed Model E. for guaranteed early delivery. If you are interested in 2-strokes motor cycles, call and see us. Sole wholesale agents for London district.—Cars and Motor Sundries, Ltd., 24, Woodstock St. (off Oxford St.), Bond St., London, W.1. (Always open.) [X0979]

19 15 Baby Levis, 2½ h.p.; this machine is like new, fitted with disc wheels, knee-grips, racing bars, fully equipped, head lamps, pump, horn, etc., just received from makers after a thorough overhaul and engine tuned up for speed, Sensapry, and C.A.V., Clincher de Luxe; to see is to buy; £28/10; equal to new, 3 months old.—19, Wilcox Rd., South Lambeth, London, S.W.8. [X2782]

Martin.

MARTIN-J.A.P., 23½ h.p., overhead valves, low, smart, racy, specially tuned, excellent condition throughout; want combination; £22.—Haylett, 8, Milner St., Islington, London, N.1. [X2754]

Matchless

MATCHLESS, early deliveries.—Sole Agent, J. A. Stacey, 12, Ecclesall Rd., Sheffield. [X1544]

MATCHLESS, 8 h.p., J.A.P. engine, Swan de Luxe coachbuilt sidecar.—245, Hammersmith Rd., W.6. [X2648]

MATCHLESS Combination, 1918, dynamo lighting; £120.—51, Maplethorpe Rd., Thornton Heath, S.E. [X2790]

CROW Bros., High St., Guildford, West Surrey agents for the 1919 Matchless. Order now to ensure early delivery. [X1552]

MATCHLESS.—Delivery from stock. latest 8 h.p. combination with spare wheel; £140.—Parker's, Broadshawgate, Bolton. [X2506]

RIDER TROWARD and Co., 31, High St., Hampstead.—Matchless. Earliest delivery Victory model combination, £140. [X2269]

MATCHLESS Victory Combination, unused, hood, screen, apron, lamps; £145.—Ware, 11, Rochester Terrace, Camden Rd., N.W.1. [X2817]

MATCHLESS 8B2, 1915-16, M.A.G., Lucas dynamo lighting, hood, screen, spare wheel re-enamelled; £125.—Box L8,733, c/o The Motor Cycle. [X2894]

8 h.p. Matchless and Sidecar, 2-speed, stored duration war, otherwise new condition; genuine opportunity; £50.—8, Lithos Rd., South Hampstead. [X2711]

MATCHLESS, 1912, 4 h.p., 2 speeds, free engine, J.A.P., accessories, good condition, ready ride away; £25.—Brawn, 94, High St., Beckenham. [X2576]

19 14 8 h.p. Matchless Combination, J.A.P. engine, 2-speed, kick start, coachbuilt sidecar, in new condition; any trial; £65.—188, Parrack St., Gravesend. [X2761]

MATCHLESS Victory Model Combination actually in stock, with spare wheel and tyre; £140; seen by appointment.—J. Tussell, 1a, Bloomfield Rd., Plumstead, S.E.18. [X1606]

MOTOR CYCLES FOR SALE.

Zenith.

ZENITH, 6h.p., T.T., new tyres, 38 gns.; wanted, rear cylinder and piston, for 1914 5h.p. Enfield; after 6 p.m.—14, College Court, Hammersmith Broadway. [2688]

ZENITH, 1915, 4h.p. J.A.P., Gradua countershaft gear, lamps, tools, spares, with torpedo cane sidecar; bargain, in first-class order, 42 gns.—Judge, Sudbury, Suffolk. [2679]

Ladies' Motor Cycles.

1915 Lady's Douglas, 3-speed, clutch, perfect order; £45.—Box 2,709, c/o The Motor Cycle. [X2498]

LADY'S Douglas, 2-speed, kick starter (small part missing), believed 1913, little used, new tyres and belt, lamps; accept £30 for quick sale; trial in London.—Box L8,731, c/o The Motor Cycle. [2692]

Miscellaneous.

RUDGE, 1912, 3½h.p., 2-speed, lamps, horn, new tyres, £24.

B.S.A., 1912, 3½h.p., clutch, Bosch mag., lamps, horn; £24.

DOUGLAS, 1913, 2½h.p., 2-speed, T.T., lamps, horn, new tyres; £30.—Apply, 7a, The Mall, Sudbury Town, Middlesex. [2550]

JONES' Garage.—1919 Victory Model Matchless, spare wheel, all wheels detachable and interchangeable.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1919 New Imperial Combinations, 8h.p., splendid outfits; £126.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1919 Model K B.S.A.; £79/16.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1919 Model H B.S.A.; £81/18.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1919 3-speed Rover, 3½h.p.; £97/10.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1919 T.T. Rover, fitted with Philipson pulley; £85/15.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1919 3-speed Ariel, 3½h.p.; £80.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1919 New Imperial Lightweight, 2-speed; 48 gns.—Broadway, Muswell Hill, N.10.

ALL the Above are actually in stock at Jones Garage, Broadway, Muswell Hill, N.10.

JONES' Garage.—Will have all other makes as soon as they are being supplied by the makers.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1916 3h.p. T.T. Enfield, 2-speed, as new; £55.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1916 A.J.S. Combination, in very good order; £30.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1914 Calthorpe-Jap, 2-speed; £32.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1914 3½h.p. Zenith-Gradua, in fine order; £45.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1915 Clyno, 2-stroke, 2-speed, as new; £35.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1914 Kerry-Abingdon, 3½h.p., 2-speed, in fine order; £35.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1914 4½h.p. Torpedo-Precision, not done 200 miles, 3-speed, kick start, all lamps, horn, coachbuilt sidecar, absolutely indistinguishable from new; £50.—The Broadway, Muswell Hill, N.10.

JONES' Garage.—1916 Enfield combination, 6h.p., hood, screen, speedometer, lamps, etc., not done 1,000 miles, been standing 2 years, quite as good a proposition as a new machine; £95.—The Broadway, Muswell Hill, N.10.

JONES' Garage.—1916 Abingdon King Dick, as new; £50.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1917 3½h.p. twin James, 3-speed, as new; £75.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1914 Triumph, 3-speed, in fine order; £50.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1914 Triumph, 3-speed, and coachbuilt sidecar; £56.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1914 T.T. Triumph, in fine order; £43.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1914 Triumph, 3-speed, as new; £56.—Broadway, Muswell Hill, N.10.

JONES' Garage.—Rudge Multi, indistinguishable from new; makers' guarantee given; £75.—Broadway, Muswell Hill, N.10.

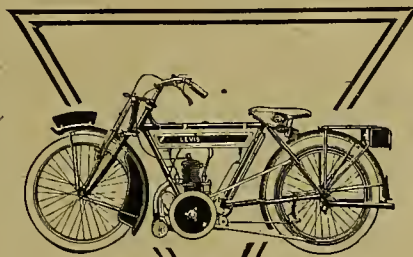
JONES' Garage.—Rudge Multi, absolutely as new; makers' guarantee given; £72.—Broadway, Muswell Hill, N.10.

JONES' Garage.—Rudge Multi, demonstration model, as new; makers' guarantee given; £69.—Broadway, Muswell Hill, N.10.

JONES' Garage.—Short 'bus ride from Finsbury Park or Highgate Tube Station.

JONES' Garage will be pleased to forward lists and further particulars of any machine or machines upon request.—Broadway, Muswell Hill, N.10.

JONES' Garage supply on the deferred payment system.—Broadway, Muswell Hill, N.10. [2553]



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MOTOR CYCLES FOR SALE.

Miscellaneous.

LATE Model Motor Cycle, 2-speed gear, less engine; 8 gns.—232, Brixton Rd., S.W.9. [2806]

1916 2½h.p. Popular Levis, 21 gns.; also 1911 Douglas, speedometer, etc., £15, or nearest; after 6.—25, Woodberry Grove, N.4. [2687]

THE H.C. Motor Co., 347, Finchley Rd., have the following machines for sale, all guaranteed to be in perfect running order, cash or exchanges:

SUN, 1915, 2-speed, 2-stroke, B. and B., Villiers engine; 26 gns. (13)

PREMIER, 1913, 3-speed, clutch, splendid condition; 23 gns. (18)

VELOCETTE, 1915, dropped frame, 2-stroke, 2-speed, U.H. mag., Seuspray carburetter, all chain drive; 24 gns. (19)

PREMIER, 1914, 2½h.p., clutch model, Bosch mag., in fine condition; 27 gns. (30)

CALTHORPE J.A.P., 1915, 2½h.p., 2-speed, Enfield gear, just been re-enamelled; 28 gns. (36)

B.S.A., 1918, 4h.p., chain-cum-belt, just delivered from works; £79/16. (50)

B.S.A., 1916, 4½h.p., 3-speed countershaft, in splendid condition; 59 gns. (62)

HUMBER, 1914, 2½h.p. twin, 3-speed, in fine condition, just overhauled; 30 gns. (58)

PRECISION, 3½h.p., Bosch, B. and B., single speed, guaranteed; 17 gns. (59)

SINGER, 1914, 3½h.p., 2-speed countershaft, dropped frame, perfect condition; 35 gns. (61)

SUNBEAM Combination, 1915, 6h.p., De Luxe sidecar, light car tyres, in perfect condition throughout, and as new; 105 gns. (65)

TRIUMPH, 1913, 3½h.p., clutch model, in fine condition; Bosch; 29 gns. (53)

WOLF, 2½h.p., 2-stroke, single speed, 1917, shop-soiled only; 27 gns. (66)

SUN-V.T.S., 2-speed, 2-stroke, 1918, run 10 miles only, as new; 37 gns. (68)

THE H.C. Motor Co., 347, Finchley Rd., N.W.3. Phone: Hampstead 4631. Open Saturday afternoons and Sundays. [1673]

ROVER, 1915, 3 speeds, clutch, guaranteed, equal to new, £47/10; Fulford 1917 £15/15 sidecar, £10/10; 1918 B.S.A. carburetter, £2/10.—R. Sinden, 5, Victoria Av., Surbiton. [2835]

WALL Auto-Wheel, with lady-back tandem, £12/10, Auto-Wheel £7, Rex twin, 5-h.p., low, fast, £10; Alldays 2½h.p., £7/10, complete; both magneto just overhauled and guaranteed; old machines, but not duds; bargains.—Harper, 2, Argyle St., Oxford. [X2436]

CASH Bargains.—New 4h.p. 3-speed Douglas combination, £95; new 2½h.p. War Office Douglas, £60; new 1919 4h.p. countershaft Triumph, £87; 1913 (Sept.) 2½h.p. Douglas, £32/10; 1916 6h.p. Enfield combination, £85; 1912 6h.p. Enfield combination, £35; 3½h.p. 2-speed N.S.U., £19/10; 1914 6h.p. 2-speed Rex, wants attention, £32/10; 3½h.p. 2-speed P. and M. and underslung sidecar, £29/10; 2½h.p. 3-speed Rex, 1915 Calthorpe Minor light car, £200.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [2885]

SIDECAR ATTACHMENTS.

RENNOC Sidecars are manufactured at the Rennoc Motor Sidecar and Engineering Works, 86, Victoria Rd., Stroud Green, London, N.4.

RENNOC Sidecars are designed and manufactured under the personal supervision of Mr. George Conner.

RENNOC Sidecars.—We supply lugs, rims, spokes, upholstery material, tubing, springs, and all fittings for any make sidecar.

RENNOC Sidecar Bodies, hoods, screens, wheel discs, etc., actual manufacturers, wholesale, retail, and export.

RENNOC Sidecars.—We specialise in frame repairs to motor cycle and sidecars.

RENNOC Sidecars.—Special department for sidecar body repairs, repainting, upholstery, lining, etc.

PHENIX Sidecars.—The Rennoc Co. can supply all spares and undertake repairs for this make.

RENNOC Sidecars.—14 models to fit all motors; tandems a speciality.

RENNOC Sidecars.—We can give immediate delivery of all models.

RENNOC Sidecars to suit Harley, Yale, Indian, Excelsior, Pope, and all American models.

RENNOC Sidecars specialise in motor cycle and sidecar frame repairs, enamelling and plating.

RENNOC Sidecars are actual manufacturers of hoods, screens, and wheel discs.

RENNOC Sidecars have always in stock second-hand and clearance sidecars; special list.

RENNOC Sidecars have in stock 17 different design bodies to suit old and new pattern chassis.

RENNOC Sidecars advise you to place your present sidecar with us to be overhauled, we have a special department.

RENNOC Sidecar Works, 86, Victoria Rd., Tootington Park, Stroud Green, London, N.4. [2828]

SIDE CAR ATTACHMENTS.

BASTONES' for Sidecars at low prices.—228, Pentonville Rd., King's Cross, London, N.1. [2779]

COACHBUILT Sidecars—Book your orders now for new patterns.—245, Hammersmith Rd., W.6. [2649]

RIDER TROWARD and Co., 31, High St., Hampstead, have always several good second-hand sidecars for sale. Also agents for the Headerson. [2903]

SIDECARS and Chassis, touring, tradesmen's, and sporting models; good variety; deliveries from stock.—Burbury Sidecar Works, Farm St., Birmingham. [2544]

2-SEATER Sidecar (Millford tandem), red, suitable for Indian, wind screen, hood, side curtains, hood cover; for sale, or would exchange for single-seater.—Andrew, Greenmount, Norbury Av., S.W.16. [X2404]

G.K. Sidecar Co.—Phone us, Holborn 933, for quotation for repairing or renovating your sidecar. Sidecars in stock. Hoods, screens, aprons, etc. Reasonable charges.—336, Gray's Ina Rd., W.C.1. [2207]

SIDECAR, brand new, Phoenix latest underslung coachbuilt model, beautifully upholstered, coverall apron, Matchless colour, 4-point suspension, no tyre; best offer secures; after 7.—Perry, 3, Lushington Rd., Harlesden. [2701]

TURNER'S Sidecar Body, reg. design, screen, fittings, and hood, good condition, £7; Premier wicker sidecar, No. 2 complete with couplings, tyre good, £4/10; chassis, less couplings, wheel and springs, £3.—Creasey, Institution, Talgarth. [X2467]

BODIES.

WICKER Sidecar Body, 30/-, P.O. for size and sketch.—Ingleboro', Pinewood Rd., Swansea. [X2465]

50 Trailer Bodies, wicker and cane; bargain prices, from 7/6 each to clear.—Burbury Sidecar Works, Farm St., Birmingham. [2304]

CANE Sidecar Bodies, several to clear at 50/- each, worth £75; also several juvenile bodies; write for design.—The Willowbrook Co., Leicester. [0901]

BASTONES' for Sidecar Bodies.—Several light wicker and coachbuilt bodies; also tandem and torpedo bodies at clearance prices.—228, Pentonville Rd., King's Cross, London, N.1. [2780]

SIDECAR Body Designs for the trade only. Working, coloured, pencil, or line drawings of original designs, also working drawings full sized or to scale.—Coopers Vehicle Journal, Ltd., established designers to the coach trade for over 80 years. Consult us when designing new ideas.—20, Tudor St., London, E.C.4. [0618]

HOODS, WIND SCREENS, ETC.

ENFIELD Hood and Screen, complete, perfect, £4.—Seymour, 6, Ringstead Rd., Catford, S.E. [2881]

RUNABOUTS AND CYCLE CARS.

2-SEATER Light Motor, Pope, single-cyl., running order; what offers?—21, Breat St., Hendon, N.W.4. [X2422]

GRAND Prix Morgan, 1915, tremendously fast, £125.—29a, Electric Av., Brixton Rd., S.W.9. [2809]

MORGAN, latest De Luxe model, run few weeks only, indistinguishable from new; offers.—Parker's, Bradshawgate, Bolton. [X2511]

ABOLISH Waiting Lists and "get on the road." Our advertisement under Miscellaneous shows you how.—Gibbons Cycle Car Company. [2844]

RIDER TROWARD and Co., 31, High St., Hampstead, have always several good cycle cars in stock, Morgans, G.N.'s, Cardens, and others. [2904]

MORGAN, 1914, a.c. J.A.P., hood, screen, lamps, speedometer, paint new condition, oversize tyres; £85; exchange.—24, Beaulieu Rd., East Dulwich. [2799]

MORGAN, 1914 sporting, a.c., red, hood, screen, lamps, speedometer, disc wheels, perfect; £80, or exchange Enfield combination.—35, Clerkenwell Close, E.C. [2754]

CYCLE Car, single-seater, streamline body, belt drive, 2-speed countershaft gear, handle starting, ready for moit and tyres; £10.—26, Annesley Av., Hendon, N.W.9. [X2499]

PHOENIX Smart 2-seater, 10h.p. (water-cooled), mag., 3 speeds, reverse, hood, screen, 5 lamps, speedometer; Stepney, watch, plated fittings; open to any examination and trial; great bargain, only 95 gns.; take combination put payment.—Wandsworth Motor Exchange, Ebury St., Wandsworth (Towu Station). [2737]

8 h.p. 1916 Grand Prix W.G. J.A.P.-engineed Morgan, a special radiator, and running boards and petrol carrier, disc wheels, accumulator electric lighting, 3 oil lamps, and full kit tools, one brand new Dunlop combination rubber and steel tyre on back, and brand new Avon spare cover, also spare chain; engine, gears and chains, and appearance excellent; price £147.—Scholes, "Bunsides," Lightwood Rd., Buxton. (D) [X2512]

CARS FOR SALE.

DARRACQ Open Touring Car, 1910 model; £75.—232, Brixton Rd., S.W.9. [2811]

JONES' Garage—1914 G.W.K., all lamps, hood, screen, absolutely in fine condition; £140; guaranteed perfect.—The Broadway, Muswell Hill, N.10. [2900]

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NEW IMPERIAL LIGHTWEIGHTS.

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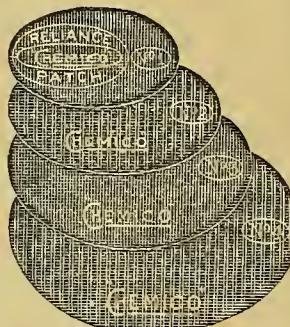
ROVERS, T.T. MODELS, WITH PHILIPSON PULLEY.

(See Miscellaneous Motor Cycles.)

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SUNBEAM Car, 12-18h.p., little used, in perfect running order; £300.—Mrs. Fect, 10, Thorbury Av., Clapham Park, S.W. [2810]

CALTHORPE Minor 1916 Sports 3-seater, 90h.p. Prince Henry Mercedes, 90h.p. Grand Prix, Italia 1914; part exchange agreeable.—Railway Garage, Staines. [2875]

22 h.p. S.C.A.T. Cabriolet, late model, in perfect order, only run 9,000 miles, indistinguishable from new; £400, near offer, or high-class piano considered part.—Box 2,696, c/o The Motor Cycle. [X2328]

1913 (late) Swift 2-seater, 10-12h.p., 2-cyl., engine rebushed, 3-speed, reverse, complete with hood, screen, speedometer, 5 lamps, spare wheel, heavy Michelin tyres, perfect condition throughout, smart appearance; £60, a bargain.—Brown, Waterworks, Fradley, Lichfield, Staffs. [X2488]

HIGH-POWERED and Sporting Cars.—In stock, 90 h.p. Mercedes, 225 gns.; 80h.p. Berliet, 325 gns.; 30h.p. Napier, 295 gns.; 30h.p. Gregoire, 295 gns.; 45h.p. Mercedes, 325 gns.; 35h.p. Mercedes, 155 gns.; 50h.p. P.I.A.T. chassis, 155 gns.; 15.5h.p. Straker-Squire, 250 gns.; and others; motor cycles or other cars taken in part.—Rider Troward and Co., 31, High St., Hampstead. [2905]

DEMOLIBISATION Bargains! And such bargain! Remember some of the cars almost new, and all dates advertised here, run at speed accurate—10h.p. Unique parcels lorry, modern, light car type, pointed radiators, wire wheels, worth double, £45; 10h.p. Darracq 2-seater, detachable wire wheels, spare, dickey seat, bargain, £65; 15h.p. Charron chassis, 4-cyl. monobloc, Solex, worth double, £65; 12-16h.p. Moto-bloc chassis, unit engine construction, light, sporty chassis, £75; 14-16h.p. Darracq traveller's omnibus, smart roomy body, chassis specially reconstructed, 4-cyl. monobloc, Zenith, gate, worth double, £80; 15.9h.p. 1914 R.C.H. torpedo, monobloc, enclosed valves, detachables, centre gate, nice little 4-seater, £80; 12-15 h.p. Star 2-seater, gate, Zenith, £90; 30h.p. National (U.S.A.), sporting 4-seater, fast car, £100; 38h.p. Daimler chassis, £100; 2-ton Berliet chassis, twin solids, all gears new, wants slight adjustments, worth treble, to clear £100; Thames bungalow plot at Sunbury, £100 freehold; 8-10h.p. Renault platform lorry, 8ft.x5½ft., most economical, £115; 15h.p. Bayard 1-ton van, twin solids, roomy body, £115; 15-20h.p. Panhard live axle chassis, £120; 8-10h.p. 1914 sports model Humber streamline 2-seater, disc wheels, 40 m.p.g., £120; 40h.p. 6-cyl. Acme (U.S.A.) sporting 4-seater, special competition car, real snip, £125; 12-15h.p. F.I.A.T. taxilaundlet, monobloc engine, enclosed valves, £125; 12-14h.p. Renault landaulet, £130; 10-12h.p. Le Gui semi-sporting 2-seater, 4-cyl. engine, Zenith, £135; 18h.p. 1915 Maxwell streamline 4-seater, monobloc, enclosed valves, centre gate, Bosch mag., £135; 2-ton Milnes-Daimler heavy commercial, twin solids, live axle, Zenith, H.T. mag., £145; 10h.p. A.C. light car, streamline 2-seater, 4-cyl. monobloc, enclosed valves, pointed radiator, wire wheels, domed mudguards, £185; 3-ton Straker-Squire lorry, cab front, H.T. mag., Zenith, all new tyres, aluminium radiator, twin solids, bargain, £235; 1914 Palladium 1-ton van, solids all round, monobloc engine, enclosed valves, £245; 16-20h.p. Sunbeam chassis, enclosed valves, detachable wheels, 4-speed, Claudel, £250; 40h.p. Wolseley chassis, enclosed valves, detachable wire wheels, extra long wheelbase, price overhauled £250; 20h.p. Crossley torpedo, monobloc unit construction, detachable wheels, Zenith, £265; 13.9h.p. 1914 B.S.A. 2-seater, Knight engine, worm drive, detachable wheels, £285; 3-ton De Dion commercial chassis, latest round radiator type, worm drive, enclosed valves, twin solids, steel wheels, £350; another exactly similar, better condition, £355; ditto 3-ton De Dion lorry, complete, roomy body, high sides, £425; 2-ton Napier W.D. type lorry, worm drive, aluminium radiator, enclosed valves, steel wheels, twin solids, bargain, £575; 4-ton late 1915 Garner lorry, cab front, enclosed valves, twin solids, very little used indeed, real bargain, £650; 24-30h.p. 6-cyl. Wolseley limousine-landaulet, enclosed valves, extra long wheelbase, detachable wire wheels, £650.—Cox (below).

DOUGLAS S. COX, the absolutely straight motor man, 6a, Lansdowne Hill, West Norwood, S.E., has all the above actually in stock and on view. Please call. Hours 8 to 6.30, including Saturdays; no business Sundays. Established 1902. [2248]

LORRIES FOR SALE.

4 3- and 2-ton Lorries, dozen absolute bargains, £100 to £650. See long advertisement under Miscellaneous Cars.—Cox, West Norwood. [2249]

ENGINES.

2 h.p. Inclined Minerva Engine, 55/-; Douglas frame 4 wanted.—Robinson, Sandy, Bedfordshire. [2771]

8 h.p. J.A.P. Engine, Bosch, Senspray complete, Gloria coachbuilt sidecar; what offers?—9, Arcade, Exeter. [X2354]

6 h.p. Rex Twin Engine, w.c., with radiator, excellent condition; £6/10.—Howes, 122, Macoma Rd., Plumstead, S.E.18. [2666]

8 h.p. Darracq Engine, in good order, with pump, water and petrol tanks; £8/10; suit boat.—143, Lansdowne Rd., Tottenham. [2841]

10 h.p. J.A.P. 1,000cc. W.O. 50° Engine, latest model, induction, water and exhaust pipes, Bosch magneto, drive and case, Chater plate clutch, Chater 3-speed gear, all new; £57/10.—Teviot, Longbridge Rd., Barking. [2093]

ENGINES.

PRECISION Engine, $4\frac{1}{4}$ h.p., with mag. and carburettor, nearly new; £18; approval against cash.—Bradwell, Sandgate Rd., Folkestone. [2643]

6 h.p. Sorela, perfect running order. U.H. mag., complete, £7; also wheels and tyres, 26x2 $\frac{1}{2}$, tank, carrier, stand, new Pedley belt, Brooks B100, tank and front rim slight damage, £2/10.—30, Terrace Rd., Well St., South Hackney. [2680]

5 h.p. Type B. Engine, for A.C. Sociable, fitted new Amac carburettor and new magneto, guaranteed perfect working order, and as new, except £13/10; also 6 h.p. water-cooled single-cyl. Humber engine, in good order, with carburettor and coil, battery, etc., suit cycle car, £9/10.—James Pollard, Wragby, Lincoln. [X2373]

IGNITION APPLIANCES.

TWO New B.L.I.C. Magnets, 180°, R.H., suit 8 h.p.; £7/10 each.—W. Hayward, Rainham, Kent. [2611]

SPLITDRIVE Magneto, 50°, twin, anti-clock, Model EV, as new; £4/4.—Burnup, 34, Gt. St. Helens, E.C.3. [X2490]

JEBRON, registered 291.298, greatly superior to platinum, unequalled for blades, screws, etc.; cures misfiring; 5/- each rivet; Jebron screws, fit Bosch magnets, 11/- pair; old screws Jebronised, 5/- each.

JEBRON Contacts, used by Messrs. Collier Bros., Colver, Martin, making world's records.—Jebron 38, Herbert Rd., Woolwich, London, S.E.18. [X4331]

CHARLES PARKER and Co., Magneto Specialists, undertake to repair and despatch any and every magneto received by them in 24 hours, and guarantee their job for 12 months.—Below.

CHARLES PARKER and Co. have a special department for motor cycle magneto repairs, and assure you of instant attention.—Below.

CHARLES PARKER and Co. are making a special feature of speed in completing their transactions.—Below.

CHARLES PARKER and Co. always have a reserve force of mechanics awaiting that urgent job.—Below.

CHARLES PARKER and Co., Magneto Specialists, 75, Park Rd. North, Acton, London, W.3. Tel.: Chiswick 1518. [2095]

FOR Magneto Repairs, spares, re-magnetising, British magnets and dynamo lighting equipments, write or 'phone Streatham 2108. Established 1900.—Love and Bros., Crescent Magneto Works, Norbury, London, S.W. [8075]

MAGNETO Repairs.—Send your magneto to Palmer's Garage, Tooting. Reply paid: quotation telegraphed on receipt. Quick, efficient repair guaranteed in from 2 to 6 days, usually within 24 hours.—Palmer's Garage, Tooting. [9980]

BIRMINGHAM—Magneto repairs, rewinding, re-magnetising, and overhauling promptly executed; moderate charges.—The Electrical Trades Supply Ltd., 41, Gt. Charles St., Birmingham. T.A.: Motors, Birmingham. Tel.: No. 1601 Central. [1721]

THE Magneto Repairing and Winding Co., Established 1912. Manager S. T. Boon, late from the Bosch works.—Magneto repairs of every description. All repairs at lowest possible prices, and strictly guaranteed. We can mostly return them within 24 hours. We have several new and second-hand single and 2-cyl. magnets in stock, all guaranteed.—The Magneto Repairing and Winding Co., 138, Seymour St., Euston, N.W.1. 'Phone: Museum 1158. T.A.: Kungeneh, Norwest, London. [1032]

BELTS.

DUNLOP Belt, 7 ft. x $\frac{3}{4}$ in., brand new; 7/6.—Lieut. Hewin, Brompton Barracks, Chatham. [2680]

TYRES.

ECONOMIC Tyre Co.—Please note new address, 314, New Cross Rd., New Cross, S.E.14.

ECONOMIC—We have the following clearance lines in Kempshall and other well-known makes; goods carriage paid on approval against remittance.

ECONOMIC—24x2 $\frac{1}{2}$ heavy non-skid, for 2-strokes, 32/6, listed 45/6; complete with tube, 39/.

ECONOMIC—26x2 $\frac{1}{2}$ wired-on fluted covers, 7/6, pair 12/6; only a few left.

ECONOMIC—26x2 $\frac{1}{2}$ extra heavy non-skid for 2 $\frac{1}{2}$ in. rims 41/-, listed 60/3.

ECONOMIC—26x2 $\frac{1}{2}$ diamond studded, 41/6; non-skids, 35/-; 650x65 diamond studded, 46/3.

ECONOMIC—650x65 extra heavy non-skids, 45/-, listed 65/-; 28x3 extra heavy, 50/-, listed 69/9.

ECONOMIC—26x3 Kempshall non-skid, 75/-, listed 96/-; 26x3 anti-skid, 45/-, listed 72/6.

ECONOMIC—Guaranteed tubes, 24x2 $\frac{1}{2}$ 7/6, 26x2 $\frac{1}{2}$ 7/6, 26x2 $\frac{1}{2}$ 8/6, 26x2 $\frac{1}{2}$ 8/6, 26x3 11/6, 28x3 11/6.

ECONOMIC Tyre Co., 314, New Cross Rd., New Cross, S.E.14. 'Phone: New Cross 1393. [2826]

GOODRICH 650x65 B.S. Cover, good condition, 12/-; 26x2 $\frac{1}{2}$ brand new Avon tube, 8/-; 8 ft. x $\frac{7}{8}$ in. brand new Dunlop belt, 8/6; 6 ft. x $\frac{7}{8}$ in. Dunlop belt, nearly new, 5/6; 7 ft. x $\frac{3}{4}$ in. Pedley, brand new, 7/3; 7 ft. x $\frac{3}{4}$ in. Dunlop, nearly new, 2-piece, 5/-.—19, Wilcox Rd., South Lambeth, London, S.W.8. [2783]

DELIVERY OF NEW MACHINES.

We have the following delivery dates open:

A.J.S. 6 h.p. twin Combination	136 gns. Mar.
BLACKBURN, 4 h.p.	£80 0 "
BLACKBURN, 8 h.p.	£100 0 "
B.S.A., chain-cum-belt	78 gns. Early.
CONNAUGHT MINOR, 2-speed	£41 3 Stock.
CONNAUGHT, Standard, 2-speed	£43 10 "
ENFIELD 6 h.p. Combination	110 gns. Feb.
ENFIELD 8 h.p. Combination	112 gns.
JAMES, 4 h.p.	£89 5 "
JAMES, 3 h.p., twin	£89 5 "
JAMES, 2 h.p., 2-stroke	£54 12 "
JAMES, 5-6 h.p., twin	£39 15 "
JAMES Sidecar	£22 10 "
JAMES Sidecar de luxe	£23 5 "
MATCHLESS 8 h.p. Combination	£140 0 Stock.
MATCHLESS, new standard finish, Palmer cord tyres, hood and screen, M.A.G. engine	— "
P. & M. 3 h.p. Combination	£102 0 "
ROYAL RUB, 8 h.p.	£105 0 "
TRIUMPH, 3 h.p.	£85 0 "

CASH. CREDIT. EXCHANGE.

The Service Company, Ltd.

289-293, HIGH HOLBORN,
LONDON, W.C.1.

Telegrams: Admittedly. 'Phone: 6430 Holborn.

LONGMAN Bros. of ACTON,

2, King's Parade. Telephone: 1578 Chiswick.
And EALING, 17, Bond Street,
Ealing Broadway.

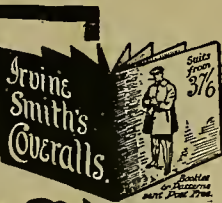
Always sound, reliable, Second-hand* Machines at reasonable prices.

1915 T.T. INDIAN, as new; mileage about 800.	£45 0
1916 T.T. 3 h.p. ROVER, Philipson pulley	£45 0
1918 A.J.S. 6 h.p.	£30 0
RUDGE MULTI	£30 0
ALLDAYS MATCHLESS	21 gns.
And others.	

Agents for Triumphs, Douglas, Norton, James, B.S.A., Rudge, etc., for which we are now booking orders. Some deliveries this month.

Machines and Outfits Bought for Cash. Good allowances made, and Exchanges with a cash balance either way.

N.B.—Owing to Ealing premises undergoing alterations, all communications to Acton Branch.



To know just how good my coveralls are for motor cyclists, get this book.

SEND A CARD
for your copy
TO
IRVINE SMITH,
Buttershaw, Bradford.

TYRES.

BASTONE'S for Covers and Tubes.—New clearance lines as below. Goods sent on approval against remittance.

BASTONE'S—26x2 Michelin light, 12/-, list 17/-; steel-studded, 24/-, list 43/-.

BASTONE'S—26x2 $\frac{1}{2}$ Michelin Trident, 22/-, list 32/3; Hutchinsos Brooklands, 18/-, list 29/5; Tourist Tropic, 25/-, list 41/-; De Luxe heavy, 32/-, list 45/6; Kempshall, 19/6.

BASTONE'S—26x2 $\frac{1}{2}$ Michelin heavy Trident, 26/-, list 35/9; De Luxe heavy, 35/-, list 51/3; Goodrich safety tread heavy, 45/-, list 57/6; Shell grooved, 18/6, list 36/-.

BASTONE'S—650x65 Henley plain, 35/-, list 53/3

BASTONE'S—28x3 rubber-studded, suitable for front wheel and sidecars, 32/6.

BASTONE'S—Wired edge covers: 26x2 $\frac{1}{2}$ heavy Trident, 19/6, list 32/3; 26x2 $\frac{1}{2}$ Michelin light, 12/6, list 18/6.

BASTONE'S—Special line of Michelin push-cycle covers, 28x1 $\frac{1}{2}$, 28x1 $\frac{1}{4}$, 26x1 $\frac{1}{2}$, 26x1 $\frac{1}{4}$, 6/9, list 2/-.

BASTONE'S—Hutchinsos tubes, 26x2 5/6, 26x2 $\frac{1}{4}$ 6/-, 26x2 $\frac{1}{2}$ 5/6, 28x3 9/6, butted 1/6 extra.

BASTONE'S for Belts, Pedley and John Bull, all sizes in stock.

BASTONE'S, 228, Pentonville Rd., King's Cross, London, N.1. Tel.: 2481 North. Telegrams: Bastone's, Kicross, London. [2778]

TYRES—See Baccaratian Advertisement under Miscellaneous. Stelnic, Pedley, Kempshall, Hutchinsos; extraordinary prices. [0845]

TYRES by Best Makers; nearly half present prices.—26x2 $\frac{1}{2}$ sidecar cover, 16/6.—Service Co., 292, High Holborn, London, W.C.1. [8747]

BURST Motor Cycle Covers Remoulded and made perfect; broken away beads remoulded; every job a success, or cash refunded; bursts from 3/6, returned carriage paid quickly.—Melton Rubber Works, Melton Mowbray. [X1400]

NEW Heavy Beaded Covers, 26x2 16/-, 26x2 $\frac{1}{4}$ 25/-, 26x2 $\frac{1}{2}$ 27/6; butt-ended tubes, 26x2 $\frac{1}{4}$ 8/6, 26x2 $\frac{1}{2}$ 9/-; endless tubes, 26x2 $\frac{1}{4}$ 7/6, 26x2 $\frac{1}{2}$ 8/-; sent approval carriage paid receipt remittance.—Palmer's Garage, Tooting. [9191]

TANKS.

TANKS of every description; repairs, re-enamelling. Write for booklet.—Green, Water St., Blackfriars, Manchester. [0900]

TANKS—Tanks any shape to order, repairs or enamelled; disc for motor wheels; general sheet metal work; lists free.—Attwoods, 86, Rosebery Av., E.C. Tel.: Central 12445. [9922]

PATENT AGENTS.

INVENTORS' Advice and Handbook Free.—King's Patent Agency, Ltd., 196, Queen Victoria St., London. [5818]

INSURANCE.

FOR Insurance of all kinds (specially motor), apply Ernest J. Boss, Insurance Broker, Bishops Stortford. [0693]

DREADNOT Motor Cycle Policies at Lloyd's. Premiums from 21/7/6, payable yearly, quarterly, or monthly. Before insuring elsewhere, write for prospectus.—Rois, Ltd., 199, Piccadilly, London. [7734]

TUITION.

MOTOR Tuition.—The British School of Motoring, Ltd., gives the highest standard of training in driving, mechanism, and repairs for the lowest fees in England. Call, or write for full particulars.—The British School of Motoring, 6, Coventry St., Piccadilly Circus, W. [0953]

AGENCIES.

OFFICER, Royal Air Force, keen motoring enthusiast, shortly returning to Australia, desires one or two good agencies.—Reply to Box L8,677, c/o The Motor Cycle. [2616]

FRENCH Motor Engineer residing in Paris, long experience and first-class connections, wishes to undertake agency for British light car and motor accessories, workshop and garage available.—Communicate first, Bayle, 6, Churchways Crescent, Hornfield, Bristol. [2681]

TO Manufacturers.—Manufacturer's agent, and buying agent for important firms in the East (now visiting India), wishes to get into touch with manufacturers of light cars, cycles, accessories, and especially novelties, with view to business in the East.—Box 2,662, c/o The Motor Cycle. [X1997]

GENTLEMAN with first-class connection, residing in Brussels (Belgian subject who speaks English), desires to represent in Belgium English manufacturers of cycles, motor cycles, accessories and tyres; 20 years' experience of the trade.—A. Watlet, temporary address 12, Dudley St., Luton. [2068]

PARTNERSHIPS.

GENTLEMAN, with capital and experience, age 25, desires partnership in good motor cycle garage or manufacturing concern.—Apply, Box L8,704, c/o The Motor Cycle. [2690]

CONSULTING ENGINEERS.

F. G. HERRIDGE, 10 years' practical experience. Offers unbiased advice on the purchase of new and second-hand motor cycle; machines examined and reported on; distance no object.—48, Clarendon Rd., Putney, S.W.15. [2693]

COLE and **Cleave**, 24, Union St., Birmingham, advise on the purchase, insurance, garage, installation, and maintenance of your machine, new or second-hand. Expert examination undertaken; advice on agrimotors, country house lighting, etc. [X2438]

REX MUNDY, after 12 years' all-round experience, offers unbiased advice in the selection of new and second-hand motor cycles and light cars; examinations and reports; vehicles bought and sold on commission; insurance.—Room 80, 83, Pall Mall, London, S.W. [2884]

ARE You Buying a Motor Cycle? Have it tested by a disinterested expert. I have had 9 years' experience of all makes, and this is at your disposal. Write me in any case. Fee for testing any make 10/6, exclusive of expenses.—Robert B. Breeze, Motor Expert, 92, Northgate St., Chester. [X2515]

SITUATIONS VACANT.

GOOD Motor Cycle Mechanic required immediately.—Age, wage, and references to Harpenden Garage, Harpenden. [2750]

DRAUGHTSMAN, cycle and motor trade.—State age, experience, and salary required, to Allways and Onions, Ltd., Matchless Works, Fallows Rd., Birmingham. [2613]

REQUIRED, Traveller for London, calling upon garages for a quick selling line on good commission.—Write, C/o Andriess Bros. and Co., 34, Gray's Inn Rd., W.1. [2852]

MOTOR Cycle Trade—Wanted, experienced progressive clerk for works, well up in figures, to increase output.—State previous experience, wages required, and present situation in confidence, to Box 344, Sells, Ltd., 168, Fleet St., London, E.C.4. [2697]

DRAUGHTSMAN Wanted, used to motor cycle design, including engines, gear boxes, and general lay-out.—Write in confidence, stating age, experience, and salary required, Mr. A. V. Smith, c/o Chatter-Lea, Ltd., 74-84, Banner St., E.C.1. [X1750]

CYCLE and **Motor Cycle Trade**—Wanted, first-class machine hand, fully experienced in machining and boring lugs.—State previous experience, wages required, and present situation in confidence, to Box 346, Sells, Ltd., 168, Fleet St., London, E.C.4. [2699]

MOTOR Cycle Trade—Wanted, first-class all-round men capable of building, brazing, and experimental work, for both motor cycle and sidecar chassis. Also good fitters and assemblers. Good wages and permanency for the right men.—State fully experience, wages required, and present situation in confidence, to Box 345, Sells, Ltd., 168, Fleet St., E.C.4. [2698]

TO Motor Cycle Engineers—Required immediately by old-established firm of manufacturers near London, first-class engineer, capable of forming department for the design and manufacture from start to finish of motor cycles. Excellent opportunity for individual with exceptional ability and experience, and good testimonials.—Reply in confidence, giving age, experience, and salary required, to Box 325, Sells, Ltd., 168, Fleet St., E.C.4. [2982]

SITUATIONS WANTED.

DISCHARGED Officer (ex-Pilot, R.F.C.) requires post as salesman, etc., in good motor firm dealing in motor cycles or cars; willing to invest £250 in same; previous experience, hard worker.—Lieutenant, 45, Lumsdowne Rd., Bournemouth. [X2331]

PATENTS.

PROPRIETOR of Patent No. 106,561/16, "Combined variable compression release device," for internal combustion engines, is desirous of negotiating for the sale outright, or royalty for same, with progressive firms.—Box 2,719, c/o The Motor Cycle. [X2541]

WANTED.

SUNBEAMS, Harleys, A.J.S.'s, Enfields, B.S.A.'s, Nortons, Triumphs, Matchless, and Morgans; 1915's and later purchased for spot cash.—Maudes', 100, Gt. Portland St., London, W.1. [1916]

WANTED, Levis Model E., or Douglas.—Box 2,695, c/o The Motor Cycle. [X2344]

LIGHTWEIGHT Motor Cycle—Carter, 82, Lechorn Rd., Harlesden, N.W.10. [2695]

CLEMENT-GARRARD, any type.—Elliott, Westralia, Ingate Rd., Beccles, Suffolk. [X2469]

2-STROKE, about 2½ h.p.—State date, etc., Coles, Bruham, Bruton, Somerset. [2639]

WANTED, Clyno or Matchless, not earlier than 1915.—14, Barnehurst Av., Erith. [2674]

COMBINATION wanted, any high-class make.—Box 18,594, c/o The Motor Cycle. [2541]

COMBINATION, high power, recent model; cash.—M., 4, Dollis Rd., Finchley. [2858]

WANTED, cylinder, for 1912 5-h.p. Clyno.—Smith, 16, King St., Bursley, Lanes. [X2325]

£2,000 Waiting for machines, any make; good prices given.—Booths Motories, Halifax. [2641]

1912 Clyno Back Wheel, with or without sprockets.—Harvie, Hallside, near Glasgow. [2603]

THE CENTRAL HOUSE for BARGAINS

COMBINATIONS.

1916 A.J.S., spare wheel, lamp set, speedometer very good condition £110

1916 B.S.A., No. 2 Sidecar, hood, screen, electric lamp set, 2 horns, condition almost as new £90

1916 Powerplus INDIAN, T.T. bars, 3-speed, kick-starter, Swan sporting Sidecar, Amac carburettor fitted £85

1916 ENFIELD Combination, hood, screen, lamp set; only done 800 miles. A beauty £105

1916 HARLEY, dynamo lighting, 1917 Sidecar, splendid condition £100

SOLO MACHINES.

1917 3½ h.p. ROVER, 3-speed, kick-starter, large Lucas lamp set, Klaxon horn; only done 300 miles; T.T. bars fitted £73

1917 3½ h.p. twin JAMES, Lucas lamps and horn; shop-soled only £67

1915 3½ h.p. twin INDIAN, 3 speeds, kick-starter, clutch, lamp set, beautiful solo mount, T.T. bars £50

WANTED.—Combination and Solo Machines; also a number of Light Cars. We pay wonderful prices for modern machines.

J. SMITH & CO.,

16, HAMPSTEAD ROAD, LONDON, N.W.1.

THE 150 MILES PER HOUR ISOCRONOUS SPEEDOMETER

Revolution Indicators on same principle used on Government Aeroplanes.

The Motor Engineer & Scientific Man's Instrument Under Escapement Control like a Watch.

What most perfect form is governor known.

No centrifugal or magneto governor.

Gives true reading at all speeds to 50 miles per hour and beyond UNLIMITED.

For motor cars, £7 10s., including driving gear; for motor cycles, £4 15s.

Liberal Trade Discount.

See "The Motor Cycle," September 26th, 1912.

Trip extra.

Also Mile Recorders Recommended and stocked by—

Messrs. Rotherham and Sons, Limited,

Rugby-Whitworth, Limited.

The Triumph Cycle Co., Limited,

and Branches and by all other high class firms.

Manufactured by the inventor of the Karnesl Watch.

B. BONNIKEN, 16, Norfolk Street, COVENTRY.

Apply for copy of National Physical Laboratory's Report.

Send direct unless your Agent can supply.

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WANTED.

ZENITHS.—90×77½ twin.—Maudes'.

B.S.A.—1916, 1917 solo or combinations.—Maudes'.

A.J.S.—1916 and 1917 combinations and lightweights.—Maudes'.

ENFIELDS.—1916 and 1917 combinations.—Maudes'.

DOUGLAS.—1915, 1916, and 1917 2 and 3-speed models.—Maudes'.

MATCHLESS.—1915, 1916, and 1917 M.A.O.-engined combinations.—Maudes'.

HARLEY-DAVIDSON 1915, 1916, and 1917 Electric and Standard Combinations.—Maudes'.

MORGANS.—1915, 1916, 1917 water-cooled J.A.P. or M.A.O. models.—Maudes'.

TRIUMPHS.—1915, 1916, and 1917 lightweight and conotershaft models.—Maudes'.

SUNBEAMS.—1915, 1916, and 1917 single and twin combinations.—Maudes'.

MAUDES' are Buyers of any of the above for spot cash; very highest prices for machines in good condition.—100, Gt. Portland St., London, W.1. Tel.: 552 Mayfair. [2851]

WANTED, Junior Triumph, 2-speed, about 1917.—25, Peel Grove, E.2 London. [2839]

WANTED, 2-stroke lightweight, good order.—69, Merthyr Rd., Whitechurch, Cardiff. [X2522]

B.S.A. Sidecar, in good condition.—Price, particulars, to West, Popeswood, Binfield, Berks. [2607]

SCOTT-MYERS Sidecar, complete, fit 1913 Scott.—Holt, 40, Kemp St., Fleetwood, (D) [X2339]

WANTED, good T.T. Douglas, perfect, for cash.—29, Briggstock Rd., Thornton Heath. [2815]

100 Motor Cycles Wanted, spot cash paid; bring or send, Palmer's Garage, Tooting. [0917]

WANTED, American Excelsior cylinder, front type, 1915.—Smyth, Lota, Gerrards Cross. [2840]

8 h.p. Rover Engine, chassis, or complete car, in good condition.—Bevir, Hursdown, Hendon. [2642]

LATE Model 4 h.p. A.J.S. Combination, or solo.—Sunnyside, Wash Common, Newbury. [X2517]

SUNBEAM Combinations: send particulars and price.—Service Co., 292, High Holborn, W.C.1. [9306]

WANTED, motor bicycle, 4-stroke, cheap.—Goodey, Brightview, Hadley Rd., New Barnet. [2812]

WANTED, Sidecar, cheap for cash.—Speelchey, 1, Gunnersbury Lane, Acton, London, W.3. [2864a]

LIGHTWEIGHT, must be cheap.—Send particulars to Slinden, 22, Akerman Rd., Brixton. [2673]

WANTED, 3½ h.p. or 6 h.p. combination, any make; spot cash.—29, St. Leonard's St., Bow, E.3. [2868]

WANTED, Douglas, 2½ h.p., 1914-1917, or Junior Triumph.—Babb, South Molton, Devon. [X2478]

ENFIELD or Matchless Combination Wanted, privately.—Mr. Harrison, 51, Pont St., W. [2791]

A.J.S., Harley, or similar combination, immediate purchase.—91, Clifton Rd., South Norwood. [2792]

DOUGLAS Motor Cycle Wanted, or 2-stroke.—Mr. Hayes, 5, The Exchange, Thornton Heath. [2793]

ENFIELD, 1913, 2½ h.p. cylinder, camshaft, magneto bevels.—N. Jackson, Peel St., Eccles. [2883]

WANTED, modern combination, also solo machine.—Albury, St. Mary's Rd., Frinton-on-Sea. [2716]

WANTED, lightweight motor cycle; exchange type-writer, cash.—21, Lyndhurst Rd., Hove. [2753]

AUTO-WHEEL wanted, with single lever control; cheap.—B., 33, Alexandra Rd., Reading. [2747]

WANTED, combination or runabout; lowest cash.—30, Canterbury Rd., West Kilburn, N.W.6. [2714]

WANTED, Morgan, complete, less engine, mag., and carburettor.—34, Monkswell Rd., Exeter. [X2335]

MODERN, any good make; state full particulars, price.—Mullis, 122, Cape Hill, Smethwick. [X2361]

WANTED, high-class sidecar combination, in perfect condition.—Pickson, Eastchiff, Sidmouth. [X1745]

WANTED, solo and combinations, good makes, not earlier 1915.—Brawn, 94, High St., Beckenham. [2577]

ENFIELD Combination. Send particulars and price.—Service Co., 292, High Holborn, London, W.C.1. [8838]

HARLEY Combination, send particulars and price.—Service Co., 292, High Holborn, London. [8736]

WANTED, combination, recent model, must be in first-class condition.—27, Dudley Rd., Grantham. [X2398]

1912 3½ h.p. Humber, with or without sidecar.—Berkeleigh, Manor Estate, Hemel Hempstead. [X2338]

WANTED, Triumph rear wheel, clutch model, 1913, good condition.—Kempster, Fairfield, Glos. [X2337]

WANTED, Bosch ZEV watertight, 45° to 50°, in good condition.—Fisher, Shipley, Sussex. (D) [X2303]



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Send for our Second-hand List.

**THE NORTH WALES
MOTOR EXCHANGE,
CHESTER STREET,
WREXHAM, N.W.**

WANTED.

- WANTED, 3-speed gear box, complete, to suit 7-9 h.p. Indian.—Baker, 19, Limekiln St., Dover. [X2374]
- 2-SEATER, in thorough sound condition throughout.—Full particulars, B., 34, Essex St., Colchester. [2726]
- PUSH Bicycle Engine Complete, also 22 target revolver.—Malcolm Young, Colyton, Devonshire. [2347]
- COMBINATION wanted, modern, and good condition.—Thompson, 25, Davisville Rd., Shepherd's Bush. [2842]
- WANTED, Bradbury footboards, also Autocycle lamp.—Calvert, Market St., Chorley, Lancs. [X2493]
- TRIUMPH Combination, 1913-1919, or A.J.S. Full particulars, 52, Alexandra Rd., Canton, Cardiff. [2072]
- BEST Motor Cycle offered for £16.—Comertford, Southgate, 57, Clarence Rd., Teddington, Middlesex. [X2359]
- 4 h.p. Douglas or similar combination: also good T.T. solo mount.—Albert, 23, Market Place, Kingston, S.W. [2626]
- MAGNETO (twice) for Moto-Reve, good condition.—State lowest price, 17, Suffolk St., Forest Gate, E.7. [2628]
- WANTED, G.W.K., or any other light car, in any condition.—Rustic Walk, Lower Bourne, Essex. [2624]
- ARIEL 5-6 h.p. Combination. Send particulars and price.—Service Co., 292, High Holborn, London, W.C.1. [8889]
- WANTED, frame, wheels, forks, for 2½ h.p. Douglas; spot cash.—Reply, Box L8,676, c/o The Motor Cycle. [2615]
- WANTED, good motor cycle combination: spot cash waiting.—64, Tilton Rd., Small Heath, Birmingham. [X2425]
- GOOD Modern Solo wanted, such as Douglas, Imperial, O.K., or other.—Box L8,593, c/o The Motor Cycle. [2540]
- WANTED, modern 6 or 8 h.p. motor cycle and sidecar, second-hand, for cash.—Dan Guy, Weymouth. [X2496]
- WANTED, Douglas, 1914 or later, good condition.—Send full particulars, Shore, Parkfield, Langley, Bucks. [2859]
- COACHBUILT Body only, light.—Price, sketch, and dimensions to Briggs, Ingleboro', Pinewood Rd., Swansea. [X2464]
- WANTED, back wheel with clutch and spindle, for Bat-Jap, 650x65.—Lloyd Morris, Hendre Wen, Llanywst. [X2397]
- TWIN-CYL. Combination required, any good make, 6 h.p. or over.—Kiug, Heath Bank House, Cheddle Hulme. [X2127]
- CHAIN-CUM-BELT Countershaft Speed Gear, also M.C. head light.—Barker, Cannon St., Bedminster, Bristol. [X2365]
- WANTED, front cylinder and piston, 1912 5-6 h.p. Clyno.—891, Ashton Old Rd., Openshaw, Manchester. [2635]
- IS Your Motor Cycle or Car hung up for repairs? We will buy it as it stands.—Railway Garage, Staines. [2871]
- WANTED, 2-speed lightweight of known make.—State full particulars, Sandum, 50a, High Rd., Wood Green, N. [2659]
- 100 Motor Cycles Wanted for cash.—Wandsworth Motor Exchange, Ebbw St., Wandsworth (Town Station). [8582]
- WANTED, good combination, Matchless or other good make, for cash.—29, Brigstock Rd., Thornton Heath. [2816]
- BODY, coachbuilt, about 60 inches long by 20 inches.—Full particulars, 108, Queenswood Rd., Forest Hill, S.E.23. [X2396]
- WANTED, motor cycle or combination: exchange freehold plots.—Shaddock, 99, Montague Rd., Leytonstone. [2621]
- WANTED, good quality 3½ h.p. or 4 h.p. motor cycle, second-hand; also good lightweight.—Baines Bros., Gainsborough. [X2346]
- A.B.C. (1915), Sunbeam, or modern make; repairs not objected to.—Carter, 17, Webster St., Green Hays, Manchester. [10965]
- NORTON Big Four and 3½ h.p. T.T., recent date. Send particulars and price.—Service Co., 292, High Holborn, London. [8756]
- 6 h.p. or 8 h.p. Combination, Enfield, A.J.S., Matchless, etc., condition immaterial if modern; price and particulars.—Pace, 1, Centre Av., Acton Vale, W. [2888]
- 2-SPEED Hub Gear, for 2½ h.p. New Hudson, or back wheel complete; must be in good working order.—State price to J.C., 192, Folkestone Rd., Dover. [X2395]
- WANTED, two wheels with solid tyres, not heavy ones, either wire or wood spokes. State weight and size.—F. Heaton, Carr Rd., Wyke, Bradford. [X2377]
- A SECOND-HAND Coachbuilt Body wanted, cheap for cash.—Send full particulars, with sketch or photo, to Brandon, 15, Eglinton Place, Saltcoats, Ayrshire. [X2340]



WELL and truly made from forged steel, "King Dick" Spanners grip "fair and square." They cannot burr a nut when properly adjusted. Famous for 35 years: guaranteed for ever. Four sizes, 3in. to 9in.

See that your spanner is stamped with the mark here shown—the mark of the genuine "King Dick."



ABINGDON ECCO, LTD.,
Abingdon Works, Tyseley, Birmingham.
London—G. H. Smith, 12, Mortimer St., London, W.1.

WANTED.

- £10 cash for best lightweight offered. Give date, full particulars; Yorkshire; deposit.—Box 2,702, c/o The Motor Cycle. [X2427]
- RAILWAY Garage, Staines, urgently require motor cycles of known make, any condition; generous cash prices paid. [2869]
- COMBINATION and Solo Machine, good make.—Particulars and lowest price, 94a, Swaby Rd., Earlsfield, S.W.18. [2596]
- MOTOR Cycle or Combination, any power, any condition; please write.—Speechley, 1, Gunnersbury Lane, Acton, London. [2864]
- DOUGLAS 4 h.p. Combination, or 2½ h.p.; slight repairs no objection: cheap for cash.—Box 2,703, c/o The Motor Cycle. [X2434]
- WANTED, F.N., 4-cyl., 7 h.p. and 5 h.p., for cash.—Wandsworth Motor Exchange, Ebbw St., Wandsworth (Town Station). [2738]
- DOUGLAS 2½ h.p., not earlier than 1915, must be in excellent condition.—F.N., 28, Holmwood Gardens, Finchley, N.3. [2768]
- SCOTT, not earlier than 1914, for spot cash: state engine number and full particulars.—Box L8,732, c/o The Motor Cycle. [2893]
- WANTED, Douglas, 2½ h.p., must be in thoroughly good condition. Write first.—Householder, 109, The Av., West Ealing. [2717]
- WANTED, 4-cyl. Motor Cycle, cheap; also old engine, about 1½ h.p.—Visick, 9, King's Parade, Church End, Finchley. [2880]
- RUDGE Multi, T.T. Isle of Man model; send particulars and price.—Service Co., 292, High Holborn, London, W.C.1. [9106]
- WANTED, good up-to-date second-hand accessories, state particulars and prices.—Service Co., 292, High Holborn, London. [8742]
- WANTED, B.S.A. sidecar, No. 2 model preferred; good condition; within reasonable distance of 42, Staines Rd., Twickenham. [2730]
- GOOD Solo or Light Combination, all accessories.—Write, stating lowest, cash waiting, Scott, 69a, Hambalt Rd., Clapham Common. [2794]
- WANTED, Triumph rear frame complete with Rear wheel, must be in perfect condition.—Apply, 173, Cleithorpe Rd., Grimsby. [2610]
- RAILWAY Garage, Staines, urgently require recent R small cars of known make in any condition; generous cash prices paid. [2870]
- WANTED, lightweight cycle, 1916-1917, must be in good condition.—Particulars to Goldsack, Penn Lane, Godalming. [X2234]

WANTED.

- WANTED, motor cycle, about £20, damaged or out of order preferred.—Jackson, 7, Osborne Rd., Brimsdown, Middlesex. [2837]
- WANTED, urgently, 1913-1916 3 h.p. Enfield, Zenith, Triumph, others; cheap.—William Jeckings, Bozeat, Wellingborough. [2705]
- WANTED, good light cane sidecar, with chassis and fittings, complete, suitable for Triumph.—Superintendent Gray, Lerwick. [X2455]
- WANTED for cash, late good make combination, about 4 h.p.—Particulars, Peters, 54, Hoppers Rd., Palmers Green, N.15. [X2026]
- WANTED, back axle casing for 4-speed F.I.A.T. car, 12-14 h.p.—Letters, E. Payne, 19, Muschamp Rd., E. Dulwich, S.E. [2702]
- WANTED, B.S.A. coachbuilt sidecar, good condition, luggage grid preferred.—Apply, Cooper, Stone Cottage, Wormley, Surrey. (D) [2645]
- CALTHORPE-J.A.P., New Imperial, Levis, or Allon (2-speed), and with sidecar preferred; cheap for cash.—5, Norwich Rd., Ipswich. [X2360]
- DAMAGED Motor Cycle or Combination wanted, any power, any condition; must be cheap.—Box L8,672, c/o The Motor Cycle. [2582]
- WANTED, Sidecar, coachbuilt, for P. and M.; particulars, condition, price, etc.—H.C., 172, Greenvale Rd., Eltham, London, S.E.9. [2863]
- WANTED, combination, new, or in first-class condition; kick starter and clutch essential.—Hughes, Engineer, Waterworks, Treherbert. [2625]
- WANTED, 3½ h.p. solo or combination, about 1913-1915, cheap for cash.—Full particulars and price to 74, Cherry Orchard Rd., Croydon. [2574]
- CLYNO, 1912, 5-6 h.p.—Wanted for kick starter, toothed crank and bush on crank wheel.—Prices to Hay, Beyton, Bury St. Edmunds. [2620]
- WANTED, 2 or 3-speed gear, with starter preferred, to fit 6 h.p. Bat-Jap; also coach sidecar.—14, Elderberry Rd., Well Hall, Woolwich. [X2485]
- WANTED, good combination, also smart body for Morgan; reasonable price for spot cash.—Fitt, Barossa Terrace, Church St., Chelsea. [2781]
- CAN Any Manufacturer Supply New Cylinder and Piston for 4½ h.p. 1913 Singer motor bike?—Apply, Box L8,729, c/o The Motor Cycle. [2889]
- WANTED, small single-cyl. magnetos, U.H. or similar, any condition.—Charles Parker and Co., 75, Park Rd. North, Acton, London, W.3. [2727]
- HARLEY-DAVIDSON or Indian.—I am badly in need of either for everyday use.—Write full particulars, Morgan, 10, Howard Rd., E.17. [2661]
- WANTED, an up-to-date sidecar combination, Indian preferred, not earlier than 1914 model.—Garage, 3, Selhurst Rd., South Norwood, S.E.25. [2677]
- INDIAN 7-9 h.p. Solo or Combination, not earlier than 1914, any condition; price reasonable.—Lieut. B., Brentwood, Beckfield Lane, Acomb, York. [2728]
- WANTED, 2-speed Countershaft Gear, with clutch and kick-starter, Jardine preferred.—D., 102, Salterford Rd., Tooting, London, S.W. [2758]
- WANTED, two Powerful Indians, at once; customers waiting.—Wandsworth Motor Exchange, Ebbw St., Wandsworth (Town Station). [2744]
- WANTED, Norton, Brough, Douglas, or Indian combination or solo, countershaft gears; state lowest cash.—Varty, Thundersley, Essex. [2813]
- WANTED, Harley-Davidson sidecar for 1915 machine, with all fittings, must be in tip-top order.—A. Furr, 35, Radcliffe Rd., Hitchin. [2795]
- WANTED, Indian or other powerful combination, not earlier than 1914; also sporting sidecar.—19, Wilcox Rd., South Lambeth, London, S.W.8. [2784]
- WANTED at once, reliable motor cycle, recent model with or without sidecar, for cash, or exchange Ford.—Box L8,673, c/o The Motor Cycle. [2603]
- 100 Motor Cycles wanted; bring or send for spot cash.—Palmer's Garage, Tooting. [2845]
- ONE Big and Little End Bush and gudgeon pin, for 1912 Triumph; also both valve springs, new.—Lt. Goding, Dallington, Pridaux Rd., Eastbourne. [X2320]
- COUNTERSHAFT Combination wanted, also solo machine; state year, full particulars, and lowest price.—Fawson, 223, Heneage St., Birmingham. [X2350]
- FIRST-CLASS Combination wanted, A.J.S. or Sunbeam preferred.—Full details, and rock bottom price to Sharman, 59, Richmond Rd., Lincoln. [X2474]
- WANTED at once, combination or light 2-seater car; good price paid.—Particulars and time to view, 436, Whitehorse Rd., Thornton Heath, S.E. [2745]
- ABOUT 270 Cash waiting for best 6 h.p. Enfield combination offered, not earlier than 1915 considered.—Strain, Lower Hunt End Farm, Crabs Cross, Redditch. [X2568]
- WANTED, 1913 A.J.S., 6 h.p., 3-speed, with or without sidecar, frame good; slight repairs to engine not objected to. No dealers.—Box L8,674, c/o The Motor Cycle. [2604]
- MATCHLESS 1914-18 M.A.G. Engine Combinations for cash, or exchange new Victory models; best cash allowance.—J. Tassell, 1a, Bloomfield Rd., Plumstead, S.E.18. [X1794]

WANTED.

26 IN. x 2 1/4 IN. Rear Wheel, complete with belt rim and dummy ring, for New Hudson.—Full particulars, J. P. Brown, Motor Agent, Loftus, Yorks. [X2489]

WANTED, Enfield 2-speed combination, or Harley-Davidson; will pay for good article.—Call by appointment, or write full particulars to 34, Warren Rd., Chingford. [2658]

WANTED, countershaft combination; state make, date, mileage, and h.p.; about £50 cash waiting; no dealers.—H. King, Eastdene, Rossall Rd., Cleveleys, Blackpool. [X2471]

TRIUMPH, B.S.A., Rudge Multi, or other modern combination, with coachbuilt s.c.; state lowest price; no dealers.—162, Pretoria Rd., Bordesley Green, Birmingham. [X2482]

FARMER wants 4 to 6 h.p. combination or solo, 1915 or later, countershaft gears. Give date, full particulars, lowest price for cash.—Hammond, Gammersgill, Middleham. [X2424]

WANTED, fully equipped powerful combination, roomy coachbuilt sidecar, recent make, reasonable price.—Chemist, 103, Speldhurst Rd., Bedford Park, Chiswick, W.4. [X2358]

WANTED, motor cycle, B.S.A., James, Matchless, A.J.S., in good condition. State full particulars, letters only. No callers.—Miss P., 59, Greville Rd., Whips Cross, E.17. [2660]

WANTED, motor cycle, also combination. Please write, giving date, price time viewed. Cash waiting for right thing.—Speechley, 1, Gunnersbury Lane, Acton Hill, London. [2581]

WANTED, coachbuilt combination, about 6 h.p., not earlier than 1914, must be in perfect condition and price reasonable; Manchester district.—Box L8,675, c/o The Motor Cycle. [2614]

WANTED, several good solo machines and combinations, for spot cash, or sell on commission; 5% when sold; no sale, no charge.—Youngs, The Parade, Kilburn, Hampstead 4807. [0977]

WANTED, modern combination, 8 h.p., 3-speed, detachable wheels, coachbuilt sidecar, 2nd accessories, complete; limit £90 cash.—Particulars to A.J.T., 25, Battersea Rise, S.W. [2665]

THE H.C. Motor Co. requires good combinations and solo machines for cash. Send or bring your machines to us. Cash offer made on sight.—H.C. Motor Co., 247, Finchley Rd., N.W.3. [1199]

WANTED, back stays, gear, and wheel complete with controls, must have free engine clutch, suit 8 h.p. Matchless-Jap twin; clutch only with wheel, etc., would do.—21, Barrack Rd., Exeter. [X2533]

SPOT Cash for Triumphs, Douglas, A.J.S., Enfields, Brough, Nortons, Hendersons, Sunbeam, Zenith, Harley-Davidson. Write, call, or Phone Holborn 5777.—Wauchope's, 9, Shoe Lane, London. [1334]

MODERN combinations, motor cycles, and light cars; distance no object; cash waiting.—Phone, write, or call.—Morris' Presto Motor Works, Ltd., Tanyworth Rd., West Croydon, Surrey. Est. 1881. Croydon 1545. [2227]

WANTED, motor cycle combinations, light cars, or Morgans; condition immaterial if of fairly recent date; distant to view no object. Send fullest particulars.—80, Pershore Rd., Edgbaston, Birmingham. [2345]

PERCY and Co. require at least 100 second-hand motor cycles and combinations. Please offer us your mount. We offer exceptional high prices. We pay you cash on sight.—Percy and Co., 337, Euston Rd., London. [0925]

THE H.C. Motor Co. can take a few good motor cycles and combinations for sale on commission, 5% only charged when sold; no other charges.—Write for full particulars, The H.C. Motor Co., 347, Finchley Rd., N.W.3. [1200]

WANTED, Indians, B.S.A.'s, Sunbeams, Triumphs, Enfields, Harleys, A.J.S.'s, Matchless, Douglases, Zeniths; spot cash. Send particulars and price.—Wandsworth Motor Exchange, Ebner St., Wandsworth (Town Station). [2524]

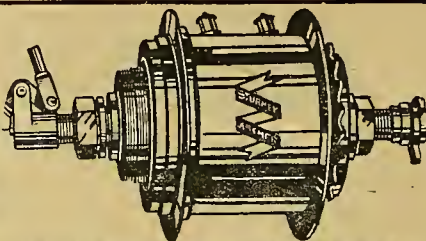
WE Are Wanting several solo machines and combinations. Send full particulars, and our representative will call with cash and bring away if suitable, or would exchange with piano or furniture.—Bunting, Mason's Ac, Harrow. [1915]

N.S.U. 2-speed Gear, to fit Premier, 3 1/2 h.p. White and Poppe engine, 3/4 in. screwed shaft (not taper); must be complete and perfect. State price and particulars.—H. Todd, Moorwinstow, Leicester Av., Broughton Park, Manchester. [X2475]

8 h.p. T.T. Cycle, 1913 or later, direct belt drive, Zenith, Matchless, or other good make; also modern sporting sidecar, and 8 h.p. air-cooled twin cycle engine, J.A.P. or other complete unit preferred.—Box 2,698, c/o The Motor Cycle. [X2366]

WANTED, motor cycles, cars, lorries, etc., etc. We are one of the oldest and largest buyers in the U.K. We pay full value.—The Southern Motor Co. (Established 1895), 230-232-234, Brixton Rd., S.W.9, also at Acre Lane, Works: Wandsworth. [2804]

WE are buyers of motor cycles of the following makes, not earlier than 1914: A.B.O., A.J.S., Brough, Enfield, Harley-Davidson, Henderson, Indian, Norton, Sunbeam, Triumph, Zenith, and other good makes.—Write, giving particulars and prices, Service Co., 292, High Holborn, London. [8743]



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HUB GEAR REPAIRS.

We can supply all parts for all types from stock.

Repairs to above gears in one day.

DOUGLAS GEAR BOX PARTS IN STOCK.

ANY COUNTERSHAFT GEAR PART MADE.

Send pattern parts if quotation is required, as we are not acquainted with every type of gear box made.

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BIRMINGHAM.

WANTED.

G. LAFAYE, 2, Place Tartas, Bordeaux, wishes to obtain from British manufacturers their latest catalogues of cycle cars, motor cycles, sidecars, cycles, and accessories, together with best wholesale export quotations and trade discounts for cash. [2772]

SEND Your Motor Cycle to Palmer's Garage, Tooting, Wimbledon Station. Cash offer will be telegraphed immediately on receipt of machine. Machine can be included in fortnightly auction without charge if offer not accepted. Reserve price may be fixed.—Sole address, Palmer's Garage and Auction Rooms, 183-199, High St., Tooting. [0918]

EXCHANGE.

MAUDES'.

MAUDES' Arrange Exchanges on any machines; best allowance for modern machines. See other columns for particulars.—MauDES', 100, Gt. Portland St., London, W.1. [2850]

EXCHANGE P. and H. Plated Generator for Douglas tools.—33, Kendrick Rd., Reading. [X2440]

GENT'S Cycle, B.S.A., 3-speed, in good condition, for sidecar.—Free, Upper Marsh, Wycombe. [2627]

CHAPPELL Piano; exchange for motor bike and cash; first arrival.—Apply, 159a, Kentish Town Rd., N.W. [2622]

SPLENDID 3 1/2 h.p. 2-speed Sidecar Humber, for 2-speed 2-stroke Allon, as similar.—24, Old St., Ash-ton-under-Lyne. [2846]

SCOTT Combination, value £50; wanted 2-seater; balance easy payments; Lincoln.—Box L8,730, c/o The Motor Cycle. [2890]

EXCHANGE Henderson or Matchless combination for late Douglas and cash or light car.—29, Brigstock Rd., Thornton Heath. [2814]

NEW Lady's Fleet and gent's Raleigh cycles for 1912 3 1/2 h.p. 3-speed Triumph or Bradbury.—20, Park Rd., Willesden, N.W.10. [X2356]

EXCHANGE Cycle Car, 2-speed, reverse, or 3 1/2 h.p. N.S.U., 2-speed, and £5, for twin combination, or sell £35.—Allen, Frampton-on-Severn, Glos. [X2433]

1915 Champion 6 h.p. J.A.P. Combination; £65, or exchange 2-seater or higher power, cash adjustment.—Farrage, 148, Berners St., Leicester. [X2402]

EXCHANGE Indian T.T. bars and front wheel, complete less tyre, for good pair India touring bars and electric sidecar lamp, or sell.—Rostance, Radstock, Som. [2543]

WANTED, good combination; exchange Broadwood boudoir grand piano, fine condition.—180, Finchley Rd., N.W. Phone: 2161 Hampstead. (Before 6 p.m.) [2630]

EXCHANGE.

EXCHANGE 1917 Harley-Davidson combination, perfect order, splendid condition, for lower power and cash, or sell for cash £100, bargain.—Box 2,710, c/o The Motor Cycle. [X2520]

EXCHANGE Harley Combination (see advt. under Harley-Davidson) for Morgan, not earlier than 1915, cash adjustment if necessary.—Hawthorn House, Prospect Place, Pembroke Dock. [X2343]

HUDSON, 4 h.p., 1914-15, 3-speed, free engine, Canoelet, £35, and Wolf, 2 1/2 h.p., 1914-15, Multi, free engine, £15; for powerful heavyweight, cash adjustment.—Sa, Horace Rd., Forest Gate. [X2399]

8-10 h.p. Williamson Combination, 2 speeds, free H.8 under-slung C.B. canoelet sidecar, hood, screen, fully equipped, splendid condition; 58 c.u.s., exchange lower power, cash adjustment.—35, Mowbray Rd., Brondesbury. [2819]

WRITE to us about that exchange deal you are contemplating. We can quote you the best allowance. Your old machine taken in part payment for a new machine, for early delivery.—The H.C. Motor Co., 347, Finchley Rd., N.W.3. [2243]

SUN-VITESSE, 1915, single gear, Palmer tyres, condition throughout as new, £27; wanted, either single-cyl. Rover, Humber, Sizaire, any condition, for cash, or part exchange for above.—Lieut., Apsley, Fel-low's Rd., Farnborough, Hants. [X2457]

MORGAN Runabout, 1914, a.c. J.A.P. engine, Binks carburettor, just overhauled, very fast, new hood, screen, large lamps, 2 horns, speedometer, clock, good tyres, 2 new unpacked Avon spares, paintwork excellent; any trial; hardly been used; price £75, will accept good motor bike part exchange.—Write 5, Corn-nought Gardens, Forest Hill, Northumberland. [X2341]

REPAIRERS.

ARMSTRONG Gear Repairs, promptly and efficiently.—County Engineering Co., Hounslow. [8500]

FOSTER, of 170, Cardigan Rd., Leeds, is again of your service, and can now undertake any class of welding and machine work.

CYLINDER Grinding and Piston Making is with us a speciality. We shall be glad to have your enquiries.—Foster, Leeds.

PISTONS—We specialise in the manufacture of special aluminium alloy pistons, in hundreds of odd ones.—Foster, Leeds. [0310]

PISTON Rings, high grade, low price; standard or oversize.—Patent Rings, 50, Wigan Rd., Atherton. [1758]

WELDING Broken Cylinders, flanges, combustion heads; immediate attention; reasonable prices.—Below.

WELDING Aluminium Crank Cases, gear boxes, by experts of 11 years' experience.—Below.

CYLINDER Grinding on latest machinery installed since hostilities ceased; accuracy guaranteed; new pistons fitted.—Sadgrove and Co., 140, Conybere St., Birmingham. [X0803]

IS Your Car or Motor Cycle hung up for repairs? We will buy it as it is.—Railway Garage, Staines. [2872]

WELDING—Broken cylinders, pistons, connecting rods; cylinders rebored, new pistons and rings.—A. Pilkington and Co., 390, Lichfield Rd., Birmingham. [2198]

FRAME Repairs and Alterations—Special frames and tanks built, any designs; enamelling and plating.—A. Pilkington and Co., 390, Lichfield Rd., Birmingham. [2198]

PAINTING, body building, conversions, hoods, and screens to clients' requirements; quick deliveries; quotations with pleasure.—Palmer's Garage, Tooting. [1991]

GROVER, Smith and Willis, Basingstoke, will make a first-class job of your repairs. We have a fine machine shop and welding plant, and skilled mechanics. [2599]

CENTRAL Motors (Oldham), Ltd., undertake to thoroughly overhaul and repair any make of motor cycle.—Below.

BROKEN Frames, forks, crank cases, connecting rods, pistons, cylinders, etc., etc., welded by the process of oxy-acetylene. Send your enquiries. All work guaranteed.—Below.

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The Sporting Single.

DESPITE the undoubted advantages of the clutch, the reliability of chain transmission, and the convenience of a change of gear ratio, there is still a large coterie of motor cyclists who recall with affection the single gear mounts of a decade ago. In developing the motor cycle as a machine for the multitude, the rider, the trade, and the A.C.U. together have gradually changed it from an ultra simple sporting mount into a single track vehicle embodying most of the elements of a car. That it serves the purpose of the majority in its latter form goes without saying; nevertheless a large demand still exists for single gear solo mounts such as were in vogue in 1909, plus, of course, increased engine efficiency and more scientifically designed frames.

Ten years ago the average motor cycle was a single cylinder single-gear machine weighing about 170 lb. and costing something under £50. The appeal of this class of machine lies in its comparative simplicity, light weight, and high speed. In addition, the light rear wheel enhances the charm of the machine by playing no small part in its powers of rapid acceleration and general "nippiness," which are absent when a machine has a rear wheel embodying a clutch or made heavy for more serious work.

Again, there is nothing to equal the all-belt drive for silkiness of running. Present-day belts should give no trouble whatever on solo machines, and it is to be hoped that the lost popularity for all-round purposes will not be responsible for the entire abandonment of the all-belt drive by the trade.

We are constrained to refer to this type of machine because, at present, there appears to be a tendency for makers to produce only a double purpose "single," and to discontinue the manufacture of the old 500 c.c. type in favour of an engine a little larger. To render these machines suitable for sidecar purposes, they are made heavier than is necessary and desirable for

solo use, and have a gear box and transmission which are only essential for passenger work. In other words, these dual purpose machines are sidecar models which can, if desired, be used as solo mounts and not, as they were a few years ago, solo machines with light sidecars attached.

This, of course, is as it should be, as by these methods it is possible to give greater satisfaction to the majority than would be the case if the machine were only a "makeshift" when used with a sidecar. Nevertheless, it should not be overlooked that a large percentage of the original demand for the sporting single-gear belt-driven machine still exists, and, in addition, a large number of potential buyers of such machines join the motor cycle ranks every year.

The Control of the Roads.

THAT the development of self-propelled traffic is one of the most urgent reconstruction problems is without question. Motor vehicles will be among the most important factors in the restoration of commercial prosperity of the country. Therefore it is the duty of all motor cyclists, as an important section of the motoring community, to take an intelligent and definite interest in the present legislative proposals. The situation is, briefly, that a Ministry of Transport is being formed, under the leadership of Sir Eric Geddes, which proposes to control the roads and bridges of Great Britain, and there is a very serious danger that such a proposal will be rushed through Parliament before the public realise the measures that are being imposed on them. The greatest danger lies in the fact that Sir E. Geddes is a railwayman, and he is surrounded by others with the same interests. We must see that the roads do not suffer the same fate as the canals. The bigger motoring organisations are beginning to take action, but unfortunately individually instead of collectively. We must strengthen their hands, and above all urge unity of action.



Occasional Comments



Bigger Two-stroke Engines?

I SUPPOSE that eventually the motor cycle engine will need as little attention as a push bicycle, and that this ideal will depend partly on improved design and partly on the use of improved materials. Studying a diagram of the A.B.C. cycle car, it occurred to me how extremely foolproof and easy to keep in repair such a chassis would be if it were equipped with a two-stroke engine. The transmission is already so simple that no driving skill is required, and that refacing the discs is the main item of repairs. Impose upon such a transmission a two-stroke engine with a magneto drive so arranged that it can only be replaced in the right position, and you get an incredibly foolproof 'bus at an extraordinarily low manufacturing cost. Of course, the snag is that as yet we have not made two-stroke engines exceeding $2\frac{1}{2}$ h.p. which would keep cool without the aid of water. If big air-cooled two-strokes come along, they will lower engine costs and reduce normal engine maintenance to mere decarbonisation.

Advances in Two-stroke Cooling.

AS the stationary air-cooled four-stroke engine has advanced from, say, 8 h.p. to close on 400 h.p. during the past five years, two-stroke enthusiasts may be pardoned for hoping that a proportionate increase in the maximum size of an air-cooled two-stroke cylinder has occurred. There is little evidence on the point. Two-stroke engine design has been practically stagnant. A good deal of drawing office work has been done, and a few experimental engines have been made and run. None of them has set the Thames on fire. It is premature to hope as yet for even an engine such as would simplify the cycle car mentioned above. On the other hand, every advance in cooling affects the two-stroke *pro rata*. I think we may hope to see in 1920 motor cycle two-stroke engines of fair size which do not bake their piston rings, or require decarbonisation every 750 miles, or render their sparking plugs incandescent on bad hills, or depend on lashings of oil to prevent seizure.

A War Incident.

IN 1914 a firm designed and built an ambitious bicycle with what passed as a real walloping air-cooled two-stroke engine in those days. It never went into production for the simple reason that it would not run for more than half a mile under roadster conditions. Not so long ago the makers confessed their worries to an engineer whom they supposed to be a leading light in air-cooled aero engine design. In actual fact none of his aero engines had made good—from that standpoint he was something of a failure. But he knew quite enough about cooling to transform the 6 h.p. cycle engine. He gave its makers a few tips, and when their bantling next took the road it toured quite obediently with a sidecar! This incident

is significant. There are at least three British aero engines of different makes which have beaten the world in air-cooling on the grand scale. If a designer who knows the principles underlying one of these engines from A to Z could be induced to concentrate on the two-stroke —? There is unquestionably a tendency amongst designers in general to consider the two-stroke. For example, a leading firm of car manufacturers have had an experimental two-stroke car on the road for months. Several aero engineers are busy in the same direction. It is not easy to be sure what perfected two-strokes might offer us, seeing how crude pre-war two-strokes were in comparison with four-strokes. But at least it is certain that the two-stroke is a far cheaper manufacturing proposition, and also that it is very considerably simpler for an owner to maintain.

1919 Prices.

I AM not one of those who suspect that the manufacturers are profiteering. Admittedly, £50 for lightweights and £80 odd for a $3\frac{1}{2}$ h.p. tourist solo are "some" prices compared with 1914. Admittedly, also, it is the custom of vendors in all trades to grade their prices with an eye upon demand. One friend of mine intends to market a car, the price of which will not be settled definitely until he has "felt" the demand. He can turn out 1,000 chassis per annum, and if he gets 1,000 orders the price will be the minimum at which he can make a fair profit, e.g., £750: but if he gets 2,000 orders the price will be £1,250 or so. Suspicious riders recognise that there is an unprecedented demand for machines, and fancy that makers are taking advantage of the situation. I never hesitate to go for the trade when I feel like it, and my proprietors allow me considerable latitude in that respect: but I hold the trade absolutely guiltless at the present moment. The prices of commodities are up about 100% on the average: motor cycle prices are up about 25-33%—it is astonishingly little. Moreover, there is an excellent reason why every maker must offer us the best and cheapest proposition in his power. 1914 reputations have to be confirmed, if not regained, after a five years' moratorium. They have to compete with the wares of mushroom firms, lately engaged on munitions. Some of these mushroom firms possess magnificent resources—brainy staffs, skilled hands, huge shops, modern machinery, big capital, and special experience in aero work. In 1914 we could take it for granted that the tiptop firm of 1913 would be near the summit in 1914. In 1919 it is just possible that a firm which did not even exist in 1914 may top the motor cycle tree. So the buyer is, for the nonce, master of the situation. His old tyrant, the firm who kept him waiting for delivery in 1914, has to win his custom and his confidence all over again. Firm and customer are in much the same position as one of those quaint divorced couples in

PELMANISM IN 1925.

BY A BUSINESS MANAGER.

In the Pelman lesson dealing with Imagination and how to turn it to account occurs the following sentence: "It is by the power of Imagination that we are enabled to picture what might be." After re-reading this during one of my periodic reviews of the Course, it flashed across my mind that it would be interesting to attempt to visualise what Pelmanism might be in 1925.

So rapid has been its progress during the War that one can do no more than speculate on what will be the exact position of Pelmanism a few years hence, though it is fairly easy to foresee some of the results of the spread of this System of mind and memory training.

A SHORT REVIEW.

Let me remind readers quite briefly of one or two facts concerning Pelmanism. A quarter of a century ago it was unknown. For years its advance was slow—it was too new for most people. They scoffed at the idea of mind training; said it couldn't be done. But its founder, Mr. W. J. Ennever, and those associated with him, lacked neither courage nor hope. Sooner or later, Pelmanism would earn the recognition which was its due; of that they were confident. During the three or four years immediately preceding the War Pelmanism was just coming into its own. It remained for the War, however, to work that change in our mental outlook which has given Pelmanism its real opportunity. In the fifty-one months since August, 1914, as many people adopted Pelmanism as during the previous twenty years, while since the Armistice was signed the daily enrolments have been greater than ever, and the half-million total in the membership of the Institute is now within sight.

A MINISTRY OF PELMANISM.

Thus my imagination pictures the establishment of a Ministry of Pelmanism, working in close harmony with the Ministries of Education, Labour, Overseas Trade, and other departments of the Government. Pelmanism will then occupy a prominent position in the curriculum of our Elementary, Secondary, and Public Schools, while every teacher will be a qualified exponent of its principles and their application, not only to the study of other subjects, but also to the problems of after-school life and work. "Going to school" will be shorn of its terrors and become a true delight to the children. Their ordinary lessons will gain so much in interest through Pelmanism that the task of the teacher will be considerably lightened.

I conceive, too, that, that every boy and girl over school age will be required to work through the Pelman Course, and pass an examination on its teachings as a part of the vocational training which, we hope, by that time will be a feature of our national life. So many of the employers of 1925 will be people who are now studying the Course and will benefit from it during the years just ahead of us that it will no doubt be a common practice to insert the stipulation "Must be a Pelmanist" in their advertisements in the "Situations Vacant" columns of the newspapers, for, by 1925, it is practically a foregone conclusion that the superiority of the Pelman-trained man or woman will be universally recognised, no matter what his or her occupation may be.

MILLIONS OF PELMANISTS.

In my mind's eye I see Pelmanism making inevitably greater and greater headway each year, until in 1925 its adherents are numbered by millions, even if no move has been made in the meanwhile to nationalise the study, as has been repeatedly suggested in many quarters. But I cannot imagine five years—and five of the most fateful years in the history of the British Empire—passing before some definite step is taken by Parliament towards making Pelmanism a part of our national education.

EXIT THE SCOFFERS.

No great movement has made progress without arousing a great deal of opposition. Pelmanism is no exception. Yet it seems to me that another five years will witness such a thinning of the ranks of the scoffers and sceptics who now, through sheer ignorance, deride Pelmanism, that no anti-Pelmanist will dream of airing his views in 1925 for fear of being considered eligible for a lunatic asylum.

A PELMANISED WHITEHALL.

At the risk of being considered a visionary or a super

super-optimist, I think we might count within the realms of possibility the reorganising and reconstruction of our Governmental Departments on a Pelmanistic basis. The examples of business efficiency provided by two or three of the newest Ministries have raised hopes in some of us, and surely, with Pelmanism on the flood-tide, we can look forward to the time when all the departmental cobweb and red tape will be swept away, leaving behind only organisations which will be of a real service to the nation.

And here my imaginings must end. These somewhat scrappy views of what Pelmanism might be, and might be doing, in 1925 may appear far-fetched and rather ridiculous. Blame my enthusiasm for Pelmanism for my foolish optimism, if so you describe it, but remember at the same time that, six years ago, nobody would have dared to predict that Pelmanism would occupy the eminent position it does to-day.

WHAT "TRUTH" SAYS.

Let us now attempt to summarise the points which emerge in a survey of the present position of Pelmanism. The first is the enormous extension of the work done by the Pelman Institute. Pelmanism is to-day a household word. The little grey books which contain its teaching are being carried all over the world wherever the English language is spoken. In Mesopotamia and Macedonia, on nine sweepers and battle cruisers, men of all ranks are busy in their leisure moments training their minds to a higher efficiency. And at home men and women of all classes are just as earnestly striving to make themselves mentally fit. A roll of a quarter of a million students is something to boast about, a roll of a quarter of a million* contented students is a matter for justifiable pride.

The second point that stands out prominently is the recognition of the value of Pelmanism which is being bestowed upon it by those interested in public education and the public welfare. A third notable point is found in the fact that the advantages of the training offered by the Pelman Institute are being ever more largely sought for other reasons than financial, business, or professional advancement. When first dealing with the subject *Truth* suggested that there was no class, however highly placed or expensively educated, which could not profitably adopt Pelmanism, that it was more than an avenue to business efficiency and promotion, since it offered a means of real intellectual development.

This phase of the training is shown to-day to have aroused the interest of a very numerous class. The leisured classes of both sexes are now studying Pelmanism in ever increasing numbers with satisfaction to themselves. Distinguished Pelmanists are to be found on the roll by hundreds.

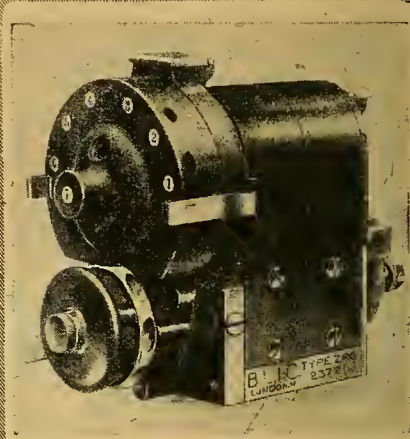
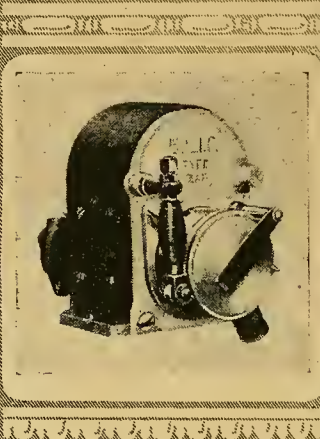
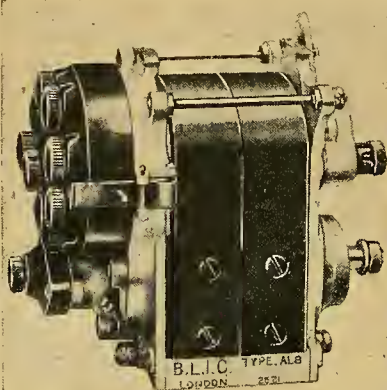
All ranks of the peerage are represented, the judicial bench, eminent men in all the professions, sailors, soldiers, and diplomatists, leaders in society and social service are finding out that through Pelmanism life can be made fuller and rounder.

In all the correspondence one detects only one note of regret—that the student had not made the acquaintance of Pelmanism sooner. On the other hand, the mental results chronicled are of manifold diversity. Self-realisation, extension of interest in life generally, mental stimulation, increased clarity of thought, a greater appetite for knowledge, a source of new ideas, are some of them which alone would justify *Truth's* recommendation of Pelmanism as an intellectual and social factor of undeniable importance.

* Now 400,000.

Full particulars of the Pelman Course are given in "*Mind and Memory*," which also contains a complete descriptive Synopsis of the 12 lessons. A copy of this interesting booklet, together with a full reprint of "*Truth's*" famous Report on the work of the Pelman Institute, and particulars showing how you can secure the complete Course at a reduced fee, may be obtained gratis and post free by any reader of "*The Motor Cycle*" who applies to the Pelman Institute, 199, Pelman House, Bloomsbury Street, London, W.C.1.

In answering this advertisement it is desirable to mention "*The Motor Cycle*."



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“The Magneto Pre-eminent”

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We trust you will specify the “B.L.I.C.” Magneto for your post-war requirements.

**THE BRITISH LIGHTING AND
IGNITION CO., LTD.,**

Proprietors: VICKERS, LIMITED,

204, Tottenham Court Road, London, W.1.



Occasional Comments.—

America, who are flirting with a view to re-marriage. For twelve months at least, gentlemen, the makers will do the wooing, and it is the buyer who will be coy. As for the agents—well, I dare say *they* are dreaming of premiums: and considering what Barmecide banquets their showrooms have offered for 4½ years, I can feel for them.

The "Tiny Tot."

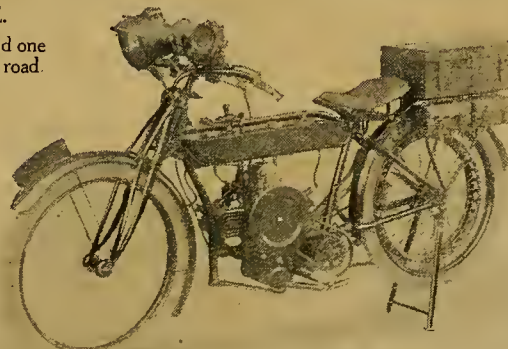
WHEN we find standard roadsters fitted with 350 c.c. engines capable of 60 m.p.h., and a 220 c.c. engine ready to develop 5 b.h.p., the "tiny tot" brigade, who clamour for an 80 lb. potter-about jigger, appear to be within sight of their goal. Ever since the 1⅓ h.p. Clement-Garrard bicycle of 1903, weighing 70 lb., there has been an insistent demand for very cheap featherweights, and a steady trickle of production to meet it. The dimensions of the demand are unverifiable, but it is probably big if a good machine can be turned out at the right price. The Auto-wheel and the motor scooter are the latest examples: the latter is a freak: the former is not over-powered, and in other characteristics falls a shade short of current standards. Still, a lot of water has passed under the bridges since the last tiny tots made their *début*, and I think the position to-day is that a good little one is apt to cost as much as a good medium-sized one, and that the tiny tots are still looking for a suitable transmission.

The Little Fellow's Needs.

WE can certainly get an engine of the required power at the required weight, and a good engine at that; the chief bother is that the magneto and carburetter will weigh as much as the rest of the engine put together. I once bought a brand new French carburetter from Gamage for ros. 6d.; it weighed under 1 lb. and worked tolerably well. If somebody could produce a vaporiser of this kidney, and somebody else would do as much for the ignition (*i.e.*, a flywheel magneto), the wee engine would be about right. Then comes the trouble that little engines want rather special transmission. Garrard used twisted raw hide belts with steel hook fasteners, and a fixed gear of about 7 to 1. When the belt slipped, you twisted it more tightly; when it pulled through you chopped the end off, untwisted it a bit, and pierced a fresh hole. The modern rider will not stand this. He insists on variable climb-all-hills gears, and there must be no fear of slip. Moreover,

AS THEY REACH THE DEPOT AND AS THEY EMERGE.

A Douglas as it is dumped at a salvage repair shop in the West of England, and one of the repaired machines—rebuilt, enamelled, equipped, and tested for the road.



as the wee engines only attain their high power output by revs, a variable gear is actually a necessity. Hence it is next to impossible, as yet, to provide a cheap; featherweight transmission.

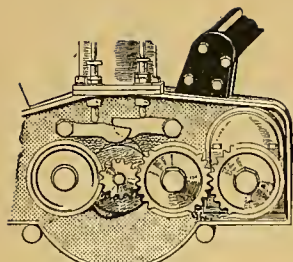
Air Leaks in the Induction Pipe.

NOT long ago I saw a huge aero engine, on which a very simple provision against air leaks at induction joints was employed. The pipes bolted to each inlet valve port were "stubs," cut off short; and they were connected to the main carburetter manifold by giant rubber insertions, tightened round the pipe-ends by strong band clips. This flexible joint is cheap to make, overrules all small errors of alignment, and permits the erectors to concentrate in securing a good joint at each cylinder port. I think it is worth adoption on certain multi-cylinder motor cycles, which have bad reputations in this respect. The tip is easily tested, without greater risk than the possible scrapping of an inlet pipe implies. On some V twins there is hardly space for a rubber insertion of adequate length, but the idea is easily applicable to any flat twin.

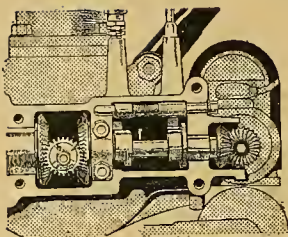
A Big Sporting Twin.

SOME years ago I chanced to handle Jake, de Rosier's 90 m.p.h. racing Indian, and ever since I have wondered whether our own trade would ever evolve a really light sporting twin. In the old days we did not bother about variable gears, huge lamps, big carriers, etc., and one of the early single-gear 5 h.p. Bat machines, for example, probably weighed less than the average modern 3½ h.p. roadster. Nowadays, a machine has little chance of finding customers unless it possesses a variable gear. The consequence is that by the time a maker has equipped a sports twin it is nearly as heavy as the roadster model, and can only be distinguished by dint of o.h.v. or a dropped handle-bar. Now a stripped twin of 5-8 h.p. offers us some of the very finest sensations in the motor cycling gamut. Such a machine should differ from the roadster model in the following respects:

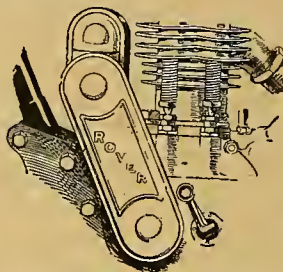
- (1.) Hot-stuff engine. (2.) Maximum weight reduction.
- (3.) No equipment except stand and toolbag.
- (4.) Short frame and special steering. (5.) (?) Single gear. I add the last item rather tentatively. I can only speak for myself. It is a very bad hill which I cannot climb with 5 h.p. and an adjustable pulley, and on a sports mount I prefer the lightness of such an outfit to the weight of two chains and a gear box.



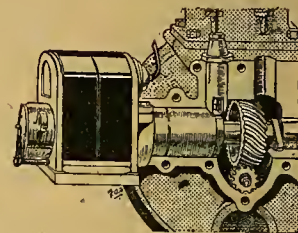
The Orbit magneto, enclosed with cams and gears.



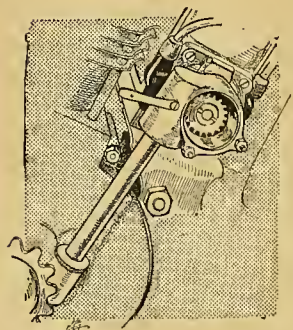
Shaft and bevel-driven magneto on the Diamond.



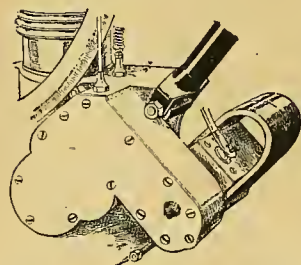
The single-cylinder Rover with chain-driven magneto at the rear



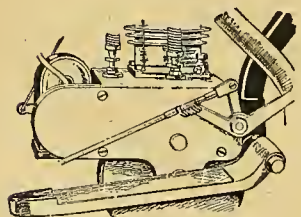
Shaft and spiral gear-driven magneto on the Puch.



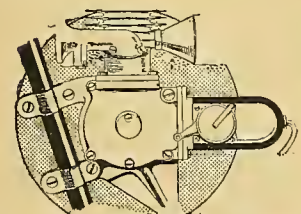
The worm-driven magneto on the Pope.



An American single with front gear-driven magneto



The gear-driven magneto at the rear of the single-cylinder Quadrant engine.



The Evans cyclemotor. A neat magneto disposition on an American auxiliary motor.

MAGNETO DRIVE AND POSITION.

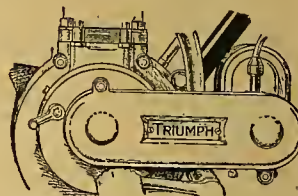
An Important Point in Design Reviewed.

THE magneto is, perhaps, the most important unit of a motor cycle engine. It is also a most delicate piece of mechanism, and probably the least understood part of the machine. It is, however, appreciated by most riders that, to give the best results, a spark should be produced during a certain definite fraction of a second.

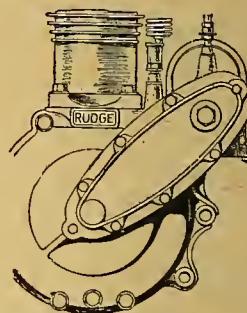
That some machines have the magneto in one position and others in a totally different place appears to pass unnoticed by the large majority of owners. If a magneto is located where it is bound to receive more than its full share of mud and wet, the rider may complain because he has to clean its exterior, but he rarely thinks what influence the position may have on the efficiency of the engine.

Some magnetos are driven by a chain, some by gears, and a few are shaft-driven. At one time the accepted practice in both twins and singles was to fit the magneto in a low position at the front of the engine, and to drive it by a cycle chain. This position and transmission system will be found on many of the best modern machines, yet the thinking motor cyclist will not agree that it is ideal. Designers, of the latest twins, have brought the chain-driven magneto to the rear, but on the representative singles of to-day the low front position is still retained. One cannot say that this is due to any fact which proves it to be the best position—in fact, one may say that it is the worst—but since the machines so fitted are among the most reliable, it would seem that the magneto has now reached a degree of weatherproofness that, from a mechanical standpoint, it is no longer necessary to consider its position.

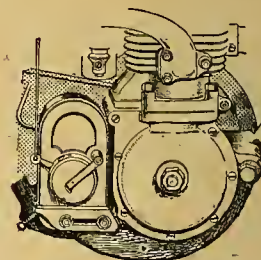
As regards the transmission, this is another matter. Reliability is only one point in efficiency, and as it is necessary for the spark to occur when the piston is at a



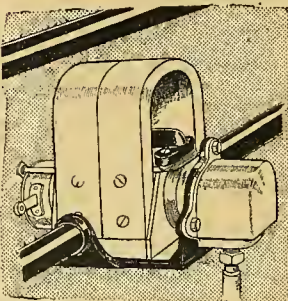
The Triumph, with chain-driven magneto at the front.



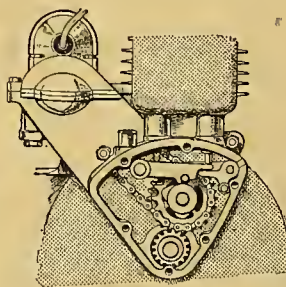
The Rudge magneto in front, driven from the cam wheel.



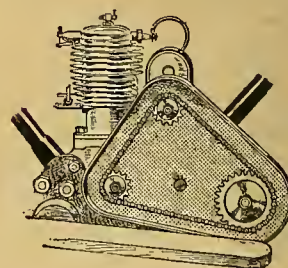
Rear position of magneto on the Velocette.



Magneto placed over the engine (in the tank), and driven by a vertical shaft, on the Bat.



The neat magneto chain drive on the 4 h.p. Star. The chain case is integral with crank case.



A single chain to drive magneto and gear box. The Grandex lightweight.



B.S.A. MOTOR BICYCLES

TESTIMONY FROM FRANCE.

"The B.S.A., as you know, is standard in the French Aviation, which has many hundreds in use. I must say the poor machines have, on the whole, a very bad time and are driven very hard—the majority of their drivers had no previous motor cycling experience, are rather careless and 'fast'—everybody seems to ride them and to learn to drive on them, including officers—nearly always a sidecar is attached. Despite such drawbacks it is marvellous how the machines succeed in performing useful work in despatch riding, postal service, provisioning, and conveying passengers. One may say now that, before the B.S.A., all sorts of machines had been tried from small twins to big American Motor Cycles, and that under such handicaps they all failed to be of any real use.

"In conclusion, I feel I owe a debt of gratitude to the machine which has carried me so faithfully, through fair and through foul, for two years of war. She is still sound although a little disreputable looking, as you will judge from the enclosed photos."

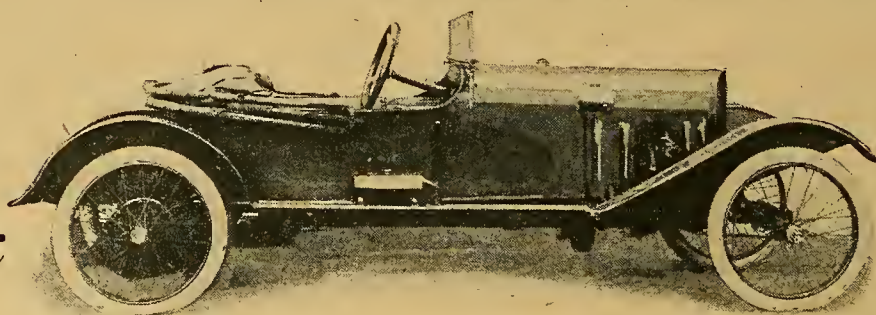
Yours truly,

ROBERT SEXE,

Motocycliste Etat Major.

Catalogue Post Free.

THE BIRMINGHAM SMALL ARMS CO., LTD.,
SMALL HEATH, BIRMINGHAM.



The 1919 G.N., True to Type.

The G.N. has always been a successful example of the simple and straightforward cycle car. Its design has always been based on sound and well-tried principles. As a result, it not only survives as a notable example of the simple and efficient type, but has, in some respects, been even further simplified and tidied up.

Specification.

ENGINE.—The engine is the 90° air-cooled twin, which has been fitted to the G.N. since 1912.

The G.N. engine is vibrationless, the running balance is superior to the balance of an ordinary four-cylinder engine.

Its two cylinders, 84 x 98, give a capacity of 1098 c.c., and the G.N. system of air-cooling, with deep cooling fins and arrangement of inlet and exhaust valves, gives excellent results. The engine is placed across the frame, and the cylinder heads and exhaust ports are very thoroughly cooled by the full and direct air draught.

A large external flywheel is fitted, and gives very steady running and slow pulling.

The rockers operating the over-head inlet valves are entirely enclosed in a neat casing, cast integral with the dome.

The cylinder heads are easily detachable, and their extreme accessibility enables carbon deposit to be removed in a few minutes.

The engine is mounted in the frame by a system of three-point suspension.

LUBRICATION.—G.N. system of semi-automatic pump, delivering direct to crank-shaft bearings, air-cooled sump to crank case.

TRANSMISSION.—Through 3-plate G.N. clutch to bevel-driven cross-shaft, thence by Renold roller chain to rear axle. Drive is taken through only one chain at once, and all changes are made by substantial hardened steel dog clutches. The transmission is simpler even than on the past Grand Prix models.

SPRINGS.—G.N. semi-cantilever springs with radius rods.

STEERING.—A neat steering gear box is fitted with bevel-gearing.

WHEELS.—G.N. detachable and interchangeable wire wheels, 650 x 65, with spare wheel and bracket.

WHEELBASE.—Standard 8ft., Vitesse 8ft. 6in., track 3ft. 6in., over-all length 10ft. 3in., width 4ft. 2in., height 3ft. 4in., with screen 4ft. 1in. Ground clearance, 9in. Weight, standard, 6½ cwt. Vitesse, 5½ cwt.

PRICES.—STANDARD model, without equipment .. £140 0

Ditto with complete standard equipment .. £167 10

VITESSE model, without equipment .. £170 0

Ditto with complete Vitesse equipment £195 0

FURTHER PARTICULARS, WITH FULL SPECIFICATION, TERMS, ETC., WILL BE GLADLY POSTED ON APPLICATION

G.N. LTD., ETNA WORKS,
ALBERT ROAD,
HENDON,
N.W.4.



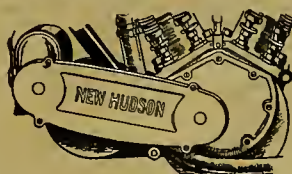
The Moto-Reve twin engine with gear-driven magneto at the front of the engine.

A certain amount of backlash exists also with a train of gear wheels, especially if they are incorrectly cut or are supported in bearings that are worn. Therefore it would appear that to overcome this the best form of magneto transmission for a four-stroke engine is a shaft directly connected to the magneto, and driven by a single half-time wheel off a pinion on the engine-shaft. This would eliminate all sources of backlash but one, i.e., between the teeth of the pinion and half-time wheel.

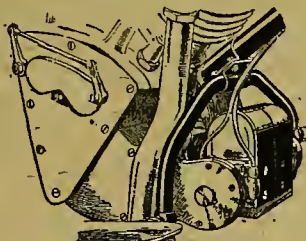
Probably this backlash is not a disadvantage sufficiently great for the designer to consider removing it altogether by fitting a flywheel type of magneto. Of late there has been a marked tendency for motor cycle designers to consider this system, and undoubtedly ere long we shall see flywheel magnetos on English machines. In these cases, however, as in those of American motor cycles fitted with them, increased efficiency has not been the chief consideration. Their introduction is due more to endeavours to reduce the cost of production.

When one reviews the variety of magneto positions in general use, the number is astonishing. First of all, there is the old conventional single-cylinder design, with the magneto below the front

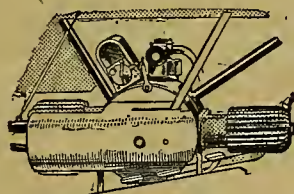
certain point in its stroke, any backlash on a chain would tend to alter the ignition timing at certain moments. This tendency must exist with a chain, however nicely it is adjusted, and the longer the chain is, the greater the tendency will be, because the drive is not always exactly positive.



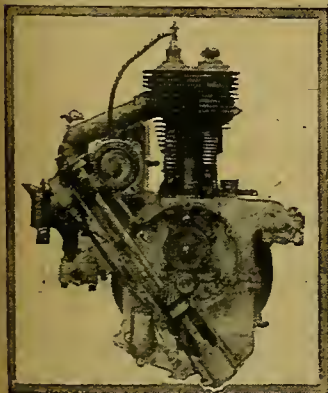
New Hudson twin with chain-driven magneto at the rear of the engine.



The American Excelsior twin with gear-driven magneto below the front down tube.



An American flat twin with diagonally placed magneto.



A shaft and worm-driven magneto on a single-cylinder engine—the 1914 T.T. Premier

down tube and driven by a chain, such as the Triumph, Ariel, Blackburne, B.S.A., Villiers two-stroke, Levis, L.M.C., Precision, etc. Then there are those with a chain-driven magneto at the rear of the cylinder, as on such designs as the Rover, Sunbeam, Alldays, and the Star.

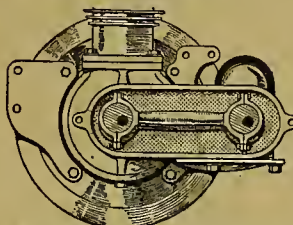
The Star design is interesting as showing a chain magneto transmission designed with a chain case integral with the crank case.

In twin-cylinder machines having chain-driven magnetos, the low front position was practically standard practice prior to 1915, as representative of which may be mentioned the J.A.P.

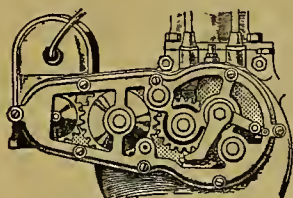
The Rex machine, however, had the magneto before the engine and within the diamond frame.

Since 1915 designers appear to have favoured the rear position. The Lea-Francis was one of the earliest V twins having the magneto behind the engine.

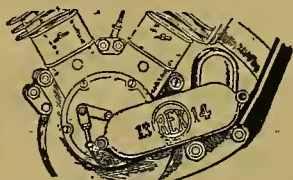
On the Sunbeam 8 h.p. military model,



An eccentric (l) drive suggested by a reader.



The gear-driven magneto at the rear of the Humber engine.

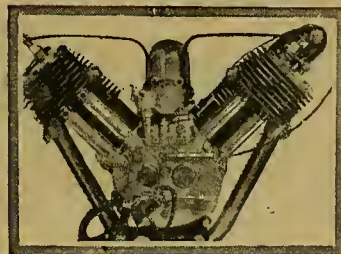


A Rex design, with chain-driven magneto in front, but inside the frame.

is transmitted to the magneto sprocket. Presumably, there would be a bearing to support this load.

After the chain, the gear-driven magneto is the next stage in development. Here, again, we find the position

of the magneto varies considerably. It is significant, however, that very few English designers have placed a gear-driven magneto in that low front position so common with those machines employing the chain. The W.D. single—an engine of very promising design—embodied this position and form of drive; while the M.M. and Excelsior American motor cycles also have a gear-driven magneto placed below the front down tube of the frame, but in English designs the gear-driven magneto is



The P. and M. twin with vertical shaft-driven magneto

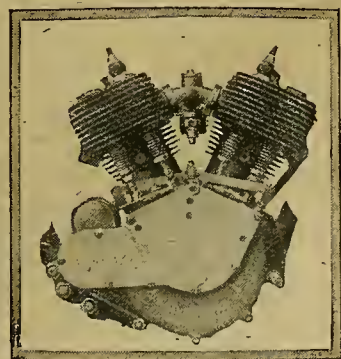
the magneto is placed high up in the diamond frame, and is supported on a platform carried by the rear down tube. Here it is certainly out of the way of mud and wet, but perhaps full accessibility of the rear cylinder valves has been impaired.

The A.J.S. design carries the magneto still further rearwards, the position being behind the rear down tube, where it occupies a space otherwise not used. In both these designs the chains seem to be somewhat long, and we may look to future models being modified to some extent in this respect.

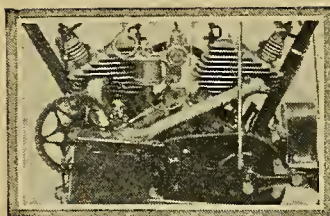
A neat design with a chain-driven magneto at the rear of the engine is the Alldays twin, in which the chain is enclosed in the integral timing case.

In the flat twin group, the only chain-driven magnetos appear to be the two latest horizontally opposed engines, i.e., the Victor flat twin engine unit and the Raleigh.

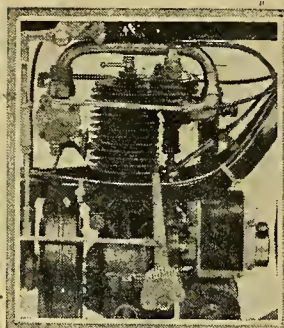
One of our illustrations depicts a magneto driven off the main transmission chain—that is, forming one point of a triangle. We cannot imagine this design being very satisfactory, as the entire "pull" of the engine



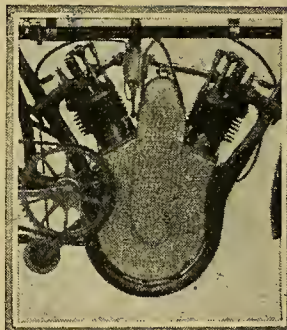
The Alldays twin, with enclosed chain drive for the magneto.



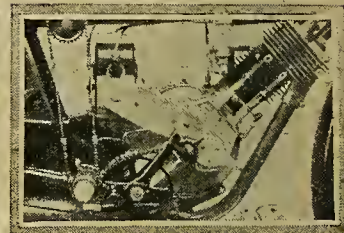
A M.A.G. twin with shaft-driven magneto at the rear.



The F.N. single with magneto in front, driven from the cam wheel.



A French twin with gear-driven magneto placed between the cylinders.



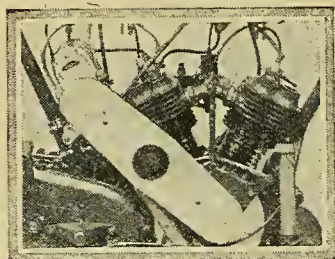
The P. and M. inclined engine with chain-driven magneto at the rear.

usually placed well above the centre of the crank case.

In the single-cylinder group, the James, Premier, and Clyno two-stroke designs have the magneto at the rear of the cylinder, employing a train of gears, of which generally the cam wheel is one. The Rudge, F.N. single, Bianchi (Italy), J.E.S., and Flying Merkel (U.S.A.) are among those having a gear-driven magneto in front of the cylinder.

In twins, the gear-driven magneto is not so common in English designs, but most American machines, both singles and twins, employ gear wheels.

The usual position of the magneto on American machines is at the front of the engine, but on English and Continental designs it is more often at the rear, while on the old Alcyon (France) a centrally placed magneto was gear-driven.



The 8 h.p. military Sunbeam, with chain-driven magneto at the rear. In this position the chain cover detracts from accessibility of the tappets of the rear cylinder.

The gear-driven magneto is general practice in opposed twin engines, the Raleigh and Victor excepted. Always the magneto is placed over the crank case, and, with one exception, in a vertical position. This exception is the American Bayley-Flyer, in which the ignition unit is inclined to the rear.

The shaft as a magneto transmission is not so uncommon as may be supposed. The 2½ h.p. Enfield, Motosacoche, Bat, Pope (U.S.A.), and the 90° twin P. and M. are among the twin engines employing it; but in the single-cylinder class the Diamond is the only English standard

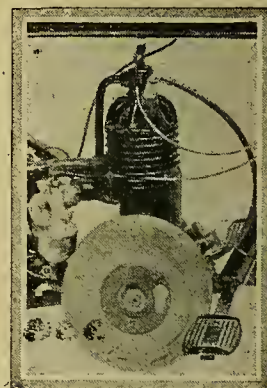
Probably the difficulty of placing a complete unit in the frame has much to do with the small number of English twin machines employing gears. The Premier 3½ h.p. even firing V twin embodied a gear-driven magneto, as did also the latest design of this concern's 7.9 h.p. engine. In both these designs the magneto was placed at the rear of the cylinders, while the Moto-Rève had a gear-driven magneto at the front of the engine.

magneto in a central position, and employs a vertical shaft and worm gear, which form of gear was also part of the design in the Pope and the Cleveland lightweight. In the Motosacoche, Diamond, and Bat designs, bevel gears were used, while the Puch has spiral gears.

It may be remembered that the Bat, which embodied a shaft-driven magneto, had the ignition unit right above the engine—in fact, in a chamber in the tank. Probably this was the only machine in which was revealed full appreciation of the necessity to keep the magneto clean and dry, at a time when most motor cycles had this delicate instrument placed within a few inches of the road.

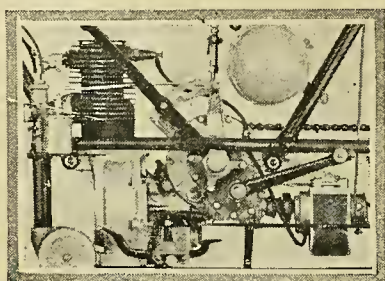
The variety of magneto positions and transmissions appears to have come into existence entirely on account of convenience. It is true that the low front position was due, in the first place, to the fact that it was practically the only position available on the machines, to which the magneto was fitted as an after-thought. The machines were not designed to carry a magneto, and it is certain that had it been necessary to apply power to the earlier ignition systems, frame designs would have been altered to accommodate them, when, in all probability, the low front position for the magneto would not have been considered.

In the meantime, there is no decided tendency toward any particular system of magneto transmission. It may be said that the chain appears to be most popular with designers, which probably is due to the extra cost of a train of gears, which, in addition, is difficult to make as silent as a chain.

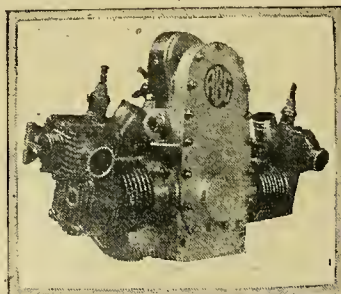


An American two-stroke lightweight with magneto flywheel.

VEDETTE.



The American Cleveland with shaft-driven magneto at the rear of the engine.



The conventional flat twin has a gear-driven magneto. In a few cases a chain is used.



The military model A.J.S., with magneto placed behind the seat tube and driven by a long chain.

Impressions of a Motor Cyclist Mechanic in India.

A Comparison of British and American Motor Cycles.

SGT. ALGY DENDY, writing from The Fort, Kohat, N.W.F., India, makes some enlightening remarks on the design and behaviour of machines on the Indian roads. In spite of the big pull American makes have had during the last few years in Overseas markets, the British motor cycle is still looked upon as the finest machine in the world, excelling in wearing qualities. Sgt. Dendy says:

"I have been sergeant-instructor in workshops attached to an armoured motor battery, and have had a good deal of repair work to do to motor cycles of both the two and four-stroke variety.

Dust and River Beds to Consider.

"Comparing the American motor bicycle with the British, it scores in comfort owing to its larger wheels and tyres, and its weight holds it down well. But it is tricky in the dust, and especially in crossing dry river beds. The controls to the gear and clutch are awkward when passing camel and mule convoys. Camel convoys number anything up to 200, and are usually in single file, which means a lot of gear and clutch work. On the narrow roads the heavy Americans want a lot of holding up, and their steering lock is much too small. Getting astride a Triumph after one of the big twin

Tappets on most engines are worn more than anything, the large type, such as fitted to the 1912 Triumph, being an exception.

"Bowden wires are not nearly hefty enough. Small two-strokes with no key-



Sergt. Algy Dendy,
M.M.C.C.

ways on which to fix the flywheels are an endless trouble. I have had to cut many keyways and fit keys before they would stop on.

"The most comfortable machine I have ridden out here is a 4.5 h.p. Zenith. This seemed so nicely balanced that it was like sitting in the middle of a sea-

saw, and that is just the thing for this district.

Exceptional Petrol Capacity.

"Undoubtedly the ideal machine for this part of the country for solo riding would be a W.D. Triumph, with 28 x 3 tyres, dust and wearproof tappets, and, above all, another type of spring fork. Also, tanks holding four and a half gallons of fuel would be a boon, as petrol is sold in four-gallon drums.

"For the sidecar, something very much more hefty in frames is needed, and, more than anything else, a spring sidecar wheel.

"Quite a nice testing ground here in the summer is the climb to the top of the Kohat Pass, rising 1,100 feet in seven miles, starting with a river bed crossing, and then about two dozen bends, very nearly hairpins, with overhanging rocks and precipices at the corners. These bends prevent speeding, and mean a lot of middle and low gear work, the sort of hill on which one would like a fourth gear—between top and middle.

An Opportunity for British Manufacturers.

"In conclusion, I might mention that most people out here prefer the British motor bicycle, but such are unfortunately



SCENES ON THE NORTH-WEST FRONTIER OF INDIA.



Americans is like mounting a racehorse after a draught horse.

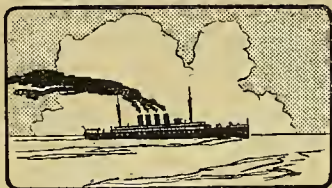
"Of the dozens of engines, both British and American, I have taken down, fully two-thirds suffer from the gudgeon pin being loose in the piston. The result of this is scored cylinders. Piston rings are too narrow for their grooves, and the ends of the step cut rings always disappear. Small end bushes are often loose in the connecting rod, and the rollers of big ends are worn into flats. Valves are always badly pocketed, and the stems worn on one side.

not always obtainable, and the Indian and Harley-Davidson have got a big hold. The British manufacturers will have to do something soon if they intend to get a hold on the market in the near future. It is a significant fact that almost any three-year-old English motor bicycle in moderately good condition will fetch more than a similar machine would cost new at the present time."

(Left) Camel convoys, sometimes numbering 200 animals, are frequently met with in the Frontier district.

(Right) On the top of the Kohat Pass—a climb of 1,100 feet in seven miles.

(Bottom) The summit of the Kohat Pass is reached by a road well graded but full of acute hairpin bends—a hill testing the ability of the rider more than the machine.



OVERSEAS SECTION



A Commentary based upon Practical Experience and a Study of Overseas Opinions.

Loading Up the Handle-bars.

It is noticeable that, while American manufacturers make a special point of keeping the handle-bars clear of all accessories, British manufacturers seem to take a delight in loading up the bars with all kinds of impedimenta—or, at any rate, forcing the owner of the machine to do so. This is a strong point in favour of the Americans, and every Overseas rider knows the nuisances that constantly crop up in the way of handle-bar fittings working loose. When the road conditions are really bad the bars are subjected to a good deal of jolting, which is rendered worse by the necessity for fairly stiff fork springs on Overseas mounts.

This loading up of the bars is a bad principle. In the case of a heavy sidecar machine it does not matter so much from a mechanical point of view, but it is calculated to upset the nicety of steering of a solo mount, besides subjecting the fittings themselves to a strenuous time.

The heavy speedometer, at least, might profitably occupy the position favoured by the Americans, namely, the top bar, and be driven from the rear wheel of the machine. In this position it is better insulated, and the distribution of weight is more as it should be. The road clearer might occupy the same position, as this top-heavy fitting is a chronic offender on the bars. The lamp must follow the steering head, and is not generally a cause of much trouble on the bars; also, since electric lighting is in the stages of rapid development, we can look forward to the weight of this accessory being much reduced.

The loading up of the handle-bars is a thing British makers who are interested in the Overseas market should avoid, or, at any rate, if we are to carry most of our accessories on the bars, let us have brazed lug attachments, so that when once fixed they remain there for good.



Fully-equipped Machines.

No one is better able to choose the accessories than the maker, and when a machine is turned out fully equipped proper provision can be made for the attachment of these accessories. But there are difficulties in the way. One rider states that half the fun of the game is lost unless a speedometer be used; another denounces this accessory as a useless extravagance. A speedometer is doubtless a valuable accessory to the systematic rider, but the fact remains that many do not require it. Similarly one rider puts his faith in one type of lamp and another in a different kind, so that it is an impossible problem for a manufacturer to turn out a fully-equipped machine that will meet the approval of all.

A good plan has been adopted by the Enfield Company—that of turning out two models, the one minus accessories and the other fully equipped.

The system of a fully-equipped model gives the makers an opportunity not only of employing the most suitable accessories, but of fixing them in the best way and in the best positions.



Weak Points. REAR stands, rear carriers, and mudguards still persist in breaking or dropping to bits under really severe conditions, and there is need for something in the way of a general revision if these items are to hold together indefinitely on military and Overseas machines. In some cases the carrier is dependent on the mudguard for the retention of its vertical position, which is quite wrong. The carrier should be a self-supporting structure, tending to strengthen and support the mudguard rather than the reverse.

Rear stands are not sufficiently strong, are made of the wrong material, and the stop is generally too near to the centre on which the stand pivots. The result is that when the machine, possibly facing uphill, is placed on its stand, the latter is slowly but surely bent at a point adjacent to the stop, till finally it gives way. The American military machines are provided with forged channel iron stands, which is a far more sensible plan, and might be extended to the rear carrier.

It is the excessive vibration which brings about the destruction of carriers and rear wheel mudguards. The front wheel gets less of it, since it does not follow the inequalities of the road so violently as does the back. It is consequently only a matter of time before the rear guard starts to give trouble, and, instead of being called upon to help support the carrier and stand, it should be supported by them.



Springing the Sidecar Wheel.

TAKING it as admitted that some yield is necessary in sidecars, we must then decide whether this be allowed for in the chassis design by the employment of curved tubes or whether the chassis be built on correct straight tube lines and insulated from the road by springing the wheel. It need hardly be pointed out which appears to be the better engineering principle. If triangular-straight tube design be employed the chassis can be constructed more lightly than if ordinary bedstead principles be followed, and by relieving both frames of intermediate breaking strains and shocks a further all-round reduction of weight would be permissible. Quite apart from this, a sidecar having an effective spring wheel is infinitely more comfortable than one solely dependent on the tyre for absorbing

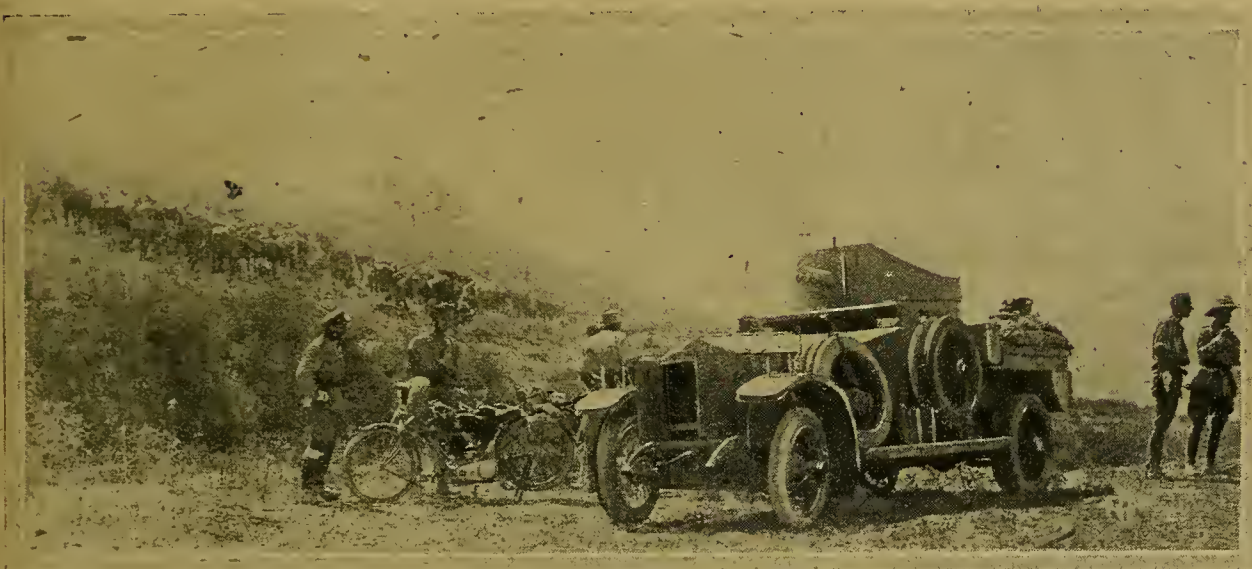
Overseas Section.—

road shock; indeed, the sidecar is the only self-propelled road vehicle designed for more than one rider that is dependent on such slender-provisions, albeit one of the fastest.

Quite apart from the questions of strength and comfort, the springing of the sidecar wheel would permit the convenience of a strong and roomy luggage grid and spare wheel carrier riding quite independently of the sidecar body. Unsprung luggage grids are

practically useless, and those attached to the body possess the disadvantage that arises from the springing of the body being unadjustable. Thus, with the grid fully loaded, springing designed to give maximum comfort under the normal conditions when only a passenger is carried is insufficiently stiff and *vice versa*.

It is sincerely to be hoped that sidecar manufacturers will give this question of springing their careful attention.



Despatch riders attached to a motor machine gun battery with their Triumph W.D. mounts in the hills of Samaria.

A Selection of Letters from Readers scattered all over the World.

British Motor Cycles Overseas.

A Canadian correspondent who is anxious to place British machines on the Canadian market writes: "I may say there is an ever-growing demand for motor cycles in Canada, and that the British machine is practically unknown. It is now, however, receiving more attention through the good reports of returned soldiers, who are loud in their praise of certain British makes. It is now six years since I left London to enter commercial life in Canada, and, undoubtedly, there has never been a period more favourable for the placing of British goods on the Canadian market than at present, with so many Canadian-born sons returning full of admiration for the Old Country and home products. As you are no doubt aware, there are no motor cycles built in Canada, America supplying the demands—a state of affairs which should not exist. With the preferential tariff and cheaper labour at home, the British-built machines ought to control the market here from Halifax to Vancouver."

An Ideal for India.

"SIND," India, writes: "I should be glad of information as to whether any make of motor cycle and sidecar combines all the requirements given below, which I consider essential to make motor cycling a success on our local roads. I have experimented with a $\frac{3}{4}$ h.p. Rudge-Multi, which has behaved wonderfully under impossible conditions, but it is held up by the worst roads.

"The roads are mere tracks, for the most part of hard clay full of holes, and with long stretches of soft sand.

"In places the roads are often flooded for long distances with water, and great power is required to plough through the thick sticky mud. It is never advisable to exceed 25 m.p.h., but it is frequently necessary to crawl for a mile at a time through deep holes at a speed of 5 m.p.h., and to do this without konking out the engine must be of fairly high power, and must be capable of running in the lowest gear for long periods.

"*Power.*—For machine with heavily loaded sidecar at least 6 h.p. is wanted, with a three or four-speed gear of substantial type, and with the lowest gear about 20 to 1. For preference, owing to its simplicity, a single-cylinder engine is preferred. The 5-6 h.p. Rudge should do well.

"*Ground Clearance.*—Nothing less than 8 in., and more if possible. This is not only for the machine but for the sidecar chassis.

"*Mudguards* with big enough clearance not to choke with the awful mud we have here.

"*Chain drive* or shaft drive essential. I find a belt takes one to the deepest part of the water, and then fails to grip, and leaves one stranded to get out as best one may.

"*Tyres.*—Certainly 28 in. x 3 in. on all three wheels, with interchangeable wheels. Punctures are frequent owing to the many acacia thorns, and it is advisable to have tyres that can be removed to repair punctures, easily and single-handed.

"The soft sand soon pulls the tyre round against the ordinary security bolt, and I have fitted 3 in. bolts to my wheels—five in each.

"*Sidecar.*—A roomy sidecar without fancy fittings preferable, and it is important that it should be fitted with a strong luggage carrier of large capacity.

"Other fittings advised are Rudge stand, powerful lamps, carburetter which will use paraffin, strongly sprung forks, and perhaps a spring frame."

Continental Desiderata.

A French rider, R. LEXE, Armée Française, says: "I would like to point out that the 4 h.p. standard type of English single-cylinder engine is the only engine which up to now has been made absolutely reliable and foolproof. With the twin one is continually bothered with the unequal oiling, unequal spring tension and valve clearance, unequal spark, air leaks, etc. What we want are rather improvements in frame design, better protection against mud and grit in the various bearings and spring forks."



SPECIAL FEATURES

MAGNETO DRIVE.

AUCTION OF W.D. MACHINES.
CHOICE OF A LIGHTING OUTFIT.

TIME TO LIGHT LAMPS

GREENWICH TIME.			
Jan. 30th	...	...	5.12 p.m.
Feb. 1st	...	...	5.17 "
" 3rd	...	...	5.20 "
" 5th	...	...	5.24 "

Anticipation.

A blue patch in the sky is sufficient to set one thinking of the joys of the wheel.

Motor Import Duty.

The gross amount received from the duties imposed on the import of motor cars, motor cycles, and parts during 1918 was £271,469, as compared with £288,347 in 1917 and £475,200 in 1916.

The Burney Brothers.

Capt. E. A. Burney, R.A.S.C. and Lt. C. S. Burney, R.E., are no longer connected with Messrs. Burney and Blackburne, Ltd., the makers of Blackburne engines. These well-known riders are forming a company composed of ex-officers and men of H.M. Forces who are expert engineers to open a motor agency in Scotland.

Motor Cycles in Canadian Police.

Montreal now boasts of the largest motor cycle police squad in Canada. It was only recently that the motor cycle was adopted by the Montreal authorities. The fleet now includes fifteen Henderons and twenty-five Harley-Davidsons; while the Toronto police department has a large fleet of motor cycles, including Triumphs.

The Industrial Reconstruction Council.

The third lecture of the series arranged by the Industrial Reconstruction Council will be held in the Saddlers' Hall, Cheap-side, E.C.2, on Wednesday, February 5th. The chair will be taken at 4.30 by the Right Rev. the Lord Bishop of London, and a lecture, entitled "The Industrial Awakening," will be delivered by Mr. Ernest J. P. Benn, chairman of the Council. Applications for tickets should be made to the Secretary, I.R.C., 2 and 4, Tudor Street, E.C.4.

The British Overseas Market.

A correspondent from Lagos, West Africa, who is an enthusiastic rider, writes: "I have your interesting paper sent out every mail, and find it most useful and instructive, and should like to point out, with regard to the controversy 'British v. American machines,' that our manufacturers will have to wake up now, otherwise the colonial market will be lost to them. The Americans have 'got in,' and undoubtedly turn out a much more suitable motor cycle for colonial work than the British."

Greetings from Overseas.

We have received a Christmas greeting card from Lt.-Col. S. W. Carty, M.C., R.A.S.C., who is now in Mesopotamia. Lt.-Col. Carty will be remembered as a prominent member of the Newcastle and Mersey Motor Clubs.

E. African Campaign.

The South African D.R.'s who were with the Forces operating in East Africa against the Germans have now returned home, but the D.R.'s from Great Britain are still "up country"—in Portuguese East Africa in fact—where they are busy "clearing up."

Spring and Semi-spring Frames.

It is obvious that the rigid frame with conventional saddle is regarded as out of date by a large number of motor cyclists. In the "Which Type" referendum the voting on these points showed that the ordinary type saddle was specified by a smaller number of readers than those who voted for spring frames. Rigid frames secured 21.1% and 15.2% votes in solo and sidecar classes respectively; sprung saddle-pillar and semi-spring frames together obtained 22.8% and 19.3% in solo and sidecar groups respectively.

In Season.

Mud and rain and hard thoughts concerning mudguards.

American Motor Cycle Police.

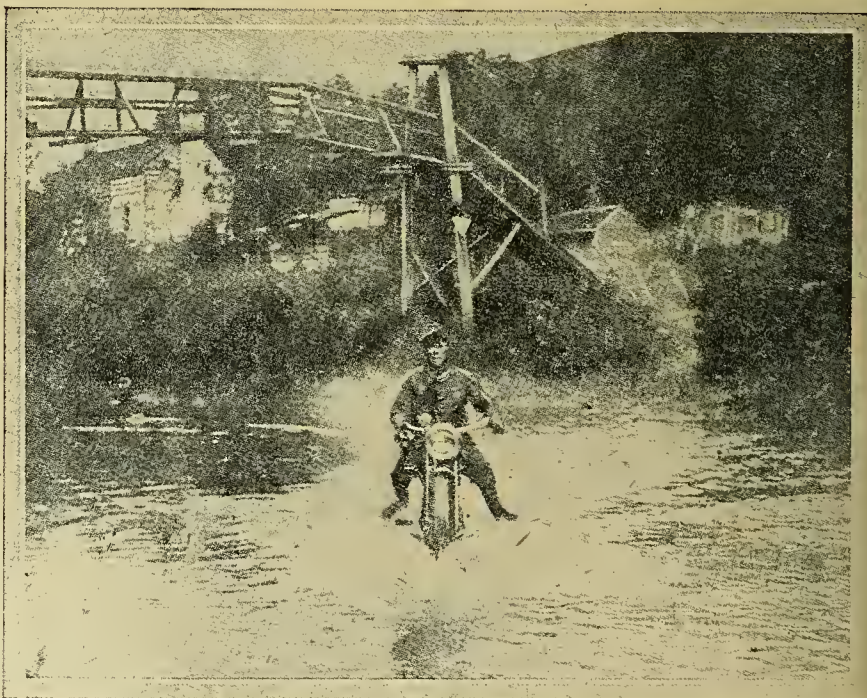
The Detroit (Mich.) traffic police are for the third year equipped with forty-seven electrical model Henderons.

Poor Benzole.

We have heard several complaints as to the quality of benzole produced. Although in these days it is unreasonable to expect spirit of pre-war quality, it will not benefit the benzole producers in the long run to continue supplying inferior quality. Motor cyclists trying this fuel for the first time will be strongly prejudiced against benzole as a fuel. And prejudice dies hard.

The D.R.'s in Africa.

Cpl. Syd. Du Rose, writing from East Africa, says: "I still continue to receive the copies of *The Motor Cycle*, and it is a treat to receive them and read the latest motor news of Old-Blighty. B.S.A.'s are still hard at work out here. No other motor cycle could stand the thrashing that a B.S.A. gets in East Africa. It is a wonderful 'bus for rough riding."



This is not a "tester's stunt," but one of the innumerable creeks motor cyclists have to contend with in all Overseas countries. No wonder that high ground clearance is always stipulated in Overseas specifications.

The Latest Spring Frame.

The 1919 No. 7 Chater-Lea will have a spring frame.

The Inventor of the Exhaust Lifter.

We are asked to name the inventor of the exhaust valve lifter. This was Mr. A. J. Wilson, who, as a motor journalist, is known as "Faed." Incidentally, Mr. Wilson was author of the first edition of "Motor Cycles and How to Manage Them," published from these offices.

T. Silver, of Quadrant Fame.

Many readers, in company with ourselves, will be pleased to hear that Mr. Tom Silver, after having undergone a serious operation, is making satisfactory progress. We trust that the rejuvenating air of Buxton will accomplish a speedy convalescence, and that, before long, he will be again moving in Quadrant circles with all his accustomed health and strength.

For the Consideration of the Trade.

At the present time there is an undoubted demand for a two or three-speed gear which can be fitted to fairly modern $3\frac{1}{2}$ h.p. single-cylinder machines. For the next six months, and until manufacturers have got into full swing, there is plenty of work to be done by clever amateurs and motor cycle repairers in converting old single-speed machines into really satisfactory sidecar mounts.

Reviews of Design.

In this issue we include another of our reviews of current design, which have been appreciated so much by readers. This article reviews magneto drive and position. A list of previous articles is given below:

	1918
Timing Mechanism, Single-cylinder Engines	May 23
Timing Mechanism, Twin-cylinder Engines	July 11
Frames and Tanks Integral	May 30
The Side-by-side Twin Engine	June 6
Flat Twin Two-strokes	June 20
Three-cylinder Engines	June 27
Four-cylinder Motor Cycles	Aug. 1
The Motorised Bicycle	Aug. 15
Three-wheeled Cycle Cars	Sep. 12
The Water-cooled Motor Cycle	Oct. 3
Braking Systems	Oct. 10
Spring Frame Motor Cycles	Nov. 7

New A.B.C. Sidecar.

Mr. Granville E. Bradshaw is reported to be busily engaged upon designing a specially light sidecar for the new 400 c.c. A.B.C. motor cycle.

A T.T. Race in 1919?

There is just a bare possibility that a T.T. race will be arranged this year. It appears that the condition of the roads in the Isle of Man at the present time, and the uncertainty as to whether they can be put into proper order in time, prevents a decision being reached. Ireland is the only alternative.

Wanted, a Modern Engineering Factory.

A prominent Midland firm of motor cycle manufacturers are experiencing such a flood of orders for new mounts, far beyond the possible output of their factory, that they are desirous of getting in touch with an engineering firm of repute, with an up-to-date plant, who wish to turn from munitions to work of this class, and who will guarantee a supply to specification, probably running into thousands of machines. We shall be pleased to facilitate communications.

Testing Norton Engines.

Mr. D. R. O'Donovan, the well-known speed specialist, is again in charge of the Norton Motors testing department, and he will be personally responsible for the riding in the firm's engine speed tests on the Brooklands track. The certificate of the Brooklands Auto Racing Club will be given with each of the special engines for T.T. and B.R.S. models, guaranteeing that the engine has exceeded 75 m.p.h. for a distance of one kilometre. We are assured that there is just sufficient of the track left with a rideable surface to enable this testing to be carried out.

**THE DISPOSAL OF
ARMY MOTOR CYCLES.**

The exposure in these pages and those of our sister journal "The Autocar" of the scandalous neglect of army motor vehicles at Kempton Park and other army supply dumps has had the desired effect.

A special Department at the new Ministry of Supply has taken over from the Surplus Government Property Disposal Board the sales management of all Government motor vehicles, and it is stated that Maj.-Gen. Sir C. R. Crofton Atkins has been appointed to take charge of the new Department.

It is said that manufacturers will be given an opportunity to repurchase machines of their own make. If they refuse to buy, or their offer is not deemed sufficiently good, the vehicles will be offered to the public.

Sales of a few machines have already taken place at Aldridges, St. Martin's Lane, a report of the first of which, together with photographs, appears on page 116.

Three-wheelers in Prospect.

More attention seems to be centred on three-wheeled vehicles for this year than has ever before been the case. We know of four firms who are considering designs for three-wheeled vehicles, and there are a great number of rumours that other prominent manufacturers are considering this type favourably.

Six Days Trial in August.

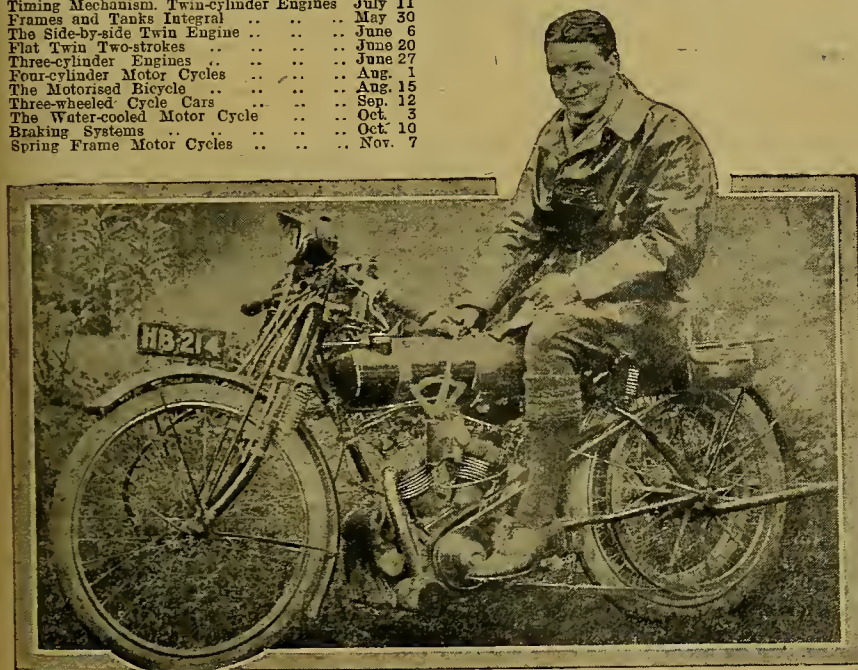
It may be taken as practically definite that an A.C.U. six days reliability trial will take place in August this year. The course suggested is a new one, and will possibly be from a centre, as in 1914. By August all manufacturers should be in a position to enter either their current or 1920 models. In either case, the importance of some strenuous test is recognised by everyone.

Precision Engines.

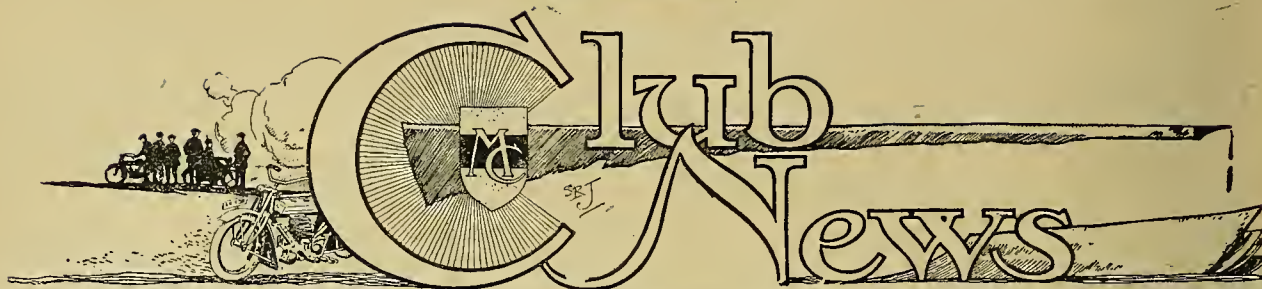
Precision engines for 1919 are now announced. Two models are being introduced. These are an 8 h.p. twin following the general lines of the 1915 model, but with improved and silent valve gear, new exhaust valve lifter mechanism, and roller big ends; and a $3\frac{1}{2}$ h.p. single-cylinder two-stroke of 350 c.c. capacity, with many unique features, including roller big end and main bearings, and automatic lubrication. We hope to describe both models shortly.

We are not so Militarised as the French.

Numbers of French motor cyclists were mobilised in the early days of the war, and the scheme included the calling up of machines as well as riders. These machines were requisitioned by the Government at one-third of their original value. Machines have gone up so much in value that French motor cyclists are now suggesting that they should be allowed to repurchase their machines from the State on being demobilised, and should obtain preferential treatment in the question of the price of repurchase. British despatch riders have made the same suggestion.



In spite of the thrills and excitement aviation offers, Lt. Owen Edmunds, who made the first official mail flight between London and Paris, still retains his affection for the motor cycle. His mount is a 5.6 h.p. overhead valve N.U.T.-J.A.P., with three-speed hub gear. Lt. Edmunds has made over 200 Channel flights.



The Latest Information regarding the Revival of the Various Clubs.

The Motor Cycling Club's Activities.

This year's programme will include a despatch riders' trial, the opening run, and the annual London-Edinburgh run, but further news of the club's activities will be given later.

Chester and District M.C.C.

This club has not yet been reorganised, as most of its members are still away on military duty, including the secretary, Mr. R. Dutton, who is in East Africa.

Birmingham M.C.C.

The Birmingham M.C. Club's 1919 programme promises to be a very attractive one. It is proposed that the local clubs may reopen motor cycling competitions by having an inter-club trial.

Mansfield and District M.C.C.

Energetic motor cyclists in the Mansfield district should get together to revive the local club. The late secretary, Mr. C. Evinson, of the Portland Motor Co., advises us that he will not have time to devote to it.

Dublin and District M.C.C.

Mr. W. H. Freeman is again holding office as hon. sec., and four road events for 1919 have already been decided upon. A reliability trial for the Dunlop cup will be held on Easter Monday, another trial on Whit-Monday, a twenty-fours trial at the end of June, and a two days' trial on the Saturday and Monday of August Bank Holiday.

Liverpool M.C. Redivivus.

We are pleased to note that the trustees of the Liverpool Motor Club have decided to resume activities by holding a public meeting at 7.30 p.m. on February 5th at St. George's Restaurant, Redcross Street, Liverpool. Other local clubs would do well to follow their example, as there are so many problems of vital importance to the motoring community at the present time that can be better dealt with collectively.

Portsmouth Branch of the N.M.C.F.U.

On Tuesday evening, January 21st, a very successful and well-attended meeting of the National Motor Cyclists' Fuel Union, Portsmouth Branch, was held at headquarters, "Blue Anchor Hotel," Kingston Cross. The newly elected chairman, Mr. Cheyne, spoke of the future business and social prospects of the club, the evening terminating with a smoking concert.

Essex M.C.

A meeting is to be held at the Eagle Hotel, Snaresbrook, to decide upon the future activity of the club. It is intended that a strong programme, of both sporting and social events, shall be carried out, the club being in a strong financial position. Old members and intending members should communicate with the hon. sec., D. S. Kapadia, Holme Villa, Algers Road, Loughton, Essex. The date of the meeting is not yet settled.

Bolton and District M.C.

The Bolton and District Motor Club, which, in common with other motor clubs throughout the country, was compelled to suspend its activities in the early days of the war, is to be reorganised almost immediately. The first general meeting for the new season is arranged to be held at headquarters, the Swan Hotel, Bolton, on Thursday, February 13th, at 8 p.m. prompt. Other intending members would greatly assist the secretary by paying their subscriptions to him at 215, St. George's Road, previous to the general meeting.

Bristol Wheelers Cycling Club.

A meeting of the Bristol Wheelers' Cycling Club will be held some time in February, when a programme will be arranged for the motor cycle section.

Nottingham and District M.C.C.

A most comprehensive programme has been drawn up, and motor cyclists desirous of joining should communicate with the hon. secretary, Mr. H. Weldon, at the Welbeck Hotel.

Woolwich, Plumstead, and District M.C.C.

There is a strong feeling amongst the members of the Woolwich Club that active operations should start as early as possible, and a "victory" competition is among the events being planned.

Plymouth and District M.C.C.

Secretary T. D. A. Chapman advises us that at present the majority of the Plymouth Club members are scattered all over the world in His Majesty's Forces. The revival of this club is not likely to be so soon as its ex-members would desire.

Sheffield and District N.M.C.F.U.

We hear that the Sheffield N.M.C.F.U. intends providing co-operative garages in different parts of the town for its members, built on similar principles to those described by "F.A.S." in our Reconstruction Number of January 2nd.

Despatch Riders' Club.

A club has been formed to perpetuate the comradeship of motor cyclists who have been R.E. despatch riders. Such riders are invited to communicate with the temporary hon. sec., Signal Service Despatch Riders' Club, R.E. Depot, Wellingborough.

Middlesbrough and District M.C.C.

It is intended to restart this club at an early date. A general meeting will be held about the end of February. In the meantime, Hon. Sec. Jas. Gilchrist, 3, Roman Road, N. Middlesbrough, appeals to all motor cyclists in his district to associate themselves with the club.

Cork and District M.C.C.

A general meeting for the election of officers for the coming season is fixed for February 5th. It is anticipated that a full programme of events will be possible during 1919. Two members of the club have recently appeared in the *Gazette*—Capt. J. W. Payne, of the Connaughts, has been awarded the Military Cross, and Capt. W. J. Morrogh, M.C., of the Northumberland Fusiliers, the Croix de Guerre. Capt. L. D. Humphreys, the first Cork motor cyclist to join up, was taken prisoner in the first months of the war, and has now arrived home. The hon. sec. of the Cork M.C.C. is Mr. Ronald S. Russell, 4, Prince's Street, Cork.

Auto Cycle Union.

At a meeting held in London last week it was decided to make the subscription 10s. for all individual members. Members will henceforth be of one grade. The scheme comes into operation as and from March 1st. The arrangement will not affect those touring members who have paid their 5s. membership fee; and those who have paid a guinea will not be asked for another subscription for the next two years. Members affiliated to the A.C.U. through their local clubs are not affected by the new scheme.

The annual general meeting of the A.C.U. will be held at Birmingham on Saturday afternoon, March 22nd, and will be followed by a conference of members of affiliated clubs and local motor cyclists.

Club News.—

The British Motor Cycle Racing Club.

Old members of the B.M.C.R.C. are asked to communicate with the secretary, Mr. T. W. Loughborough, 83, Pall Mall, London, S.W.1, to join in an early effort to revive the club.

A Proposed Motor Cycle Club for Hull.

Great interest is being shown in an effort to form a motor cycle club for Hull, and local motor cyclists interested are requested to communicate with Mr. Fred Hall, 1, Margaret Street, Hull.

Wath and District M.C.C.

The Wath M.C.C. is one of the few clubs which have been able to "carry on" during the war. Secretary W. W. Evers (Sandygate) advises us that he has funds in hand, and that many members have already paid their subscriptions for 1919.

Eastern Counties M.C.

A meeting is being arranged by the hon. secretary, Mr. J. W. Percival, 5, Ruby Road, Walthamstow, in order that the Eastern Counties Motor Cycle programme may be arranged. Old members are asked to communicate with the secretary.

A Belgian Motor Cycle Club.

The Federation of Belgian Motor Cyclists is holding a preliminary meeting shortly, and every effort will be made to revive motor cycling. One of the evils the Federation is out to combat is the carrying of two enormous number plates, which Belgian motor cyclists find a great inconvenience, and every effort is being made to adopt the British system of numbering.

A SPARKING PLUG WITH DETACHABLE ELECTRODE.**The XL-ALL—A Newcomer to the Sparking Plug Industry.**

ONE of the chief faults of plugs is the difficulty in cleaning their interiors. It is not sufficient to remove the carbon "bridge" across the electrodes; a film of carbon is deposited over the whole internal faces exposed to the explosions. This can be only partially cleaned away by washing out with petrol, in even the best of plugs. In fact, many of the best plugs seem to be the worst offenders in this respect.

With these facts in mind, the XL'All Co., Ltd., of Hall Green, Birmingham, makers of the well-known XL'All saddle, have designed a plug, the first and foremost advantage of which is the ease with which it can be dismantled, the central electrode being withdrawable, and every surface needing cleaning exposed. The body of the plug is of usual dimensions and case-hardened, with four hexagonal cooling fins formed with the outer electrode out of the solid. This construction leaves a small aperture, through which the central electrode projects, thus forming the spark gap. The porcelain, in two parts, and the nickel central electrode are locked up in the one unit with a second and upper body of smaller diameter, which also has four hexagonal cooling fins, and is threaded into the lower part. The joint is made with a copper asbestos washer, thus merely making an exact replica of the ordinary plug joint with the cylinder or valve cap.

The construction of the insulating porcelains and the central electrode is particularly designed to obviate any leakage, and an extremely fine degree of accuracy in workmanship is to be maintained to ensure perfect joints and concentricity of the electrodes, thus giving an unvarying spark gap no matter how many times the plug is taken apart.

We are told that exhaustive tests have proved this plug to be remarkably efficient. It has been tried in a variety of machines, including two-strokes, big V twins, and even a works gas engine.

Although of special construction, it is to be put on the market, almost immediately, at a very reasonable price—in fact, much cheaper than many special types of plug.

**N.M.C. Fuel Union.**

A social evening of the above Union will be held in the Athenæum Room of the Royal Hotel, Derby, on Saturday, February 1st, at 7.30 p.m. An address will be given by Mr. E. S. Shrapnell-Smith, C.B.E., deputy director of Technical Investigation, H.M. Petroleum Executive.

The Cyclecar Club.

In order to restart the Cyclecar Club, a committee meeting will be held at the R.A.C., 83, Pall Mall, on Friday, February 7th, at 8 p.m. Various important matters will be discussed, including a change of title, subscription, and other proposals to be submitted to a special general meeting to be held at a subsequent date.

Ladies' Club in Coventry.

It is thought that there are sufficient lady motor cyclists in the Coventry district to form the nucleus of a ladies' club, and several keen riders of the gentler sex are desirous of forming such a club. Those interested are invited to communicate with Mrs. H. Williams, 76, Sir Thomas White's Road, Coventry.

York and District M.C.C.

Mr. G. A. Reed, 6, Blake Street, York, the captain of the club, is acting secretary *pro tem.* pending the election of officers at the general meeting, which, it is hoped, will be held at the York Station Hotel, on Wednesday, February 26th. No definite programme has been decided upon so far, but it is thought that social runs on alternate Wednesday and Saturday afternoons will be a regular feature, while several trials and hill-climbs are in contemplation. All local motor cyclists should get in touch with Mr. Reed.

LONDON'S APPROACHES.

The scheme for the construction of a new western road from London, which was on the tapis before the war, is being revived, and it is hoped that some definite decision may soon be reached. The engineering difficulties are negligible, and the question now resolves itself into one of finance and arrangements with the number of local authorities to be considered. We hope to hear more of this in the near future.

THE PETROL POSITION.

It is a relief to note that there is some prospect of improved fuel in the near future. The Government has in stock a considerable quantity of special aviation spirit, which is to be mixed with No. 3 spirit in such quantities that the mixture will represent a good petrol of No. 1 quality, which is promised at 3s. 3½d. a gallon.

Possibly the fact that it is not always possible to obtain petrol in some districts may give rise to the idea that there is still a national shortage of spirit. This is not the case, however, as local shortages are brought about by inadequate transport facilities.

B.S.A. PLANS.

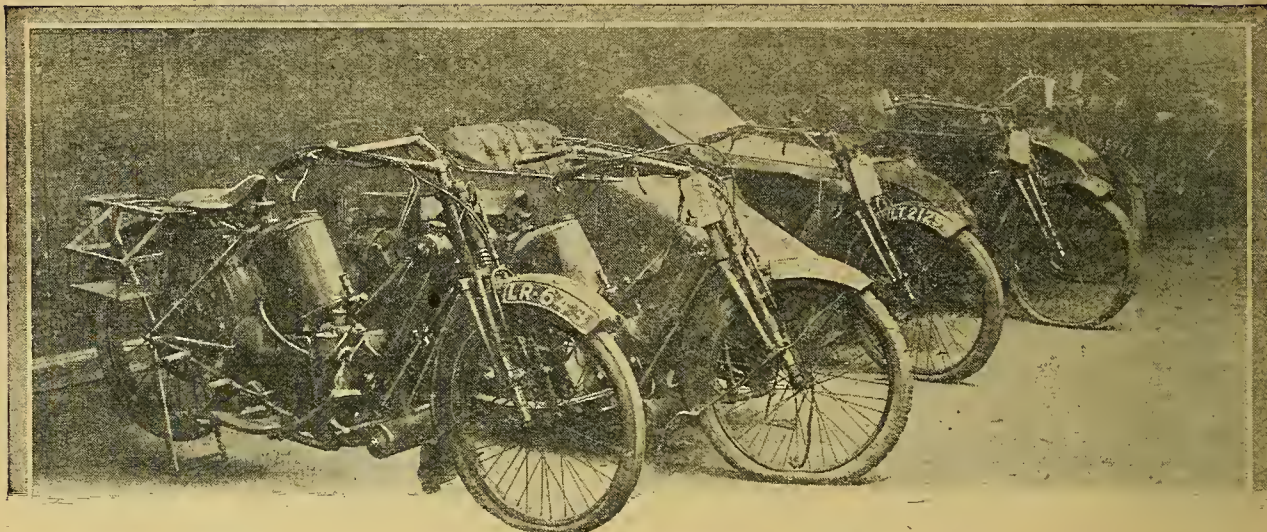
In future the manufacture of B.S.A. motor cycles and bicycles will be run by a company separate from the Birmingham Small Arms Co., Ltd., which will be known as B.S.A. Cycles, Ltd. Mr. C. A. Hyde, the manager of the cycle and motor cycle departments of the parent concern, will be managing director.

Mr. Hyde is one of the best known figures in the trade, with which he has been connected for over thirty years. He invented the Hyde free wheel, which is now a universal fitment on pedal cycles. He is president of the Cycle and Motor Cycle Manufacturers' and Traders' Union, member of the Council of Federation of British Industries, member of the Executive Committee of the Association of All British Motor and Allied Manufacturers, member of the Local Advisory Committee to the Ministry of Labour, and chairman of the Executive Committee of the Engineering and National Employers' Federation (Birmingham District).

Now that the Government contracts are about to terminate, the whole of the enormous surplus factory space and plant will be adapted to the construction of cycles and motor cycles on a scale hitherto unprecedented.

W.D. Surplus Stock under the Hammer.

Last Week's Sale of Government Motor Cycles.



Some of the Scotts. These machines fetched quite good prices

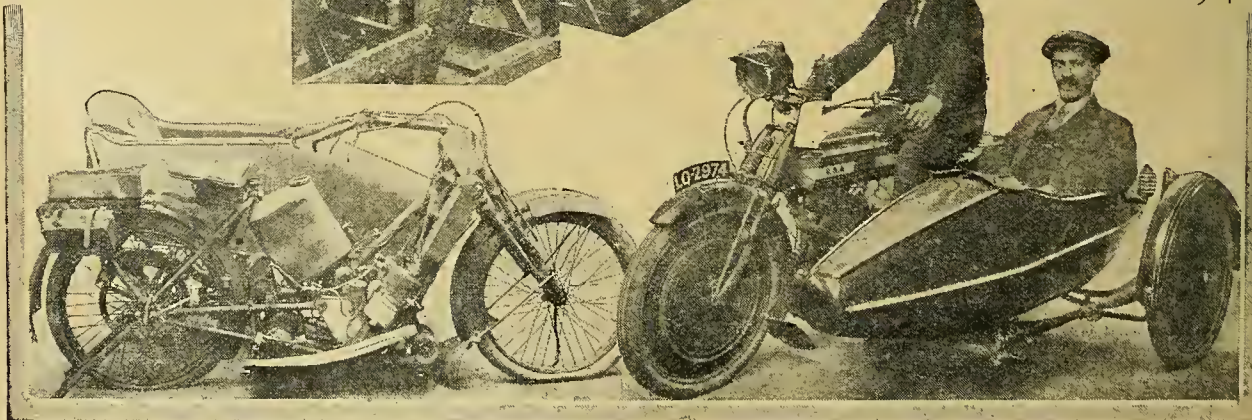
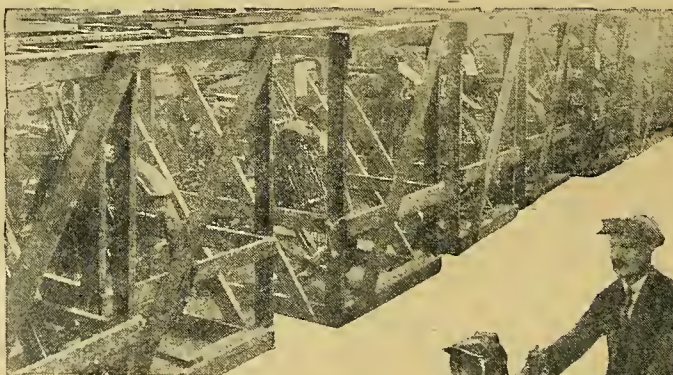
THE first sale of Government motor cycles took place at Aldridges on the afternoon of the 22nd inst. Altogether nineteen machines were sold, consisting of Rudge-Whitworths, Zeniths, Rovers, and Scotts. There was a large number of bidders, consisting chiefly of dealers, but a number of young officers in khaki were conspicuous in the crowd.

Remarkably good prices were obtained; the Rudges fetched between £37 and £39. Five Zeniths were sold at an average of £42, the lowest price obtained being £39 and the highest £53. These machines were sold as being in fit condition. Unfit Rovers made from £24 to £33, while the Scotts, which were not in particularly good condition, were sold at prices ranging from £26 to £43.

Besides the lot of Government machines there were sold a 1915 $4\frac{1}{4}$ h.p. B.S.A., with sporting sidecar and disc wheels, guaranteed in working order, which fetched £74, and a Triumph combination which went at £26.

It is interesting to compare these prices with the average second-hand prices published in last week's issue, remembering that the sellers in these cases were private owners. Among the surplus machines at Kempton Park are a number of the following makes: Lea-

Francis, A.J.S., Enfield 3 and 6 h.p., Nut-Jap, Singer, Premier, Matchless, Bat, Rex, Regal, Motosacoche, Levis, P. and M., Sunbeam, and Bradbury. A large number were privately owned machines which were taken over by the Government in 1914.



(Top) A batch of Rudges and Rovers which had been renovated in Government repair shops. (Left) A mutilated Scott, which was nevertheless sold for a good price. (Right) A privately-owned $4\frac{1}{4}$ h.p. B.S.A. sidecar, which found a buyer at £74.

OPINIONS.

Notes on the Past, the Present, and the Future. By Prominent Men in the Motor Cycle Movement.

CONCLUDING SERIES:—Comments of Competition and Other Well-known Riders.

From Mr. Frank Whitworth, Prominent in the Birmingham Retail Trade, Popular Clubman, and Successful Competition Rider.

TO set down all the thoughts that occur to one relative to the "re-construction" position and future possibilities of the motor cycle would occupy more space than is at my disposal. First, as to quantities, the possibilities seem almost boundless. Why should not everyone in Great Britain have a motor bicycle—everyone between, say, the age of nine and ninety? This would enable



Mr. Frank Whitworth.

some decent-size outputs and some real quantity production. Yes, enormous expansion in quantity is the first probability that strikes one in relation to the future of motor cycling, though perhaps not to quite the extent I have suggested. Next, as to the future type, there is one point that impresses me more than any other; the type is no more fixed to-day than it was in the first and false boom of 1904, nor in the second and genuine boom of 1910. "Producers and users were, in those days, uncertain and wavering between different types of engines, transmissions, and frames, and to-day they are still as doubting and undecided. Indeed, the manufacturers are, apparently, so far as the bulk of them are concerned, feeling less decided in their steps to-day than they were in 1910.

In 1910 practically every one of the big makers who then stepped into the trade, mostly from the pedal cycle ranks, followed a certain well-known and successful lead, and produced a $3\frac{1}{2}$ h.p. single-cylinder diamond-framed machine. It is probable, if the dozen biggest makers of the years 1910 to 1914 were tabulated, it would be found that two-thirds of them produced machines of that type. The general opinion seemed then to have settled on the 500 c.c. single-cylinder as the desideratum of the motor cyclist.

Even to-day it is probable that, of the existing big makers whose names are best known to the public, the majority are still principally working upon the same lines. But I submit that the average motor cyclist and the average manufacturer are not to-day feeling even so confident of the trend of future design as in 1910.

New concerns are organising in the background, recruited from entirely different sources. For whereas the older

motor cycle firms mostly sprang from pedal cycle origin, some of these are coming from the aeroplane industry, and they approach the subject of motor cycle design from an entirely new standpoint. Their constructive ideas begin with the engine, and then work through to the suitable transmission, frame, etc.; the older school started with the bicycle, and the engine came later for adaptation to the bicycle. With the two schools competing we shall get some improved results from both, particularly in the direction of decreasing weight whilst maintaining power.

New concerns are coming, and are already making claims for the future of their new types of machines. They assert they can give increased general suitability and efficiency for the purpose for which the motor cycle is required, namely, the safe, certain, speedy, simple, comfortable, and economical transit of one or perhaps two persons from one point of the country to another.

From Mr. W. B. Gibb, the Gloucester Agent, who is perhaps better known as a Successful Competition Rider.

IF there is one point more than another which I may criticise in the present-day motor cycle, it is that of the inadequate protection from mud.

The war has certainly brought out the weak spots of the motor cycle, several of which the manufacturers have remedied—much to their credit. Happily we already see signs of improvement—in giving more clearance between wheels and mudguards, thus obviating the necessity of the rider dismounting to remove the mud with a stick from time to time.



Mr. W. B. Gibb.

Clearance, however, does not prevent the rider from being plastered from head to foot in mud, after a few miles on such roads as we have had in the last few weeks.

Many riders will agree that it would be to the mutual advantage of businessmen and the trade generally if this drawback could be remedied at an early date. The former recognise that they must arrive at their client's residence in a presentable condition. We see from time to time many home-made devices to protect the rider; but why should this be necessary? Surely manufacturers are in a better position to devise some adequate means of protection for the rider, and thus obviate the necessity to don overalls when making business calls at distances of a few miles.

Manufacturers have done well in developing the power unit during the last few years, and I, for one, feel confident they can do equally well in regard to the question of mudguarding, if they will only definitely lay themselves out to tackle this problem, that is undoubtedly requiring urgent attention.

From Mr. Hugh Mason, Winner of the 1913 Junior T.T.

FOR four years the ever-increasing demand for munitions has gradually organised rapid, accurate, and massed productive methods which were practically unknown before the war. This and the testing and treating of material, together with the extremely fine limits of tolerance in the gauging and inspection departments, must surely prove extremely beneficial and a lasting education to those called upon to resume the manufacture of motor cycles.

From the manufacture of munitions of war to motor cycle manufacture without notice (as it must be if we are to produce

for Easter) is indeed a problem of vital importance to all concerned. However, when the time comes, of one thing I am surely certain: machines may not be cheap in one way, but the motor cyclist will get better value for money than ever before, as a machine manufactured upon up-to-date methods necessitates that all parts must be interchangeable to the last degree. Again, all working parts, including nuts, etc., must be hardened, and suitable set spanners supplied; also larger tyres, more efficient mudguarding, dynamo lighting, automatic and semi-automatic lubrication will be required, and the whole machine made generally more durable throughout.

I am of the opinion that fewer models will be manufactured, possibly only two, viz., lightweight solo and sidecar combination. The latter calls for the more improvement, inasmuch as drivers will require much more protection than formerly, or they may quickly become light car owners. Open frame ladies' machines will not be demanded, as the fair sex, having responded to the nation's call, have consequently become more sporting; and, suitably clad, they will prefer the standard and more rigid type of frame, particularly as this standpoint will enable them to use any make or model, solo or sidecar, which comes their way.



Mr. Hugh Mason

Opinions.—

From Mr. Fred Dover, the Coast Rider, of Sheffield.

DURING the last three years I have been driving an American 7 h.p. twin three-speed countershaft model, and have always been able, up to the last few months, to get any part I required. Although the machine has its drawbacks, I have every reason to be well satisfied with it.

I consider that unless manufacturers pay great attention to working on standard lines, and to secure the easy purchase of spare parts (and the said spares to fit when secured), they will be left behind.

With regard to future competitions, I think from a sporting point of view they will be uninteresting, on account of being largely technical. The present-day



Mr. Fred Dover.

machine and rider can do anything in the way of running to time and climbing hills, and, in my opinion, the popularity of the old events was due to the sporting element. What the machine of the future will be depends upon the requirements of the rider.

For dodging about town on pleasure or business without luggage, it seems to me a 2½ h.p. two-stroke two-speed countershaft model fills the bill. For solo distance riding with a small amount of luggage and a sidecar attached occasionally, a 3½ h.p. single three-speed countershaft chain-cum-belt is my fancy. For touring with passenger and luggage for two, I want a 7 h.p. three-speed countershaft, 28in. wheels, 3in. tyres, all-chain jigger; spring frames on all models. I should vote for 28in. wheels on all models also; but, being of short stature myself, I think 26×2½in. for solo riding would be better.

Manufacturers, in their own interests, should do all they can to improve and perfect the "sundry" side of motor cycling, including perfect lighting arrangements, cheap fuel, and prompt attention to spares.

From Mr. Harold Weldon, Hon. Secretary, Nottingham and District M.C.C.

HOWEVER keen we may be on British motor cycles, I think we must admit that in design our best makes are not progressing as they should. Compare any British car with the best motor cycle made, and it becomes evident at once what a long way behind is the motor cycle. Why should it be? We did not wait for the Americans to show us how to fit four-cylinder engines in our cars; why should we wait for them to show that they are desirable in motor cycles? Why did we let them get on the market with all-chain drives, what time we were still hanging on to belts? Not because American engineers are more clever than ours. No! Then it must be our manufacturers who are to blame.

If we in England can produce the finest cars in the world, why cannot we produce the finest motor cycles?

Is there any reason why we should not have four-cylinder, three-speed, spring-frame, detachable wheeled machines, with automatic carburetter and lubrication the same as we expect and get on any car? I plump for four cylinders, because it has been proved in the car world that the four makes a better all-round car than does a twin engine; it is a better wearing car, and no more trouble to keep in order.

The same thing will happen with motor cycles, and, although I believe in British goods for Britons, I submit that there is no sweeter running motor cycle made than the American Henderson. Our V twins will not bear comparison with it either for smooth running or for life of bearings—big-ends especially. A big, easy compression, long-stroke flat twin might run it close, but there isn't one. Our frames, with one or two exceptions, are the same as they were when I first started riding in 1908. Spring frames we must have. Rigid frames are no use to our cousins in the Colonies, and they would like to use British machines if possible.

We motor cyclists who ride to business every day are watching the cycle car movement closely, but cycle cars must be built on sturdy, simple lines like the Morgan. In 1913 I owned a G.W.K., which I ran for 18,000 miles, and the only times I had trouble with the friction drive was when I had to start away up hill. Now if this car had been half the weight (mine weighed 15 cwt. unladen) I do not think it would be stuck anywhere. I am now running a Morgan and an 8 h.p. Zenith, and have nothing but praise for both of them.

From Lt. Francis A. McNab, R.N.V.R., of Brooklands Fame.

MAY I, in view of the tendency of modern designers to increase both cost and complication (i.e., four-speed gears, spring frames, kick-starters, clutches, extra large and expensive tyres, etc.), make a plea for a sporting, simple, and moderate-priced type of machine? From personal experience I feel convinced that this constitutes the kind of machine that will appeal to a large section of service men on their return to civil life.



Lt. F. A. McNab, R.N.R.

The specifications of the type of motor bicycle I have in view would be somewhat on the following lines:

Engine, 500 c.c., single-cylinder, with decompressor. A simple, light countershaft two-speed gear box, with chain-cum-belt drive. No clutch or kick starter, the decompressor on a well-tuned engine eliminating the necessity for these. The gear change should be foot-operated, leaving both hands free for starting and control.

I am sure that this type of machine has many advantages, both from the manufacturers' and the riders' point of view. From the standpoint of the former, simplicity in construction means few complicated (and therefore expensive) parts to be made, resulting in a quick change-over and early delivery.

I also maintain that the fast and handy type, easy to keep in tip-top tune (and, incidentally, quite capable of taking a light sidecar on any ordinary road), is what the really sporting rider wants.

We are none of us likely to be blessed with too much £ s. d. for some time to come; therefore, its price should make this machine the choice of many.

May I, in conclusion, offer my congratulations on the splendid way *The Motor Cycle* has kept its high standard of interest throughout the war. I wish it the best of luck and a speedy return to the good old times of plenty of petrol.

From Sec.-Lt. B. Alan Hill, Competition Rider and Journalist.

IN my opinion, future motor cycles will eventually be divided into three distinct classes—i.e., the commercial, the luxury, and the sporting types. The manufacturer who wishes to capture all three classes of trade, and especially the first two named, will undoubtedly have much heavy spade work to accomplish. I expect the ultimate outcome will be that few will tackle the problems offered by all three classes, and each manufacturer will specialise in the particular class he favours, in the same way as is commonly done in the car trade at the present time.

As far as the sporting machine is concerned, I fancy the present type of motor cycle already caters pretty well for all tastes from a sporting point of

view alone, and it seems doubtful whether future designs could possibly improve to any great extent on present types. In pre-war days this type of rider was undoubtedly in the majority, this probably being due chiefly to the facts that the trade did not cater sufficiently for the business man or the man who desired comfortable and luxurious travel, also the fact that the public had not learned the hard lesson of war, i.e., economy.

Before economy became a consideration to all, the business and trades men resorted naturally to the cheap and efficient Ford, while the man who required a machine for comfortable travel usually sported the comfortable high or medium-priced car. Now is the time, while economy is still a necessity, for the motor cycle industry to strike a decisive blow and prove that a motor cycle can be produced that can not only compete with cars on their own ground, but beat them on the score of economy and low original cost.



Sec.-Lt. B. Alan Hill.

Opinions.—

Undoubtedly the type which has so far received the least attention, and upon which the trade should concentrate, is the commercial machine, for which there is, even now, a big demand, although the available types are only makeshifts, while if a proper commercial machine be produced, the demand, I am sure, will be enormous. I suggest that the following features should be the chief aim of the manufacturer.

Simplicity of construction; accessibility of all parts; suitability for either solo or sidecar use; adequate protection from mud and damp for all moving parts; foolproof and simple control, and simplicity of adjustment; automatic or mechanical means for lubrication of all parts; protection for the rider from mud and dirt; quantity production; standardisation of all parts; and, above all, production at a price which will absolutely defy competition by the cheap cars which have monopolised the market up to now for this class of work. This type of machine should appeal to the tradesman for goods delivery.

From Mr. R. J. Mecredy, Editor of "The Motor News."

ALTHOUGH I have possessed many motor cycles, the only one that appealed to me was a 1900 1½ h.p. Phoenix.

It was built on the lines of the pedal cycle, and the little engine was secured in the angle of the frame between the diagonal and the tube running between the bottom bracket and the head. The drive was by belt, and the usual cranks and pedals were fitted, and I had a three-speed pedalling gear installed in the back hub, with a high speed of 100in. I have been an ardent pedal cyclist since the year 1879, and always thoroughly en-



Mr. R. J. Mecredy.

joyed the mere act of self-propulsion, for I am one of those energetic people whose happiness depends, mostly, on energetic exertion, though I must admit that the climbing of steep mountain passes, either pedalling or pushing my bicycle, often proved irksome.

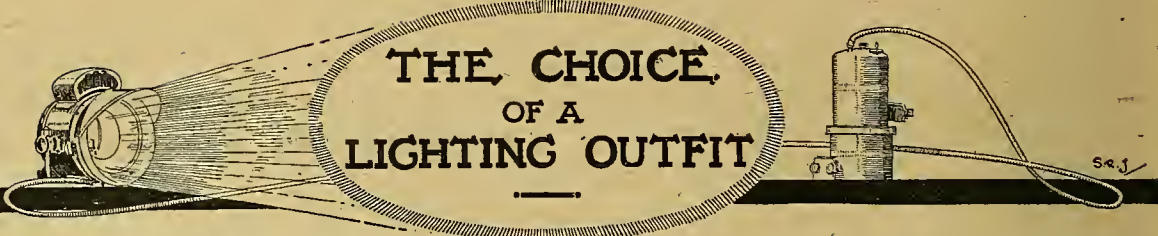
The Phoenix solved the problem. The starting of the engine on low or second speed was easy and rapid. Once under way I switched in the 100in. pedalling gear and moderated my pedalling just short of the point when perspiration becomes unpleasant; and when I hankered after a free-wheel downhill or on the level, I could, if so disposed, cease pedalling and leave to the engine any work there was to do. Much of my riding was done amongst the Wicklow mountains, and never once did I get stalled. Quite moderate pedalling kept the little engine revving at its most efficient speed, and I never knew it overheat.

As a matter of fact, this natty little combination embodied, from my point of view, the best features of both the push bicycle and the motor bicycle.

THE BUYERS' GUIDE.

Current Prices and Delivery Dates for 1919 Motor Cycles.

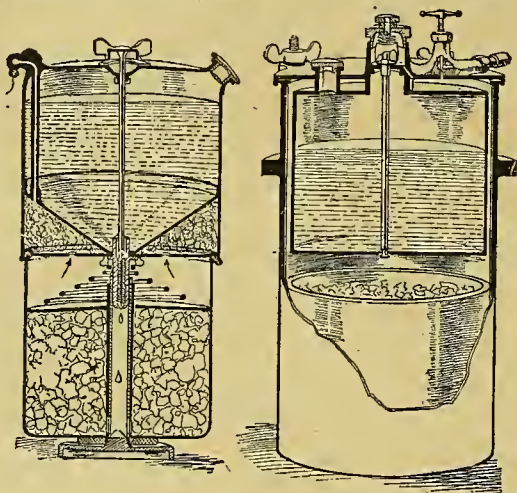
Make.	H.P.	Particulars in Brief.	Price.	Delivery.	Make.	H.P.	Particulars in Brief.	Price.	Delivery.
A.B.C.	5	Spring frame.	£ 70 0 0	May. (Price approx.)	LEVIS	2½	2-stroke, single gear	£ 33 0 0	January. Output booked until end of March.
A.J.S.	6	Twin, 3-speed.	106 1 0	End of January.	L.M.C.	3½	3-sp. countershaft gear.	73 0 0	Delivery at end of January.
A.J.S.	6	Sidecar combination.	142 16 0	January.	L.M.C.	4½	Ditto.	75 0 0	
ALION	2½	2-stroke, 2-speed, clutch.	55 0 0	January.	L.M.C.	6	Twin ditto.	86 10 0	
ARIEL	2½	2-stroke, 2-speed, clutch, and kick-starter.	65 0 0	January.	MATCHLESS	5	Combination.	140 0 0	January.
ARIEL	3½	3-speed.	80 0 0		METRO-TYLER	2½	2-stroke, 2-speed.	45 0 0	End of January
ARIEL	3½	Sidecar combination	106 0 0		MORGAN	8	M.A.G. engine.	132 12 0	Delivery commenced. Engine output for 1919 booked by various agents.
BLACKBURN	2½	4-stroke, 2-speed, clutch	60 0 0		MORGAN	8	G.P., J.A.P. engine.	143 17 0	
BLACKBURN	4	3-speed.	82 0 0		MORGAN	8	De luxe, M.A.G. (w.c., J.A.P., £8 ss. extra).	143 17 0	
BLACKBURN	8	Combination.	125 0 0		NEW IMPERIAL	2½	J.A.P. engine, 2-speed.	50 8 0	Delivery commenced
BRADBURY	2½	4-stroke, 350 c.c., 2-sp.	63 0 0		NEW IMPERIAL	2½	J.A.P. engine, 2-speed, clutch.	58 16 0	
BRAOBURY	4	Single, 3-speed, chain.	82 0 0		NORTON	3½	Combination.	126 0 0	Delivery shortly
BRAOBURY	4	Twin, 3-speed chain.	82 0 0		NORTON	3½	All-chain drive.	87 0 0	
BRITISH EXCELSIOR	2½	2-stroke, 3-speed countershaft, and kick-starter.	100 0 0		NORTON	3½	T.T. countershaft, all-chain.	45 0 0	
BRITISH EXCELSIOR	2½	2-stroke, 2-speed.	62 0 0	April.	NORTON	3½	Single gear, B.R.S. engine.	73 0 0	Delivery commenced
			56 0 0	March.	NORTON	3½	Ditto, with B.S. engine.	80 0 0	
				Delivery commenced.	NORTON	3½	Standard, T.T., all belt.	63 0 0	
B.S.A.	4½	All-chain drive.	81 15 0	Orders carried out a rotation as far as possible.	P. & M.	3½	R.A.F. model.	78 0 0	A limited number during Jan
B.S.A.	4½	Chain-cum-belt.	79 16 0		P. & M.	3½	Combination.	102 0 0	
B.S.A.	—	Sidecar	29 9 0		RAOCCO	2½	2-stroke, single gear	42 0 0	Early in February (approx.)
CALTHORPE	2½	J.A.P. engine, 2-speed.	52 0 0	Delivery commenced.	ROYAL RUBY	6 or 8	Twin 3-speed.	105 0 0	
CALTHORPE	2½	2-stroke, 2-speed.	50 0 0		ROYAL RUBY	2½	2-stroke single gear.	41 0 0	Three or four weeks.
COVENTRY EAGLE	2½	2-stroke.	47 5 0		SPARKBROOK	2½	2-stroke, single-speed.	45 4 0	
COVENTRY EAGLE	2½	Ditto, 2-speed.	54 12 0		SPARKBROOK	2½	2-stroke, 2-speed.	52 10 0	Provisional prices only.
COVENTRY EAGLE	2½	J.A.P.	47 5 0		SUNBEAM	3½	3-speed, all-chain.	94 10 0	
COVENTRY EAGLE	2½	Ditto, 2-speed.	54 12 0		SUNBEAM	4	3-speed, all-chain.	120 15 0	April
COVENTRY EAGLE	3½	S.A. c/saft, 3-speed.	82 19 0		SUN-VITESSE	2½	2-stroke, single-speed.	40 0 0	
DOT	8	Combination.	135 0 0	Delivery end of February.	SUN-VITESSE	2½	2-stroke, 2-speed.	52 0 0	April
DOT	3	Twin, 2-speed.	65 0 0		TRIUMPH	4	W.D. Model.	87 0 0	
DOT	2½	Twin, 2-speed.	55 0 0		TRIUMPH	2½	2-stroke, 2-speed.	54 0 0	Deliveries to agents commenced.
DOUGLAS	2½	W.D. Model.	60 0 0	Delivery commenced.	VELOCETTE	2½	2-stroke, 2-speed.	40 0 0	
DOUGLAS	4	W.D. Model.	75 0 0		VELOCETTE	2½	2-str., 2-sp., ladies mod.	42 0 0	Delivery in a few weeks.
DOUGLAS	4	Combination.	95 0 0		WOOLER	2½	2-stroke, variable gear.	61 19 0	
ENFIELD	2½	2-stroke, 2-speed chain-drive.	52 10 0	It is hoped to commence delivery in January	WOOLER	2½	Flat twin, 4-stroke.	61 19 0	April.
ENFIELD	3	4-stroke, twin, 2-speed.	69 6 0						
ENFIELD	6	Combination.	115 10 0						
ENFIELD	8	Combination.	117 12 0						
G.N. CYCLE CAR	19	2-cyl. Standard model.	140 0 0	Early in April					
G.N. CYCLE CAR	10	2-cyl. Vitesse model.	170 0 0						
HUMBER	3½	Flat twin, 3-speed.	85 0 0	Shortly					
JAMES	4½	No. 6, single, 3-speed.	89 5 0						
JAMES	4½	No. 6, with sidecar.	115 15 0						
JAMES	3½	No. 7, V twin, 3-speed.	89 5 0	Delivery commenced.					
JAMES	2½	No. 8, 2-stroke, 2-speed.	54 12 0						
JAMES	5-6	No. 9, twin, 3-speed.	99 15 0						
JAMES	5-6	Combination.	126 0 0						



THE CHOICE OF A LIGHTING OUTFIT

A Survey of the Various Types and the Principles on which they Work.

THE "Which Type" referendum brings up the question of lighting sets for the motor cycle, both solo and sidecar outfits. Now this is one of the details which concern the whole of the motor cycling fraternity very closely. Yet many do not know the elementary principles and construction of the type



(Left) Sectional view of an ordinary type of generator.
(Right) The Low generator in section.

they advocate. In the following notes a survey of the various types of lighting sets is given which may be helpful.

Gas Systems.

Perhaps the lighting apparatus most familiar to the motor cyclist is the acetylene lamp with the separate gas generator. Of this lamp there are many types, but the principle remains the same in each. The simplest generator, one familiar to all who have used acetylene lamps, is constructed generally as shown in the first sketch. The drawing is practically self-explanatory. The apparatus consists of a container for carbide and a water reservoir, the water supply being controlled by valve operated from above as shown. The carbide is kept in a compact mass, by a spring-loaded plate. The gas is generated by the chemical action of the water on the carbide, and passes through holes in this plate, and through holes in the "floor" of a superimposed chamber filled with asbestos wool, or similar substance. There it is cooled and filtered to remove any solid matter or steam likely to be in suspension. From the chamber it goes to the outlet *via* a brass tube passing through the water container, and so to the lamp.

Various modifications of and improvements on this simple type have been adopted by makers at different

times, such as shaking grids in which the carbide is held in a wire basket. In this device the vibration of the machine shakes the used and powdered carbide into the well of the vessel, leaving the rest unclogged.

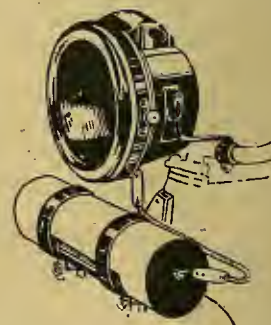
Another type of generator is the "Low," which is illustrated diagrammatically. The body is made of steel lined with a porous substance, such as plaster of Paris. The carbide is placed in a container in the bottom of the body, and the water reservoir is attached to the cover. The generator is operated by unscrewing the upper milled nut which opens the water valve. The gas generated gradually raises the internal pressure and may be released for use by opening the needle valve on the outlet pipe. If this is not done the pressure gradually rises to about 30 lb. per square inch. At this point the pressure, acting through the small orifice leading to the chamber in the lid, operates the small rubber valve which closes the water supply valve, thus stopping any further generation of gas. The object of the porous lining is to absorb some of the gas under pressure, which it releases when the pressure drops. Great economy is possible by the use of this type of generator.

A very clean and handy method of utilising acetylene gas is to compress it in cylinders, so that all the rider has to do is to connect up a fresh cylinder bought ready charged, as each becomes empty, and there is no waste of time and no messy handling of carbide, etc. As there is undoubtedly danger in the carrying of this gas under pressure, various methods have been tried of rendering it safe, and the most successful so far is that known as "dissolved acetylene." The gas is pumped into cylinders, which hold about five cubic feet, and the lamps are fed through a pressure-reducing valve. This system, though perhaps expensive in first cost, is admirable from every point of view, the only difficulties being those of distribution, which, of course, are not insurmountable.

The "service" in connection with its distribution and the changing of cylinders is properly organised. The cylinders

must be as easily obtainable as petrol used to be—at every repair shop and every other ironmongers.

This practically covers the field as regards gas lighting, which has many good points and many objectionable ones. Carbide is not the most pleasant stuff



A compact dissolved acetylene set, the cylinder being carried on a bracket fixed to the steering head.

The Choice of a Lighting Outfit.—

to handle, particularly in conjunction with water, and with the motor cycle lighting set this has frequently to be done at the most awkward times in the dark and the rain!

Electric Systems.

Electric lighting has made great strides during the past few years, both as regards reliability and portability. Where dynamo-lighting outfits have been used for the motor cycle they have generally been confined to the big sidecar outfits, and altogether too cumbersome and unsuitable for solo use. Now, however, the outlook is more favourable and solo outfits should soon become a standard. Besides the dynamo, of course, there are many other systems, such as the flywheel magneto lighting, accumulators, dry batteries, and the American dynamo lighting sets.

An example of the fly-wheel magneto type was illustrated in *The Motor Cycle* of July 18th, 1918, with a description of the Johnson motor wheel. This is naturally a very simple type, yet it must, of necessity, be designed and built with the engine.

Accumulators are suitable for either solo or sidecar machines, but for the former the difficulty is storage, which must be neat and substantial to protect the accumulator from possible damage, either by direct injury or vibration, etc. Accumulators are useful where there are facilities for recharging, but they require a certain amount of care in use and may be easily damaged in the hands of a novice.

For those who do not understand the action of the accumulator it may be stated briefly as follows:

An accumulator is a secondary battery, that is, its power of giving out a current is the result of having had a current forced through it from some primary source of supply. The chief advantage in a secondary

battery is that it can be discharged and recharged time after time. The action of nearly all accumulators depends on the fact that if two plates—one of lead and one of lead peroxide—are immersed in sulphuric acid, and an external circuit completed between them, a current will flow through

the acid to the peroxide plate, and thence through the external circuit back to the lead plate. In practice each cell may contain one peroxide or "positive" plate sandwiched between two lead or "negative" plates. Each cell gives out about two volts, so that the usual double cell has a 4-volt current, which is quite good for motor cycle lighting work. A convenient size for solo work would be a 20 ampère hour with two lamps, and for sidecar with three lamps a 40 ampère hour.

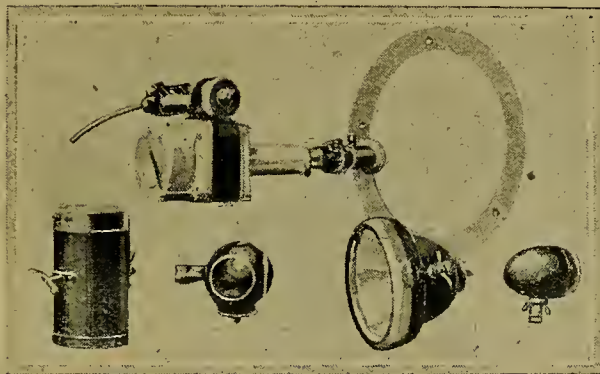
The accumulator may be perfect in design and construction, but it is always subject to diminution in capacity by neglect on the part of the user. The fact that attention only is demanded at rare intervals is one of the reasons why electric systems are liable to be neglected. As regards the lamps, a 12 c.p. bulb is ample for the head light, and 2 c.p. for the tail and sidecar lamps.

A good dry battery finds favour with many solo riders on account of its cleanliness and handiness, and an ordinary 4-volt battery should give a good light for about seventy hours, or on an average six months' use. A separate

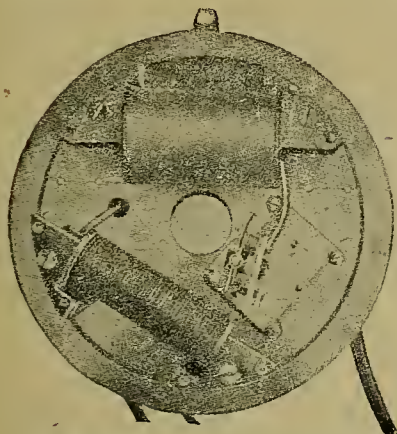
battery is advisable for each lamp.

The combined dynamo magneto is used on a number of American machines. This system comprises a dynamo and coil which are fitted in place of the usual magneto. The coil converts the low-tension current to high-tension for the ignition, the low-tension direct current charges the storage battery, operates the horn, and lights the lamps. Since the British magneto industry has grown so enormously during the war, it is not likely that this type will be adopted as a standard by many makers in this country.

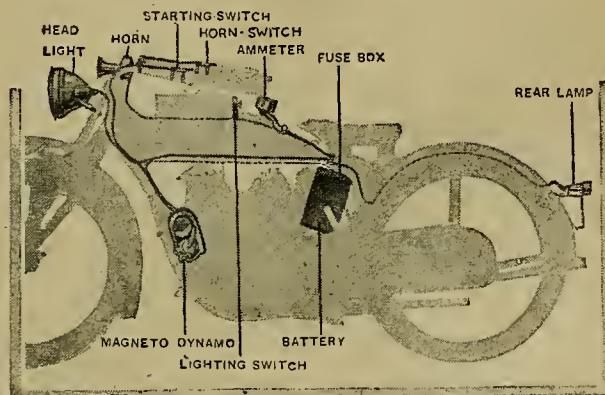
Another method of obtaining electric light sufficient for two lamps is the F.R.S. system, using the standard magneto to produce the current. With this system it is necessary to carry an accumulator for use when the machine is stationary.



Parts of the F.R.S. dynamo set. -The ring at the right is attached to the rear wheel and forms the driving disc.



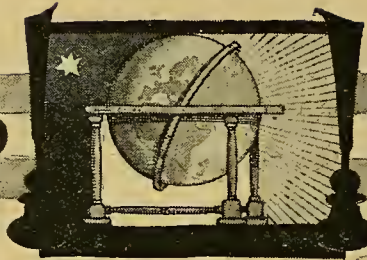
The fly-wheel type of generator, which also provides the current for ignition purposes.



The disposition and wiring of a dynamo-magneto lighting plant on a solo machine

LETTERS TO

THE EDITOR



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

SUITABLE GEAR RATIOS.

Sir,—With reference to the article, "Gear Ratios on a Solo Machine," on page 81 of your issue of Thursday, January 16th, might we point out that the Rudge Multi infinitely variable gear gives $3\frac{1}{2}$ to 1 on top (which, apparently, is higher than any gear obtained with the gear boxes mentioned in your article), combined with a low gear of $6\frac{1}{4}$ to 1, which also appears to be what your contributor desires for solo riding? No doubt it was this happy combination which enabled Mr. C. G. Pullin to win the last T.T. Race ridden in the Isle of Man in 1914.

RUDGE-WHITWORTH, LTD.

CONES WORKING LOOSE.

Sir,—I notice in your issue of January 2nd one of your correspondents complains of his cones working loose. I presume, after carefully reading his letter, that his hubs are disc-adjusting, as used on our P. and M. machines. In these the cone is not adjustable, but the cup, which screws into the hub shell and the adjusting side, is fixed by a locking ring or nut. What usually causes this to come undone is the wheel being put in the wrong way about. If the adjusting side is left-hand thread, the wheel should be put in with adjusting side on the left side of the machine, and, if right hand, to the right side of the machine. Trusting this will be of some use,

W.E.T. (R.A.F., D.R.).

DIRECT BELT DRIVE.

Sir,—May I express my appreciation of *The Motor Cycle*, and especially of the exceedingly interesting and most helpful "Occasional Comments" of "Ixion"? It is good to see *The Motor Cycle* of last week, which is so much more like that of old days, both in bulk and general character.

It may interest you to know that I am a schoolmaster, and find my motor cycle of great use in my work, or, rather, in getting to and from my work.

I wish I could see more said in favour of direct belt drive. I still maintain that it is an ideal drive on a big twin, and most economical. There is no need to suffer from belt slip, even in a deluge of rain. Again and again I have come 150 miles through continuous rain on an 8 b.p. Matchless without the slightest trouble from belt. Please say a word or two in its favour occasionally, or ask "Ixion" to do so.

E. B. HALL.

ROAD REPAIRS.

Sir,—I am an old-time reader of *The Motor Cycle*, and I should like to voice my opinion on the article, "The Problem of the Roads."

The writer states: "In France there is a huge organisation of labour battalions under our most famous road experts, who have been doing little else than repairing the highways of France for the use of our victorious armies. It would therefore not be difficult to bring this organisation over here." Well, that sounds all right on paper, but is the writer aware of what sort of men compose these different battalions? Is he aware of the fact that there are a good percentage of "1914 Mons men" among them, who have been taken out of the firing line during the last few months of war owing to their being "military war-worn and to debility"? I for one, and many others of my company, have been out here since August, 1914, with unbroken Active Service, and, having done our share of the struggle, it is up to the authorities to release us. We have been treated quite badly enough without having the agony piled on, and we have no desire to soldier on. If there is any shortage of labour at home for road repairing, why not

engage the "Conchies" or prisoners of war, and, if need be, some of those fellows who evaded military service in different Government offices? I am sure they would be better suited for the job than some of us. Remember that the majority of the motoring men are still out here, and when we read such articles as I have referred to it makes one's blood boil.

(LATE) CORPORAL R.F.A.

B.E.F.

PETROL FEED PIPES.

Sir,—As an amateur motor cyclist, may I trespass on your space to ask a question which has puzzled me?

Why are the majority of carburetters fed by a pipe coming to the bottom of the float chamber, and not the top? I have used both. With the ordinary pattern I had trouble due to dirt in the pipe and round the needle; and a bent petrol pipe is not easy to clean at the best of times.

Now, the other day I thought my other carburetter (a B.S.A.) might need cleaning. Imagine my surprise when I found a hard, thick layer of dirt in the float chamber, which amounted to half an eggcupful, enough to block a pipe a dozen times. I never had noticed any trouble before cleaning, and there was no improvement afterwards, but I venture to suggest I should have been stopped a dozen times with my old machine.

Now, sir, surely there must be some advantage in the more usual type, but it is not simplicity, for all mechanism to depress the needle is done away with, and as the float rises it carries the needle with it.

Why, therefore, I ask, are the majority of carburetters fed from below, when the overhead form seems so much more simple and far less likely to cause trouble?

N. H. KETTLEWELL.

THE COMMUNAL GARAGE.

Sir,—I was interested in your article in January 2nd issue on the garage problem. It is a problem, and one that can only be overcome satisfactorily by motor cyclists clubbing together and building their own sheds. I have often wondered why blocks of lock-up sheds have not been built in new districts. Before the war a friend of mine put up two houses, which cost, with land, £600. His revenue from his capital outlay was £50 gross. I tried to persuade him at the time to use the land for a block of lock-up garages, for which he obtained a builders' estimate, which would have brought up the capital outlay to the same amount, £600 for forty sheds, which, rented at one shilling per week each, would have brought in a revenue of twice the amount he received from the houses.

The reason he did not decide to build the garages was his lack of faith in sufficient motorists in the district to rent the sheds. Probably he was right in his particular district, but there are many localities where it would pay the builder to put up a block of garages and bring in a handsome return on the outlay, and at the same time afford very cheap motor accommodation.

I think it is possible for such blocks of garages to be built so that they could be rented at about one shilling per week for a shed large enough to accommodate a sidecar. If two solo riders joined company their garage problem would be solved at a cost of sixpence each per week.

It seems absurdly low, of course, but let anyone look at a house and garden, renting at, say, ten shillings per week; let him calculate how many motor cycles could be stored on the same area—surely it would find floor space for more than ten machines. And surely the building to accommodate them would not cost the same as the five or six-roomed house?

CO-OPERATIVE.

PRICES.

Sir,—I made enquiries a few days ago for a motor cycle chain of a certain make. The enquiry was made at four different houses, and I received four different prices, viz., 8s., 5s., 4s. 6d., and 4s. per foot. This is not encouraging to the motor cyclist, and the above speaks for itself. Cannot the manufacturers in the interest of motorists fix prices reasonably, and advertise them?

Ilford.

NOT CAUGHT.

Sir,—In your table of the different makes and their programmes, I notice that you have put down the price of our machines as £70, definite. On reference to our letter to you of January 3rd, it would appear that we have not made it sufficiently clear that this price of £70 is purely provisional. We have only said we are hoping to market the machine at £70, but it may be more. We hope to be making a definite announcement within the next three weeks. We are most anxious not to mislead our market, and when we are unable to state a thing definitely we would much rather leave it clearly an open question.

THE SOPWITH AVIATION CO., LTD.

ALAN R. FENN.

Sir,—I note in your issue of last week the letter of "H.L.I.," in which he refers to my answer to "Disgusted," which, he states, explains nothing. May I again trespass on your valuable space to inform "H.L.I." that I did not attempt to explain altogether the rise in prices? That I leave to the manufacturer. What I did do was to protest against the attitude of "Disgusted," who singled out one particular make because its sponsors had the courage to publish their price, which, at the most, is only temporary, and subject to a decline when the cost of raw material permits it.

I pointed out to "Disgusted" that the firm to which he referred had not advanced this particular model any more than those of other first-class makes; and I am now indebted to the Editor of this popular journal for his publication last week of "The Buyers' Guide," which alone confirms my remarks in my answer to "Disgusted."

The firm referred to is one of the most conscientious in the trade; in fact, I consider that the British manufacturers are a conscientious body of men, who command the goodwill of the world, particularly in the motor trade, and as an American citizen I have no hesitation in stating that if the British motor cycle trade were permitted to have a footing in the American market they would be second to none, and capable of holding their own, for I consider the British machine the best, and second to none in point of workmanship, reliability, and practical engineering.

Another point I raise for "H.L.I." to consider is the present second-hand prices. I have taken a few from last week's issue of advertisements of leading agents as follows: 1916 8 h.p. Sunbeam, £160; 1916 Enfield, 6 h.p., £105; 1916 A.J.S., 6 h.p., £100; 1917 Harley-Davidson, £120; a 1916 Triumph solo, £80; and a Douglas solo, £70. This selection of second-hand mounts, I contend, speaks for itself when a comparison is drawn in the price of brand new models, up to date and embodying improvements which enhance their value, comfort, and convenience on the road, such as are now being produced.

"H.L.I." claims to have had a review of stocks of new motor cycles held by the leading agents. So have I, and in my opinion these stocks are hypothetical and on paper only; but I cannot agree with him as to the price being fixed since December 5th, 1918. He must bear in mind that, apart from raw materials, there is yet considerable difficulty in obtaining tyres, chains, balls, and other necessary things, which are still advancing in price, and which manufacturers cannot control. This alone justifies the increases to which "H.L.I." refers between the dates mentioned.

JEFFERSON J. MOORE.

LEAKAGE OF MAGNETISM.

Sir,—Re the loss of magnetism in Dixie magnetos. I see Mr. Chapman advises fitting either a brass sprocket or, better still, a steel sprocket with a brass centre. I own a 1916 B.S.A. with Dixie magneto; and not liking the idea of a brass sprocket, I had my steel sprocket bored out and a brass centre driven in. The result was exactly as before. Immediately the sprocket was placed on the armature, the periphery of the cog was as powerfully magnetised as before.

Even now that I have fitted a solid phosphor bronze cog, there is enough magnetism round the teeth to hold a pin. I am seriously considering fitting another make of magneto, as starting is extremely difficult, and the only plug that I can get to stand up to the work without missing when hill climbing is a Lodge racer.

Handsworth.

N.P.D.

Sir,—In an endeavour to help brother motor cyclists, I should like to place on record my experience of the Dixie magneto fitted to my O.K. Junior motor cycle.

As in the case of your previous correspondents, I had troubles traceable to poor ignition, and finally dismantled the magneto. I found the permanent magnets were in a very poor state, and had them remagnetised, which removed the trouble. Whilst dismounted, it was noticed that the steel of the magnets was so soft as to be very easily marked by drawing a file across them. I am open to correction, but I have always understood that permanent magnets to remain permanent should be of dead hard steel, and it is to this fact, in addition to the steel driving sprocket, that I attribute the loss of magnetism.

It should be noted in reassembling that the magnets must be in intimate contact with the steel bearing plates of the rotor pole pieces, and that they in turn should revolve as close as possible to the sides, as the slightest increase of air gap at these points has considerable effect upon the current.

Another trouble is the rapid pitting of the points, the cause of which I have not yet been able to ascertain.

F.C.C., Capt. R.A.

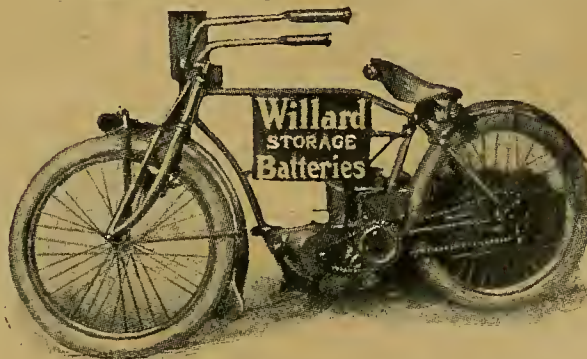
BENZOLE.

Sir,—A question of vital importance to motorists of all classes is at present being decided by a new association, known as the National Benzole Association. I believe this body is mainly composed of manufacturers of benzole products. I have reason to believe that a circular letter has been sent to all producers of benzole, giving a suggested specification for motor benzole. As one who for some considerable time has been manufacturing motor spirit, I can truthfully say that benzole fulfilling this suggested specification will not appeal to motorists after a few trial runs; and the only persons who are going to benefit to any extent are the producers of the spirit. On the face of the letter, I do not think that any motor engineer or chemist has been consulted. Furthermore, the price of the spirit is 3s. per gallon, which, again, is detrimental to the country, considering the tremendous amount of benzole which is now being produced.

I suggest, then, that the Benzole Association should call to a meeting the chemists who manufacture the product and one or two good motor engineers and hear their views on the subject, and I am quite certain that the result will be a product which will—if not quite equal to petrol—at least give satisfaction and be worthy of the good name benzole producers received during the war.

MOTORIST AND CHEMIST.

[This letter was submitted to the National Benzole Association, who state that the quality of the benzole has been decided by experts, and is, of course, subject to revision from time to time.—ED.]



An electric bicycle used with a delivery sidecar by the Willard Storage Battery Service in Pendleton, Ore., U.S.A. An old motor cycle, sans engine, and a "starter" from an automobile, with a storage battery, form this interesting combination.

TANGENTS OF OBSERVATION.

Sir,—There have been several letters on this subject, but I have not noticed that the correct answer has been published.

Excluding refraction, the distance (D) which can be seen in miles from a height (H) feet is $\frac{2R}{5,280} h = D^2$.

(2R is the diameter of the sphere and 5,280 is the number of feet in a mile.) This is geometrically true when h is small compared with 2R. As the diameter of the earth is roughly 8,000 miles, this formula reduces to $h = \frac{2}{3} D^2$ almost exactly.

The effect of refraction near the surface of the earth is generally taken as $\frac{2}{21} D^2$, so that the formula becomes

$h = \frac{4}{7} D^2$, or $D = 1.32 \sqrt{h}$, or about 8% less than the figure given by Gunner Harle on January 16th.

In the winter of 1893 with the naked eye I saw Mount Etna in Sicily (height, 10,865 feet) from Valetta in Malta—a distance of 125 miles.

The weather is seldom clear enough to see this distance, but the sight is certainly possible. The refraction of astronomical objects at the horizon is about half a degree, but then the whole atmosphere is looked through. The method of combining the heights given by Gunner Harle is correct. The heights must not be added, but two sums must be done. London. J.H.H. (MAJ.).

THE THREE-JET BINKS CARBURETTER.

Sir,—Referring to Capt. Lindsay's further letter as to the supposed dead spot in my carburetters, I would like to state again, and most emphatically, that if there is no fault in the construction of the carburetter this dead spot does not occur.

I only wish that I could get my esteemed client, Capt. Lindsay, over to our works with a machine in which he says he experiences a dead spot, and I would stake my reputation that I could put this right in a few minutes. I would also like to point out that, although Capt. Lindsay has done me the honour of using my carburetters on no fewer than thirty-seven machines, he has never even drawn my attention to it in a letter. The matter must be only trivial, otherwise so experienced a motor cyclist would never have used my carburetters so consistently; but to arrive at something final on this matter, I would suggest that it be definitely ascertained and stated by an independent party, such as yourself, whether a dead spot is there or not. I suggest that I attend at your editorial offices with a machine fitted with my ordinary three-jet carburetter, and that it be then and there tested by you, or someone you may appoint. If the dead spot is there—well it is there, and there is an end of it; but if it is not, it must prove what I say—that no dead spot is or should be there. The result of this test to be considered final, and published in your paper. C. BINKS.

[We shall be pleased to undertake the suggested test and to report upon it, but we would point out that the only thing it will prove will be the absence of a dead spot in the particular carburetter with which the test is made.—Ed.]

WAR-TIME MOUNTS.

Sir,—Since July, 1914, I have owned the following: Quadrant, Triumph, Warne cycle car, 1914 6 h.p. Royal Enfield, Douglas, 1915 6 h.p. Enfield, and, again, a 2½ h.p. Douglas (my present mount).

I have been a rider continuously since 1903, and on looking back over four years of war one wonders how we have kept on the road at all. My official duties have given me many rough journeys, and, like many others, I have had to do most of my own repairs. Coming home to Brighton on a very dark and rainy night, with both bottom fork links broken, carbon brush broken, and a belt link lin. instead of ¾ in., is no joke on a Douglas, I can assure you, although I had a stout strap to hold the front forks to the rest of the machine. On the pot-holey roads from Lewes to Brighton I did not average twenty miles per hour, and, furthermore, I did not try.

My Quadrant, which had a hub gear, I sold, and subsequently obtained a Warne cycle car, as I wanted protection from the elements. May I be forgiven for deserting a motor

cycle. I have distinct recollections of overheating, breaking valves, and tremendous petrol consumption whenever I tried to keep the 'bus covering thirty miles in the hour. This was a useless proposition to me, because the whole thing wanted thoroughly overhauling, and in war-time no one could be found to do the job.

To carry on, I bought a single-speed 1910 Triumph, and as I prided myself on always having an up-to-date "iron," this was nearly the limit. We went together for many, many miles all over Sussex, but did I not have to pedal up some of the hills? I called on some friends one day, and left it against a tree. When I came out of the farm I could not get it to fire, although I tried for one and a half hours. I was stranded seven miles from the nearest station, so the Triumph was left there until the Sunday, when we were both ignominiously towed home by another Triumph. The joke of the whole thing is that immediately I got home, and, without doing anything except putting on the belt again, the old 'bus fired, and was never any further trouble.

Many little things, such as using small wire nails for chain rivets, Chinese lanterns when carbide gave out and none could be bought, getting paraffin from country cottages before the engine cooled, going without a decent meal for seven and eight hours at a stretch because country places gave up making meals owing to the rationing scheme, were all in the day's run, and helped one to realise what the "boys" over there are going through.

For some time I had the loan of a 1915 3½ h.p. Sunbeam combination, and never was a sweeter 3½ h.p. made. My wife and I went from Brighton to Manchester, and took five days to get back: held up in Birmingham for two days, dug out of 15ft. snowdrifts in the Vale of Evesham, wet through (and, owing to snow penetrating the 'bag, no change of clothes) at Oxford, but nothing except kindness shown everywhere. Never a misfire from the engine all the way; and when I say I had to take off the footboards and front mudguard, frictioned a back tyre through, and knocked off the silencer, it will be noticed it was "some" ride. In 1916 I did the run from Brighton to Manchester in one day on a 6 h.p. Enfield which had been hammered for over two years, and except for a puncture I had no trouble whatever, and got to a theatre in the evening.

My many changes of machines have been necessary because big repairs could not be done under a long period, although I could get a Class A priority certificate. I could only sell out and buy another machine. I found that to pay a good price for a reliable second-hand machine was the only way out, and I think this is a method that will pay others in the near future. I practise what I preach when I state that a fortnight ago I gave £45 for my present 1914 2½ h.p. Douglas, but its condition is practically perfect.

I have fifteen years' experience of motor cycling, but, like many others, I will give it up and take to a bath chair with auto-wheel attached before I will give £150 for a motor cycle and sidecar which to-day, as in 1905, covers me with mud and road filth, and requires six hours' solid work to clean it after 150 miles round Sussex on a bad day. We are a cheery lot, but there are limits even to our expenditure for our pet hobby. WM. WILSON.

SUMMARY OF CORRESPONDENCE.

A reader, Mr. R. W. Lewis, Beverston, St. James's Square, Cheltenham, would be glad to hear from any other reader who is suffering from a similar misfortune to himself, namely, the amputation of the right arm at the shoulder, who could tell him how best to control a sidecar combination, and also which type would be most suitable for his needs.

BOOKS FOR MOTOR CYCLISTS

HINTS AND TIPS FOR MOTOR CYCLISTS.

A valuable collection of useful "wrinkles" and items of information concerning the running, management, and repair of motor cycles.

Price 2/- net. By post, 2/3.

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THE BAILY CRANKLESS ENGINE.

A Revolutionary Idea in Power Transmission.

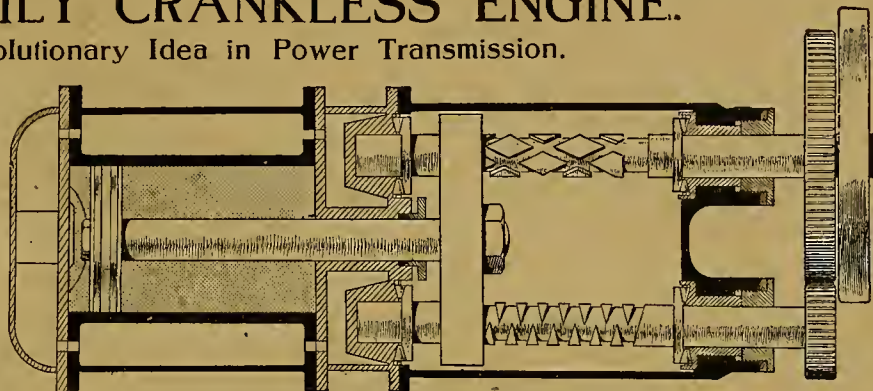
THIS unusual engine, which is the subject of the accompanying illustration, has been submitted to us as having been run successfully in Australia four years ago.

As will be seen, the main feature of the design is the elimination of the crankshaft, the cylinder being in axial alignment with the main shaft.

This method of construction is not new, however, as the utilisation of a helix to convert the reciprocating motion of the piston to a continuous revolving one was embodied in the "heli-crank" steam engine designed by Mr. C. Hyde Beadle in 1898, and later by Messrs. Moonbeams, Ltd., who applied the principle to a petrol engine. Unfortunately, nothing came of this latter, and the design was eventually dropped.

The Working Principle.

The Baily engine is of the double-acting four-stroke type, explosions taking place at both sides of the piston. The method of working will be obvious from the drawing. Each stroke of the piston rotates the main shaft one complete turn by the pressure of the "teeth" in the crosshead on the diamond-shaped portions of the helices. The flywheel is attached to the end of the shaft. The smaller shaft, which has a slower thread helix, serves to



The Baily crankless engine, showing how the reciprocating motion is transformed to a rotary one by means of a helically threaded shaft.

start the crosshead on the return motion at the end of each stroke. It is driven by gearing from the main shaft as shown. Both the shafts are on tapered roller bearings, which are adjustable from the outside.

On turning to the piston and cylinder construction, as shown in the drawing, several grave defects become apparent. Whether these have received attention in the actual engine or not we cannot say. It does not need any great effort of the imagination to picture the piston rod and head, after a short period of running, in a state approaching the incandescent,

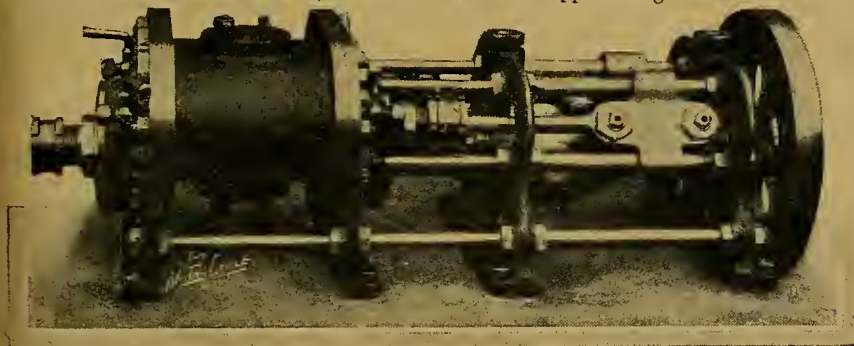
and the introduction of lubricant presents no small difficulty. According to the drawing, the bore and stroke are 86×102 mm., giving a total capacity of 1,120 c.c. after allowing for the piston rod in the one side. As the clearance shown amounts to only half an inch, the compression ratio is grossly exaggerated.

Points to be Overcome.

On going into details, further discrepancies disclose themselves, such as the rotating speeds. The guide rod is geared 8 to 1 from the main shaft, so that at the quoted speed of 3,000 r.p.m. (6,000 strokes), at which the engine is said to run smoothly, the guide rod is turning at the rate of not less than 48,000 r.p.m.! The valves are operated through cranked levers bearing on a camshaft, which runs the whole length of the engine, parallel to the mainshaft.

The overall dimensions are given as 10×22 in., and the engine is said to develop 16 h.p. at 1,000 r.p.m. A new engine has also been designed, weighing 40 lb., to develop 44 h.p. at 2,500 r.p.m.

Doubtless all the faults indicated are capable of being overcome, and we think the design deserving of more than passing notice, in view of the possibilities it seems to possess in the way of balance and compact construction.



The original helicrank steam engine on which the principle was first successfully adopted.

AMERICAN VIEWS OF BRITISH MACHINES.

WE are particularly interested in the views of American despatch riders, many of whom have been riding British-made motor cycles at the Front. The poet Burns aptly emphasises the importance of seeing "ourselves as others see us," but it has been part of our insular nature to consider that English motor cycles are pre-eminently supreme, and that nothing can be learnt from foreign manufacturers. That English motor cycles are supreme we know, but this does not mean that we cannot learn a good deal from the makers of other countries.

One correspondent writes to *Motor Cycling and Bicycling* of Chicago: "Talking about riding motor cycles, I might say that I am mounted on a British one-lunger, belt drive, and three speeds. I imagine it is good for forty-five all out, but who wants to ride—or

rather can ride—that fast on these delightful roads? It is a low-hung machine with 26 in. wheels, easy to handle, somewhat like a Cleveland—that is, the fork is the same, but it is driven with a V belt instead of chain. I never had a bit of trouble with it, and I have been putting the tiny thing through its paces for the past twelve months, so I can say this much for it: it is good, though small—the right kind of mount for this kind of work."

Another correspondent to the same journal declares his views on English machines in no uncertain terms. Needless to say, these are the opinions of the rider and not of this journal:

"During my time as a D.R. I have had six Douglas machines, an English make, two-speed, twin-cylinder, opposite motor, weighing about 125-150 lb., $2\frac{3}{4}$ h.p., no clutch, and belt drive. The

motor is very smooth running, but the carburettor, like the majority fitted on English machines, is a joke. I rode a —, the best single-cylinder machine I have ever seen. This was a three-speed mediumweight model, just right for the conditions over here. It is a machine of few parts, with belt drive. There are other makes of machines 'over here' in the war game, but I prefer the — to any as a solo machine. The sidecar outfits are numerous, and I have driven, of the English make, Clyno, Rudge, and Douglas. There are many objections to English machines, such as weak and awkward frames, low-powered motors, queer handle-bars, clumsy controls, no equipment, not a graceful or symmetrically built machine. Of course, they have good points. My objection to American-made machines for solo use over here is too high a saddle position.

QUESTIONS AND REPLIES

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C.4, and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

Overhauling a Zenith.

[?] I have been overhauling my machine, a Zenith-Gradua, and cannot get the back wheel out of the frame, nor the sliding plungers which carry it. Please let me know the best way to get it out.—T.T.

If the wheel is on a machine dating from 1912, the plungers carry the fork ends, and the wheel may be removed by loosening the two axle nuts; but if of 1911 date or earlier, the plungers themselves must be removed, as they are screwed on to the axles. Everything in the way of the wheel should be removed, such as mudguards, etc., and the two caps at the rear ends of the fork taken off, and then the gear should be completely unscrewed. This is rather a troublesome job, but it can be done by an amateur.

About the F.N.

[?] (1.) Could you tell me the year of a 4.5 h.p. four-cylinder F.N., frame No. 35,757 (no number on engine)? (2.) It has no clutch. Could you give me details of F.N. clutch, and, if one can be fitted, should I be able to obtain one? (3.) It has no speed gear. Could one be fitted, or could the bevel gear be screwed to a two or three-speed hub? (4.) Can I obtain jets for a *breveté* single lever carburetter, and how does one adjust it to run slowly? It will hardly fire below 10 m.p.h. (5.) Is there any special setting of the valves? The exhaust is set to close as the piston reaches the top of the stroke. What lift should the a.o.i.v. have? (6.) And, lastly, what is the maker's name, and what do the letters F.N. mean?—F.H.

(1.) You will have to send this information to the agents, F.N. (England), Ltd., Efenmo Works, Kimberley Road, Willesden, London, N.W.10. (2.) The clutch is of the multi-disc type, and full information can be obtained from the firm. (3.) The firm could also possibly fit you up with a two-speed gear. A hub gear could not be fitted. (4.) The word *breveté* merely means patented. We presume the carburetter in question is an F.N. Successful adjustment of the automatic inlet valves and carburetter is the secret of slow running. (5.) Your idea of setting the exhaust valve is correct, but the inlet valves should have an opening of about $\frac{3}{32}$ in. (6.) The machine was manufactured by the Fabrique Nationale d'Armes de Guerre (the Belgian Small Arms Co.), of Liège.

Wiring.

[?] I have just purchased a 1914 Harley-Davidson. The previous owner has had it stored for several months, and when removing the accumulator he did away with all the connections, and I cannot see how to connect it up to the dynamo. Please give me the useful information.—F.H.B.

The negative terminal of the accumulator goes to earth, the earth terminal being a screw on the outside of the battery box; the positive terminal to the generator. If a vacuum switch is fitted, connect this to the top terminal on the switchbox; but a manual switch should be attached to the bottom terminal on the bottom fuse.

IMPORTANT NOTICE.

GOODS MADE IN GERMANY.

The proprietors of this journal, being fully in accord with the recommendations agreed upon at the Paris Economic Conference, give notice that they will not permit the advertisements of new goods manufactured in enemy countries to appear in this publication.

ILIFFE & SONS LTD.

Dismantling a Gear Box.

[?] I shall be obliged if you will tell me how to dismantle the gear box of a 7.9 h.p. 1916 model American Excelsior. I have removed the box from the frame, opened the clutch and removed the plates, also one circular nut on the shaft, but I cannot get the inner portion of the clutch, including the chain wheel, off the shaft, and it is apparently necessary to remove this to get at two of the screws which hold the gear box shell together. I have tried gentle hammering of the shaft supporting the chain wheel, but without result. I do not want to use too much force. The other end of the shaft, the one carrying the small chain wheel and the kick-starter ratchet, does not seem to be any easier to dismantle. If you can give me any directions for dismantling the gear box I shall be extremely obliged. There are some indications of feathers, but I am not sure, and if they exist there seems to be no way of extracting them. Are there any left-hand threads?—J.W.O'N.

To remove the chain wheels, get two hard wood wedges and drive them one each side of the chain wheel, between it and the gear box; then screw the nut on a couple of threads and hit it smartly with a hammer. This should drive the wheel off without difficulty, or you may hit the end of the shaft with a heavy mallet or a lead hammer; it does not matter which so long as you take precaution that you do not damage the thread. The shafts are tapered and the chain wheels are secured by keys.

Racing.

[?] (1.) What is the distance of a Brooklands lap? (2.) A friend of mine had a 1912 Zenith, and in wet weather he found the gear lever almost impossible to turn. Is this always so on Zeniths? (3.) What is the address of the owner of Herne Hill racing track, and also the address of the owner of Canning Town track?—J.S.N.

(1.) The distance of one lap at Brooklands Track is 2 miles 1,263 yards. (2.) No; the trouble was probably due to grit, and could be cured by washing out with paraffin and oiling. (3.) Herne Hill is owned by the London County Athletic Club, Burbage Road, Herne Hill, London, S.E., but Canning Town track no longer exists.

EXPERIENCES WANTED.

"A.W.F." (Knutsford).—Four-cylinder 8-10 h.p. Henderson and sidecar. Consumption, speed, reliability, and hill-climbing capabilities; brake power.

RECOMMENDED ROUTES.

RUABON TO BLACKPOOL.—R.G.T.
Ruabon, Wrexham, Chester, Birkenhead, Liverpool, Ormskirk, Rufford, Tarleton, Longton, Preston, Kirkham, Blackpool. Approximate distance, 76 miles.

COVENTRY TO MANCHESTER.—A.B.
Coventry, Fillongley, Kingsbury, Fazeley, Lichfield, Armitage, Rugeley, Great Haywood, Stone, Newcastle-under-Lyme, Congleton, Wilmslow, Cheadle, Manchester.

NORTHAMPTON TO RIPLEY (DERBYSHIRE).—N.G.B.

Northampton, Kingsthorpe, Brampton, Husbands Bosworth, Wigston, Leicester, Mount Sorrel, Loughborough, Derby, Little Eaton, Ripley. Approximate distance, 56 miles.

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Motor Cycle."

The A.B.C. Motor Cycle is
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and establishes a new era in
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They will be pleased to hear from Agents desirous of representing the A.B.C. Motor Cycle in their district.

Detailed particulars and prices will very shortly be issued.

It is an A.B.C. proposition and an All chance not to be missed, so get in touch with Godfrey's right away.

GODFREY'S, LTD.
208, Great Portland Street, London, W.1.

'Phone : 7091 MAYFAIR (2 lines).

In answering this advertisement it is desirable to mention "The Motor Cycle."

TWO GOOD THINGS!

N.U.T.s

3½ Twin, Three-speed.

METRO-

TYLERS

2½ Two-stroke, Single and Two-speed.

We beg to announce that we have been appointed sole agents for the sale of the above two well-known motor cycles for the following districts:

The whole of LONDON and of the counties of MIDDLESEX, KENT, SURREY, SUSSEX, ESSEX, HERTFORDSHIRE, and a portion of BUCKINGHAMSHIRE.

We have acquired the sole selling rights for the machines mentioned over the above districts, and are now able to book orders for definite delivery. We are also open to consider the appointment of suitable sub-agents, and anyone interested should get into early communication with us. The principal details of the machines are as follows:

A. The N.U.T., made by the Newcastle-upon-Tyne Motor Co. This machine was famous before the War, both for speed and reliability. The firm are concentrating all their energies on the production of one type—a super-efficient 3½ h.p. “V” Twin, three-speed countershaft gear, hand clutch and kick start. This machine has done wonderful things on test, details of which will shortly be available. It is equally suitable for solo or sidecar work, for speed on the open road, or flexibility in traffic. The price is not yet definitely fixed, but will be announced at an early date. Definite delivery can be given in MAY, and the price will be competitive.

B. The METRO-TYLER. This machine is the outcome of the combination of two firms, both well known before the War as the respective makers of the METRO and TYLER Lightweight Motor Cycles. The best features of these two machines have been combined, with the result that a super-excellent lightweight has been evolved.

This is a 2½ h.p. two-stroke, of most attractive appearance, the frame having a sloping top tube, with sloping tapered tank. The machine is fitted with Brampton Biflex Forks, and is luxuriously equipped throughout. It is finished in dark red, and disc wheels can be added if desired. The engine is super-efficient, giving good speed, flexibility, and perfect firing at all speeds and under all conditions. A demonstration model can be inspected at our Hampstead address.

PRICES: Two-speed Model, **£52 0 0**

Single-speed Model, **£46 0 0**

EXTRAS: Disc Wheels . . . **£2 10 0** the set.

Long Plated Exhaust Pipe, **10s.**

DELIVERY—Fourteen Days certain.

We shall shortly be opening extensive showrooms in Great Portland Street for the exclusive handling of these two machines, and we confidently recommend them as the very best of their respective types. Meanwhile, we invite prospective purchasers, both private and trade, to get into immediate touch with us. A supply of catalogues for both the above will shortly be available.

Remember also that our stock of other new and second-hand machines is still the best in London, and that we can book your order for earliest delivery of **ANY** make.

Phone: Hampstead { 5392
4904

RIDER TROWARD & Co.

Open till 8 p.m., and on
Sundays.

31, 40b & 78, High Street,

One minute from Hampstead
Tube Station.

HAMPSTEAD, N.W.3

MISCELLANEOUS ADVERTISEMENTS.

PRICES.

ADVERTISEMENTS in these columns—First 12 words or less 1/6, and 3d. for every two words after. Each paragraph is charged separately. Name and address must be counted. Series discounts, conditions, and special terms to regular trade advertisers will be quoted on application.

Postal Orders sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd., and crossed** & Co.

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.4.), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge. Only the number will appear in the advertisement. All replies should be addressed "No. 000, c/o 'The Motor Cycle,' 20, Tudor Street, E.C.4."

DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pays carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged when under £10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

MOTOR CYCLES FOR SALE.

A.B.C.

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery of the new A.B.C. [2254]

Abingdon.

A BINGDON King Dick, 3 1/2 h.p., free engine; a bargain, £15.—337, King St., Hammersmith. [2915]

A BINGDON King Dick, 3 1/2 h.p., 1913, T.T. model, adjustable and free engine pulleys, all accessories £25.—Ex-Airo, 8, Haverall Villas, Green Lanes, South Tottenham, N.15. [3124]

A.J.S.

CROW Bros., Guildford.—A.J.S. Agents since 1912. Write us for your requirements. [9777]

A.J.S. 1914 Combination, complete, perfect order.—Dr. Crook, H.M.S. Excellent, Portsmouth. [X2816]

19 A.J.S. Combinations.—Write Merrick's Stores, 174, Listerhills Rd., Bradford. 'Phone: 2439. [X2435]

A.J.S. Combination.—Book your order now for earliest possible delivery.—Parker's, Bradshawgate, Bolton. [X2889]

A.J.S. 6h.p. Twin, 2 speeds, chain drive, kick, case sidecar, good order; 58 gns.—Waterson, Percival Parade, Worcester Park. [3144]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery of the new A.J.S. [2255]



EARLY Deliveries of P. & M.

**B. S. A.
JAMES
ROVER
LEVIS
NORTON**

**TRIUMPH
MATCHLESS
BLACKBURN
NEW IMPERIAL
ROYAL ENFIELD**

WE are now booking orders for execution in strict rotation, and fully expect deliveries of all the above makes during the coming four weeks. We quote highest prices for allowances on your present mount, and easy payment terms if desired.

SECOND-HANDS.

RUNABOUTS AND CARS.

MORGAN, 1915, 10 h.p., G.P., overhead valves **£165**
MATHIS, 1914, 8 h.p., 3-seater, clover leaf **£225**
PHENIX, 1913, 11.9 h.p., 3-seater, and dicky **£150**
STELLITE, 1914, dicky seat, being overhauled **£230**
ENFIELD, 1915, dynamo lighting, yellow and black **£265**
G.W.K., 1915, standard, being overhauled **—**
CALCOTT, 1916, dynamo set, standard **£325**
FORD, 1914, 4-seater, Stepany, good order **£135**
WOLSELEY, 1912, 12-16 h.p., Landaulette **£375**
PEUGEOT, 1914, 8 h.p., sports body **£195**
MORGAN, 1916, 10 h.p., G.P., 4 speeds **—**
MORGAN, 1915, 8 h.p., G.P., all out **£145**

SIDECAR COMBINATIONS

SUNBEAM 1914 Combination, as new **£60**
B.S.A., 1914, 4 1/2 h.p., 3-speed, nice order **£60**
NORTON, 1916, 4 h.p., Norton Sidecar **£100**
SUNBEAM 1914 3 1/2 h.p. Comb., all lamps **£70**
P. & M., 1914, 3 1/2 h.p., Sidecar, as new **£60**
ROVER 1918 3 1/2 h.p. Comb., almost new **£100**
HARLEY-DAVIDSON 1917 7-9 h.p. Comb. **£130**
SUNBEAM, 1916, 7 h.p., M.A.G., det. wheels **£130**

SOLO MACHINES.

LINCOLN-ELK, 1914, 2 1/2 h.p., 2-sp., nice order **£20**
SUNBEAM, 1916-17, 3 1/2 h.p., 3-sp., like new **£95**
LEVIS, 1916, Popular model, like new **£30**
DOUGLAS, 1913, 2 1/2 h.p., 2-sp., just overhauled **£36**
DOUGLAS, 1914, 2 1/2 h.p., 2-speed, nice order **£36**
RUDGE, 3 1/2 h.p., 1913, fixed gear, very fast **£20**
REGAL, 1914, 2-speed, all accessories **£36**
P. & M., 1914, 3 1/2 h.p., 2-speed, kick-starter **£48**
TRIUMPH, 1914, 2 1/2 h.p., Junior, 2-speed **£40**
TRIUMPH, 1908, requires repairs **£25**
RUDGE, 3 1/2 h.p., T.T. model, original tyres **£33**
RUDGE MULTI, 1915, 3 1/2 h.p., Isle of Man **£60**
ENFIELD, 1917, 3 h.p., twin, speedometer, as new **£60**

NOTE.—One or two of these mounts are not at the moment overhauled, and since we are still very short of skilled labour, we are prepared to make a reduction to any clients who might desire to take the machines as they are.



**100, Gt. Portland St.
LONDON, W.1.**

Telephone Mayfair 52
Telegrams "Abdicare, Wesde London."

MOTOR CYCLES FOR SALE.

A.J.S.

A.J.S.—For the earliest possible deliveries of 1919 models, advance specifications and super service, try the A.J.S. Specialists, The Walsell Garage, Wolverhampton St., Walsall 'Phone: 444. [X0125]

A.J.S. Combination, late 1916, Lucas dynamo lighting set, detachable wheels, spare wheel, hood and screen on sidecar, extra heavy tyres all round, as new; £130, no offers.—Douglas Morspuss, Sedgley, Dudley. [X2824]

A.J.S. Late 1914 6h.p. Combination, fully equipped, splendid condition, just overhauled by maker, coachbuilt sidecar, 2 lamps, tools, and spare parts to value of £5, tyres excellent; owner forbidden to ride by Medical Board; lowest price £85, no offers; seen by appointment only.—Lieut. P. John Webb, Framlingham, Suffolk. [X2767]

6h.p. A.J.S. Service Model, left works December, 1918, with sporting coachbuilt sidecar, patent wind screen, storm apron, 3 Hnat's electric lamps and 2 Hellenes batteries in case, mechanical horn, ridden 100 miles only, really brand new throughout; £145.—French, c/o Robinson's Garage, Green St., Cambridge. [3186]

A.J.S. Spares; prompt delivery.—Cyril Williams, Chapel Ash Depot, Wolverhampton. [9189]

Alldays.

ALLON, 2 1/2 h.p., 2-speed, 1916, as new; 28 gns.—101, Aylesbury Rd., Waltham, S.E. [3043]

ALLDAYS, 2 1/2 h.p., 2-stroke, perfect running order; £22.—Nash, 155, Goldhawk Rd., Shepherd's Bush. [3076]

ALLON.—New 2-stroke 2-speed models, with hand operated clutch, £55; delivery from stock. [X2900]

ALLDAYS-MATCHLESS, 1914, 2 1/2 h.p., 2-stroke, Cowey speedometer, head lamp, horn, spare tank, tools; £20.—Rickett, Brockham House, Brockham, Betchworth. (D) [3045]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery 2-speed and clutch Allons, £58; also De Luxe models, with kick start, £65. [2258]

ALLON, 1919, single-speed, £39/12; also 1916 2-speed, hand clutch, all accessories, £42/10, also 1915 2-speed, all accessories, £36; exchanges arranged.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [3206]

Antoine.

3h.p. Antoine, requires slight repairs; £11, offers.—B., 76, Grange Walk, Bermondsey. [2961]

Ariel.

1914 3 1/2 h.p. Ariel, new condition; £25, bargain.—29, St. Leonard's St., Bromley-by-Bow. [3094]

ARIEL, 1915, 6h.p., electric lights, 2-seater sidecar; £77/10; exchange Mags or 2-seater.—255, Darlish Rd., Bournbrook, Birmingham. [X2876]

5-6h.p. 1914 Ariel, T.T. bars, many extras, Millford Empress sidecar; £46; exchange for first-class Morgan with adjustment.—Lt. Ellis, Gratsa. [X2691]

RIDER TROWARD and Co., 31, High St., Hampstead.—New 3 1/2 h.p. 3-speed Ariel in stock, £80. Orders being booked for earliest delivery 5-6h.p. combination. [2257]

Auto-Wheels.

WALL Auto-Wheel, with cycle, in sound running order, and complete; £12, no offers.—Lt. Frain, R.A.S.C., Grove Park, S.E. [X2862]

Bat.

8h.p. Bat, late 1913, hardly used during war, 2-speed, kick starter, spring frame, 3 lamps, 3 generators, unspratched, canoelet sidecar; £62, or exchange for slightly lower power combination.—7, Park Hill Rise, Croydon. [2950]

Blackburne.

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery of new Blackburnes; 2 1/2 h.p., 2-speed, clutch, £60; 4h.p., 3-speed, £80; 6h.p. combination, £125, or with spare wheel £130. [2256]

Bradbury

4h.p. Bradbury, 3-speed, and sidecar; quick sale £30.—Clapham (Motors), 119, King George St., Greenwich, S.E. [X2927a]

1912 4h.p. Bradbury, 3-speed, good condition; £26, or near offer.—Taylor, 16, Guys Cliffs Terrace, Warwick. [X2836]

BRADBURY, 1912, 3 1/2 h.p., little used, engine as new, condition generally perfect, with Lucas head lamp and accessories; £18.—Hall, next to Green Man, High Rd., Whetstone, N.20. [2949]

Brough.

BROUGH, 1916, 3 1/2 h.p., S.A. countershaft, h.b. controlled clutch, semi-T.T. Amac, Thomson-Bennett mag.; £55.—Lawrey, 26, Clarence Rd., Walmer, Kent. [3048]

MOTOR CYCLES FOR SALE.

B.S.A.

B.S.A., 3-speed, 1919 models in stock.—Reys, 378, Euston Rd. [2972]

NEW B.S.A.'s in stock: immediate delivery Model K.—Alexander, Agent, Wallasey Village. [1506]

1919 New B.S.A., 4½ h.p., belt-cum-chain; £79/16; exchanges considered.—Deane, Matlock Bath, Derbyshire. [X2906]

B.S.A., 3½ h.p., 2-speed, F.E., good condition, engine overhauled; full particulars on application; £220.—Morgan, 6, Ash Ville, Tredegar, Mon. [2971]

DELIVERY from Stock of Model K B.S.A. chain-cum-belt 4½ h.p.; £79/16.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C.3. [0552]

1917 Model K B.S.A. and Coachbuilt Sidecar, fully equipped, under 1,000 miles; also 1916 model, as above; sell either one.—Coffin, Holwell, Sherborne. [X2958]

B.S.A. (2), belt-cum-chain models; 76 gns.; actually in stock; exchanges arranged.—Lamb, 151, High St., Walhamstead, and 50, High Rd., Wood Green, N. [3201]

1917 B.S.A. Combination, all chain drive, 2-speed, kick start, speedometer, apron, lamps, perfect condition; £90, or exchange higher power.—Melrose, 1, Kenton Rd., Tooting. [3031]

1913 B.S.A. Combination, 2-speed, free engine, kick starter, complete with lamps, horn, and generator, in excellent condition; £38/10.—Emsen, 58, High St., Finchley, N.12. [3137]

B.S.A.—For the earliest possible delivery of 1919 models, advance specifications and prices, sole district agents, The Walsall Garage, Wolverhampton St., Walsall. 'Phone: 444. [X0126]

1917 4½ h.p. Chain-cum-belt B.S.A., in excellent condition, new cover and tube to rear wheel, original tyre on front, lamps, horn, and accessories; owner bought car; £60.—Drake, Sutton, Ely. [X2787]

FOR Earliest Delivery B.S.A., place your order with us. Free insurance policy with every machine ordered before March 7th.—The Brook Motor and Engineering Co., Withington, Lanes. [X2727]

RIDER TROWARD and Co., 31, High St., Hampstead.—New 4½ h.p. B.S.A., chain-cum-belt, in stock, £279/16. Orders being booked for earliest delivery chain drive model, £31/18. [X2592]

B.S.A. 1916-1917 4½ h.p. Cycles, with 3-speed gear box and countershaft, with sidecar, complete with lamps; prices £75, and £80 respectively.—Apply to Lebus's Garage, Ferry Lane, Tottenham, N. [2932]

WALBRO Motor Works, Ely, Cambs.—B.S.A. 1914 combination, No. 1, £29 sidecar, 3-speed countershaft, chain-cum-belt; this combination is absolutely as new, only ridden about 6 months, plating and enamel good as turned out from works; £65. [X2592]

4 h.p. B.S.A., late 1914, and excellent Gloria sidecar, all-chain drive, 3-speed, stored 2 years till lately, exceptionally powerful engine, mechanic owner; full particulars on request; £55, lowest; this is a genuine bargain.—Box L8,811, c/o The Motor Cycle. [2929]

Calthorpe.

1919 Calthorpe 2-stroke, absolutely new, 2-speed, free engine; 39 gns.—Stevens, Louvaincourt, Ashstead. [X2952]

CALTHORPE Motor Cycles.—All models in stock for immediate delivery: no permits required.—P. J. Evans, 91, John Bright St., Birmingham. [0955]

RIDER TROWARD and Co., 31, High St., Hampstead.—Calthorpes, 2½ h.p., 2-stroke, 2-speed, 40 gns.; 2½ h.p., J.A.P., 2-speed, 45 gns.; immediate delivery. [X2260]

CALTHORPE Junior, lightweight, 4-stroke, 2 speeds, free engine, Dunlops, perfect order; price £20; seen by appointment.—R.B., 136, Harrington Rd., South Norwood, London, S.E. [2937]

1916 2½ h.p. Calthorpe-Jap, Enfield 2-speed, drip feed, sloping tank, lamps, tyres excellent, machine perfect order; £34, or would exchange Morgan.—Bennett, Ridgeway, Cumnor Hill, Oxford. [2943]

CALTHORPE-J.A.P., 1915, 2½ h.p., Enfield 2-speed, Lucas lamps, Senspar, X'Fall saddle, useful accessories, spares, excellent condition; seen week-ends or appointment.—13, St. George's St., Ealing. [3060]

1915 2½ h.p. Calthorpe-Jap, 2-speed Enfield gear and clutch, Stewart speedometer, Lucas head and tail lamps, mechanical horn, mileage 2,000, excellent condition; 27 gns.—Hayercraft and Son, 31, Tranquil Vale, Blackheath. [X2826]

CALTHORPE Lightweight (4-stroke), 2-speed, first-class condition, engine, enamel, and plating; £24; exchange 3½ h.p. cash adjustment; Jones speedometer, 80 m.p.h., new, unused, £3/17; Pasha head light (self-contained generator), 12/-.—Richardson, 72, Edgbaston Rd., Birmingham (D). [2940]

Camplon.

1918 Camplon-Jap, 2½ h.p., 2-speed, free engine, lamps, generator.—Simpson, 274, Well Hall Rd., Eltham, London. [2960]

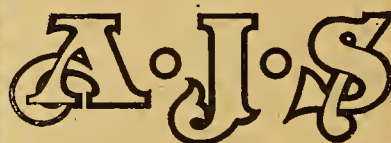
4 h.p. Camplon-Jap, N.S.U. 2-speed, in good order; £20, or offer.—Gutteridge, Watchmaker, Market Harborough. [X2866]

WALBRO Motor Works, Ely, Cambs.—Camplon 1914 2-stroke; all in nice order, 2 new Dunlop studded tyres, Bosch mag., good belt, mechanically sound; £24. [X2593]



Sole London Agents

for



and

British Excelsiors.

WITH BRITISH BRAINS AND

BRITISH MATERIALS—BEHIND

THEM.

Designed to meet the requirements of both novice and expert. A tour can confidently be taken anywhere—at any time—inexpensive to run, but as reliable as the most expensive car. No outlay from tyre troubles when carrying the A.I.S. spare wheel, included in the price charged for the whole outfit. A boon to the keen commercial man and doctors. If you desire to tour peacefully at Easter, please communicate with us immediately. We have large contracts for the following makes:

A.J.S., EXCELSIOR, TRIUMPHS, DOUGLAS, ENFIELDS, B.S.A., P. & M., HENDERSONS, HARLEY-DAVIDSONS, IMPERIAL J.A.P.'S, Etc.

May we send you particulars?

Special consignment, just arrived, of Sidecar Chassis, dual frame, 650x65 wheel for underslung hodies, suitable for 6-8 h.p. machines. Price (less tyre) .. £7 19s. 0d. Price for 3½ h.p. machines .. £6 17s. 6d.

Watsonian Coachbuilt Sidecars, for 2½ and 3½ h.p. machines .. £15 10

Handlebars, Douglas T.T. pattern, ½ in. or 1 in. stem .. price 15/-

F.W.R. Aluminium Electric Head Lamps, for lightweight .. price 12/6

Ditto, Sidecar Lamps .. " 9/11

Ditto, Tail Lamps .. " 9/11

Sidecar Lamp Brackets .. " 1/6

4½ volt. H.H. Batteries .. price 13/6

4 volt 20 amp. Store Accumulators —

4 volt 40 amp. Store Accumulators —

4v. 2cp. bulbs for same .. each 9d.

Triumph Mechanical Horn, for top tube or handlebar 27/6

Repair rents in your overalls or mackintosh with Mend-A-Tear, supplied in khaki or black price 1/- (Postage, 3d.)

Lucas and P. & H. Lamps and Horns in Stock. A limited supply only.

H. TAYLOR & CO., LTD.

Showrooms: 21a, TORE STREET, W.C.1. Wholesale: 38, ALFRED PLACE, W.C.1.

Garsie: Tottenham Court Road. 'Phone—Museum, 1240. Telegrams—"Dynametro, Westcent, London."

MOTOR CYCLES FOR SALE.

Camplon.

CAMPION-J.A.P., 4h.p. twin, 2-speed countershaft and clutch, all-chain drive, 1914 model, running order, but needs overhauling; £30.—Longman Bros., 2, King's Parade, Acton. Tel.: 1578 Chiswick. [3172]

Chater-Lea.

1915 Chater-Lea, No. 7, 8h.p., 1916 engine and gear box, light C.B. sidecar, Indian red disc wheels, perfect; £75.—Gerard, 10, Belmont Av., Edmonton. [3014]

CHATER-LEA, 8h.p., Jardine 2-speed countershaft, all-chain drive, nearly new tyres all round, extra large sidecar, generator, 3 lamps, just been enameled throughout, little used during war; exchange for less power Douglas, or B.S.A. preferred, or sell £48; after 6, or a P.C. before.—A.G., 5, Mansell Rd., Acton, W.3. [2918]

Chater-Lea-Jap.

1911 Chater-Lea Combination, No. 7, 8h.p. J.A.P. engine, 1918 pistons and cylinders just fitted Binks carburettor, 2 tanks fitted, will run on paraffin; £45.—Jackson Bros., Builders, Eastleigh, Hants. [X2758]

Clyno.

CLYNO.—Earliest deliveries. Your name on our list ensures this.—Martin Mitchell, Ltd., Stafford. [X2920]

CROW Bros., High St., Guildford, West Surrey agents for the 1919 Clyno. Order now to ensure early delivery. [1563]

6h.p. Clyno Coachbuilt Combination, 2 speeds, chain drive; £36.—27, Wilton Av., Chiswick, London. (After 7 o'clock.) [3182]

1914 5-6h.p. Clyno and Sidecar, 3-speed, condition as new, very little used, new Stewart speedometer; price 55 gns.—Dapp, Altona, Radlett, Herts. [2986]

CLYNO Combination, 5-6h.p., large luggage carrier, etc.; £40; also Ilex solo, requires ignition and few new spokes; £15.—Hills Garage, Dartmouth. [X2722]

CLYNO 6h.p. Coachbuilt Combination, 2-speed, kick start, lamps, horn, speedometer, etc.; best offer over £40 accepted.—Apply, Motor, 80, Bromfield Rd., Clapham. [X2759]

CLYNO Combination, 1916, 6h.p., 3-speed, kick start, spare wheel, luggage carrier, petrol can holder, electric lamps, tools, spares, splendid condition; any trial; must sell; £85.—Ivydell, Southfield Park, Pinner, Middlesex. [X2891]

Connaught.

1915 Connaught, 2-stroke, new Dunlops; 17 gns.—Chalkley, 2, The Broadway, New Southgate. [3132]

Coventry Eagle.

COVENTRY Eagle, 1915, 2-stroke, T.T., perfect little machine, as new; £24.—51, Maplethorpe Rd., Thornton Heath. [3030]

Diamond.

DIAMOND, new 2-stroke, with 2-speed gear; 37 gns.; exchanges.—Parker's, Bradshawgate, Bolton. [X2901]

DIAMOND, new Xmas, 1917, 2½ h.p. J.A.P., 2-speed gear, clutch, P. and H. lamps, horn, new tyres, excellent condition; £34.—P. Granger, Wyke, Hudd. [X2775]

Dot.

8h.p. Dot-Jap, 1912-1913, 3-speed Chater gear, kick start, handsome coachbuilt sidecar, little used, lately overhauled, lamps, fast, powerful, rare bargain; £59; also 7h.p. Bat-Jap, Whittle, sidecar, 2-speed Fittall gear to fit, sporting combination, £21, near offers considered.—Gordon, c/o Jones, 17, Cleveland Mews, London, W. [2991]

Douglas.

NEW Douglas in stock shortly at Gourlays, Fallowfield, Manchester. [1781]

DOUGLAS, 1914, 2-speed; £40; any trial.—J. King, 123, Pownall Rd., Dalston. [3063]

1914 Douglas, 2 speeds, sound, but wants tuning up; £22.—Cross, Jeweller, Rotherham. [X2916]

DOUGLAS, 1915, 3-speed, 2½ h.p., in good condition; £42.—Box 2,744, c/o The Motor Cycle. [X2724]

DOUGLAS, 1915, 2½ h.p., 3-speed, accessories; £43.—Lt. Disney, Rossie, Kingston Hill, Surrey. [2148]

FOR Immediate Cash, cheap.—Late Douglas, new condition.—Ashby House, Hunstanton, Norfolk. [X2814]

DOUGLAS, 2½ h.p., 2 speeds, T.T. model, very fast; £35.—Driscoll, 58, Woodfield Rd., Ealing, W.5. [3103]

DOUGLAS, 1911-12, 2-speed, running order, lamps, complete; £20, or near.—3, Warren Rd., Reigate. [3120]

2½ h.p. Douglas, 2-speed, new condition; £40; seen any time.—Wright, 113, Blair St., Poplar, London. [3134]

4 h.p. Douglas, 1915 Colonial model, with Phoenix coachbuilt sidecar, accessories; £60.—Ely, Gurs, Maldon. [X2357]

1913 Douglas, 2-speed, just overhauled, good condition; £35.—J.W., 112, Herbert Rd., Plumstead, S.E.18. [X2880]

DOUGLAS in Stock, 4h.p. combination, £95; War Office 2½ h.p. model, £60, new.—Moffat, Yeovil. 'Phone: 50. [1103]

DOUGLAS, 1914, 2-speed, T.T. bars, good condition; 30 gns.—41, Church Crescent, Church End, Finchley, W.3. [3100]

THE MOTORCYCLE

ESTABLISHED IN 1903

AND FOR OVER SIX YEARS THE ONLY PAPER SOLELY DEVOTED TO THE PASTIME

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The Clubs a Necessity.

THE old saying "Unity is strength" has many applications, but none more true than that in connection with the attitude we should like to see adopted by motor cyclists toward those who would imperil the national prosperity for which so many of them have given their all. It is a psychological fact that the individual motor cyclist is almost always most apathetic concerning that which affects motor cyclists as a whole, yet when several are banded together to form a club, there is none more ready to stand up for his rights. He forms definite opinions on matters of the moment, and he is not slow to proclaim them. He is all for the common good. In a club the trend of popular feeling can always be gauged. The reserved man finds a mouthpiece in the club secretary, and thus the technical press can translate his wants and pass them on to the legislator and the manufacturer.

The present time is the one fraught with the greatest possibilities and consequences to the motoring community as a whole, and it is only the intensely united action of the individuals and the big associations which represent them that will secure them a hearing in the settlement of affairs which concern them so closely. Here, then, is the opportunity of the clubs. What is to prevent them getting into action at once, picking up the broken threads of 1914? We know only too well how many gallant fellows, the mainstay of their clubs, have laid down their lives in the great cause. Some clubs are almost extinct. Yet the aggregate number of motor cycle enthusiasts is surely greater than in the days before the war. What is wanted is a little recruiting among the newly-fledged devotees of the pastime, more publicity and more enthusiasm among the older club members. There should be no need to await the return of all the afore-time members—there is plenty of material to hand, and there is much to be done in which the clubs can be a vital power if they will. But

they must act at once. The most vital question before the motoring world is at present the fuel question. It is most undesirable that the great petrol companies should obtain the control of the home-produced fuel, benzole, which owing to their organisation and means of distribution is a possibility to be considered and resisted by all motorists.

Rear Lights on Cycles.

AT the present moment there is an ill-advised agitation going on amongst a certain section of the bicycling community for the removal of the regulation compelling all road vehicles to carry rear lights. They believe, or affect to believe, that motorists are the cause of the retention of this regulation. It is quite true that motorists welcomed an Order which was obviously for the public safety and did no more than compel others to do what they themselves were already obliged to do. Everything that can be urged against rear lights on bicycles can also be urged more strongly against rear lights on motor cycles, and yet motor cyclists are not following the German plan of raising a plaintive wail. It is suggested that a bicycle head light enables it to be seen at a sufficient distance; this is true only in the case of about 20% of cyclists. A motor cycle light is generally brighter still, and, moreover, motor cycles are overtaken much less frequently than pedal cycles. It has been suggested in our columns and elsewhere that it is gentlemanly to carry a rear light. We agree: consideration for others is one of the marks of a gentleman—but ridicule has been thrown on this view in some quarters. *Verb. sap.*

Another point: The fact that quite a large number of cyclists carry a red light in front is used to prove that the regulation is complicated. To us it only seems to suggest that the cyclists in question should not be allowed on the roads without a keeper. The only fault we have to find with the red rear light rule is the very inefficient way in which it is enforced by the police.



From a 'Bus Top.

WHEN compelled to travel on a public conveyance in London, eschew tubes and taxis, and mount a 'bus, selecting an off side seat on the top. When seated, do not immerse yourself in *John Bull*, but use your eyes. I had a good pennyworth of smiles by this cheap method the other day—as good as any Chaplin film. It was pitch dark, and the grease was of the greasiest. As we drew abreast of Selfridge's, I heard a terrific squawking from a mechorn, and bending over perceived the ghastliest expression of abject terror I have ever seen on a human countenance. An R.A.F. sidecar was towing a subaltern on a disabled motor bicycle through the thick traffic by a rope about ten yards long. Nearing Marble Arch a vortex of blasphemy steamed up into a shocked sky from the intersecting point of all the traffic lines. There squatted a very frightened officer in a very small car. The bulbs of his side lamps emitted pink pin points of radiance of a c.p. equal to the expiring spasm of a wartime match. The police were deciding what he ought to do: the rest of the traffic was piously declaring where he ought to be. A good penn'orth!

New Motor Cycle Carburetters?

PRESUMABLY, war experience will inspire modifications in road carburetters, especially as road motors are now condemned to use fuel containing about 30% of paraffin. The cost factor may restrict invention where motor cycles are concerned: though there is at least one double choke tube carburetter on the market for our benefit, the accurate manufacture of diffuser jets (e.g., the Claudel-Hobson) is not cheap. I expect the pre-war type of carburetter is tolerably efficient on single cylinders, as it is strongly heated by conduction and fairly well screened from head draughts. But I shall be surprised if we do not see marked alterations in the carburation systems of twins. The combination of a simple mixing chamber, a cool or cold carburetter, and a long, unheated inlet pipe is not good. One designer proposes to lead his inlet pipe clean through the silencer.

Aero Carburetters.

THE other day I had an opportunity of inspecting samples of all the carburetters which were employed on the very latest Allied and enemy aero engines. Carburetters for rotary engines naturally stand in a class apart, and have undergone little development since 1914, but those designed for V, vertical, and radial engines convey one notable lesson. Let it be remembered that the very best petrol has been reserved for aviation—stuff which evaporates if you spill it, instead of leaving a wet stain for two or three days, as our own viscous No. 3 does. In spite of this designers have evidently found that aviation spirit takes a lot of atomising, and their notions imply that

all pre-war carburetters, whether of the car or cycle type, failed in two respects. (1.) They did not atomise the petrol properly. (2.) They did not mix the petrol and air efficiently. I deduce this from three points in the design of 1918 aero carburetters. First, the prevalence of hot water jackets for the mixing chambers. Secondly, the measures taken to heat the main air supply, e.g., by inhaling all air through the crank case. Thirdly, the almost universal application of the double choke tube principle, which (a) partly corrects the tendency to over-rich mixture at high speeds, and (b) creates a specially strong suction centre around the jet, thus breaking up the petrol and mixing it more thoroughly with air.

New Magnetos.

FEW of us have any quarrel with pre-war magnetos, except in so far as the contact breaker arm used to stick up, and this was seldom an affliction to any but the very greenest novice, as the rest of us had suffered from it so repeatedly. Study of the patent lists will show that umpteen inventors have damp-proof contact breakers on the brain, and they will doubtless be standardised in due course. The next commonest trouble related to the pick-up brushes on the high-tension slip ring. These occasionally broke, and occasionally short-circuited owing to "tracking," i.e., an accumulation of carbon dust and oil on the brush path. The war has produced a number of "jump spark" distributors, in which the tip of a metal brush passes a contact segment at a small clearance, so that neither fracture nor shorting can occur. We shall not object to this if it comes our way. With the development of very light engines, the weight of magnetos begins to look excessive. The use of aluminium alloys has cut down the weight of six-cylinder magnetos by nearly 50% during the war, but since the armature and magnets account for the bulk of a tiny single or twin-cylinder magneto, we can hardly expect any marked reduction in our class. Moreover, the price of aluminium is still prohibitive.

A Possible Ignition.

AS many know, the famous Liberty aero engine has no magnetos, but is equipped with coil and accumulator ignition of a very interesting type, which is practically as reliable in use as a magneto. Its special features consist of duplicate main contact breakers and a generator which perpetually renews the youth of the accumulator. As the contact breakers are in duplicate, troubles and adjustments are infrequent. No sane motor cyclist desires a better ignition than the magneto, save only in respect of starting where it compares most unfavourably with the coil and accumulator; the latter gives its best spark at minimum speed, whereas the magneto gives its worst. But if we are going to plump for electric lighting, as seems certain, the situation is perceptibly altered. One and

the same battery-cum-generator outfit may at some future date cater for both ignition and light. When the electrical trade offers us such an outfit, plus its special starting facilities, plus the reliability for which the magneto is famous, we can only make one reply.

For the Cold Stable.

UGH! I have been sampling a sulky engine in a cold stable on an arctic morning with pukka No. 3 spirit—my hoard of 1915 No. 1 having been exhausted. To other sufferers from similar conditions may I commend an injection dope of 50% of methyl ether and 50% of petrol? I believe a rubber pipe from the domestic gas supply is a sound stunt, but, alas! my garage is lit with paraffin, of which the Pool Board No. 3 is already sufficiently redolent.

Leg Wounds and Motor Cyclists.

THE other night I dined with five ex-soldiers, all of whom were ex-motor cyclists with artificial legs. It was an eye-opener to me to learn how walking exhausts such men. One member of the company left Roehampton in 1917, but still finds that a walk of a mile knocks him out on a hot day, and for this reason he has sold out a splendid business in a sub-tropical climate. None of the quintette dares ride a two-wheeler: none of them ever intends to do so again. I am aware that many men with only one natural leg surviving continue to enjoy motor cycling: but the trade should take cognisance of the fact that there are numerous exceptions. They get the wind up for a variety of reasons. The artificial leg suggests an insecure footing, and they dislike handling a mount which cannot stand up by itself. Of course the side-car and the Morgan and the cycle car are available for such men, always provided they can afford the additional outlay. Nevertheless it appears that there may be a distinct, if temporary, demand for something more on the original Carden lines, *i.e.*, the cheap monocar. It is important that the controls should be adaptable for use by men with but one sound leg or one sound arm: I expect the man with an artificial arm feels even more incapacitated for motor cycling than the man with one sound leg. I hope the trade will not leave these unfortunate brethren, who have been crippled in our service, to the chance mercies of their own ingenuity or of agents' adaptations. Most of them have been hit hard in pocket as well as in person, and it is callous to say to a man who formerly pinched to pay £50 for a bicycle, "Oh, you can get the X—cycle car at £150!" We should like to see these men offered a mount they can afford.

The Cone Brake.

A NOVELTY which we are all anxious to try out under road conditions is the cone brake. We had no particular quarrel with the belt rim shoe, so far as use and efficiency went, but it was rather a cumbrous piece of mechanism, especially on chain-driven machines; and we have not the least objection to a brake which is neater, provided it is just as good. The front brake is at present an unsolved problem, and here the cone type may be of special interest. A front brake must not be too powerful, must not be liable to rattle, and must not obstruct wheel removal or tyre repairs. A paper survey suggests that the cone brake should be neat, light, cheap, and self-adjusting for wear. We shall want to be assured that it cannot jam if clogs of mud or small pebbles are flung into it, and that no fresh road for water to enter the bearings is involved. The band brake and the internal expanding type were justifiably moribund before the newcomer appeared. The former could conduct itself with propriety, but was usually a nuisance: the latter suffered from invisibility: the demise of its efficiency was apt to be extremely sudden.

Unbreakable and Unpittable Valves.

THE new steels are going to make minor contributions to our comfort. Exactly twelve years ago I purchased a motor cycle from a leading firm which required a new exhaust valve and new piston rings every hundred miles. In five hours' running on a half-throttle average the exhaust valve scaled away in lumps, and the rings lost all semblance of compression tightness. Things had changed by 1914, but our exhaust valves were always the better for a touch-up when we inspected them, and it was standard practice to carry a spare. Some of the more considerate firms maintained a special sub-section for refacing clients' valves. We took less interest in our piston rings, but nevertheless we noticed that the labour of "turning her over compression" diminished with age. The other day I saw an exhaust valve which had done a hundred odd hours in an aero engine, and barely required skimming before going back for another hundred. This means that there is a possibility of being able to buy overhead-valved engines without fear of frequent hold-ups to hunt for the missing valve head; that valve grinding as a necessary preliminary to any run of length will lapse into comparative desuetude (what a lovely word!); and that there will in consequence be a shade more room in the pannier bag where the spare parts and emergency gadgets live.



A page from a D.R.'s sketch book. A scene familiar to many motor cyclists who have served in France

The Four-cylinder Gonthier Motor Cycle.

Belgium's First Post-war Production.

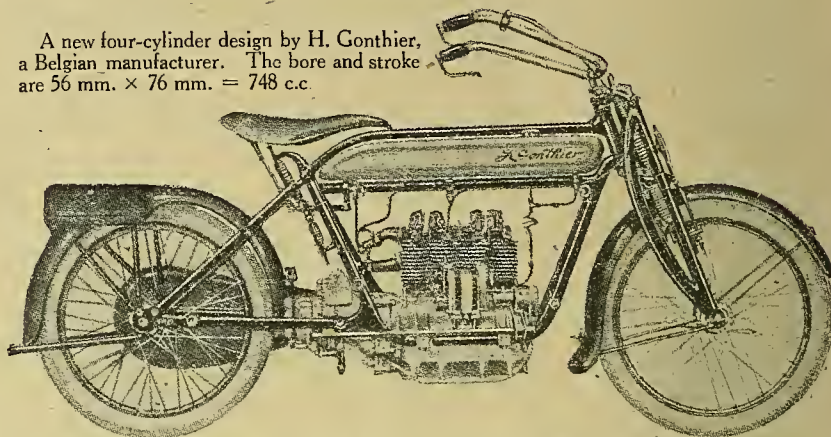
BELGIAN motor cycle manufacturers are making rapid recovery, despite the troublous circumstances which are still extant, and that they are not behindhand in following the trend of modern design is evident from the production of a four-cylinder machine at Liège, the town whose name conjures up gallant memories of the early days of the war, and which, in pre-war days, was the home of another well-known Belgian motor cycle, the F.N. The designer and manufacturer, who has got so quickly to work, is M. Henri Gonthier, well-known in motor circles in Liège.

The Engine.

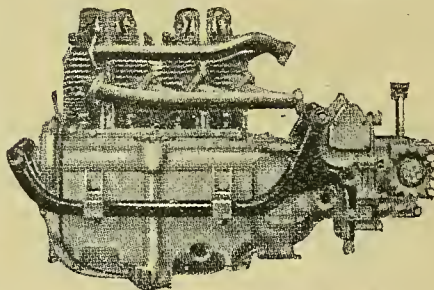
The Gonthier engine has four air-cooled cylinders, each a separate casting, and each with a bore of 56 mm. and stroke of 76 mm., giving a total capacity of 748 c.c. It has overhead inlet valves, operated through adjustable tappet rods. The ball bearing nickel steel crankshaft is mounted on three bearings, following car practice. The pistons, which are of a patented type, carry two rings at the top, and beneath the lower one is formed a deep groove, from which a series of holes give communication to the interior of the piston. Oil is collected in this groove, and any excess is passed through to the interior and so back to the crank case. This must tend to economy in oil and reduce carbon deposit without starving the piston and cylinder walls to any particular degree. Lubrication is effected by a neat mechanical pump, designed to maintain a constant level in the crank chamber.

The engine, clutch, and gear box form one unit, being carried in the loop of a duplex frame. The frame is well designed, and of ample strength for sidecar work. The forks are girder construction, with coil springs and parallel action.

A new four-cylinder design by H. Gonthier, a Belgian manufacturer. The bore and stroke are 56 mm. x 76 mm. = 748 c.c.



The clutch is of the plate type, of large diameter, running in oil. The gear box is constructed to give no fewer than seven speeds, with nine gear wheels, of which only two slide on the shafts. It



Near side of unit, showing method of cradling the engine.

is said to be just as simple to operate as a three-speed gear, and yet it provides a fairly gradual progression from low to high, and *vice versa*.

At the same time, it is possible to overstep the intermediary gears and change directly from low to top or otherwise, as desired. The designer describes the gear quaintly as a three-speed gear with two intermediary gears between first and second, and two

more between second and third. A kick starter is fitted.

Transmission from gear box to rear wheel is by a totally enclosed chain. The carburetter, specially designed for this machine, is operated by a single lever and has two jets. The second jet comes into action at high speeds.

The vaporising chamber is said to be particularly effective in atomising heavy fuels. As to the fuel consumption we have no information, but the design bears promise of economical results.

The method of springing, to which this firm is particularly partial, is a parallel motion incorporating large coiled springs; it is embodied in the saddle, front forks, and sidecar springing, and should prove very effective. The question of mudguarding has been well looked after, the guards being very wide and substantially made, the rear guard having formed in it a compartment for tools and forming a carrier.

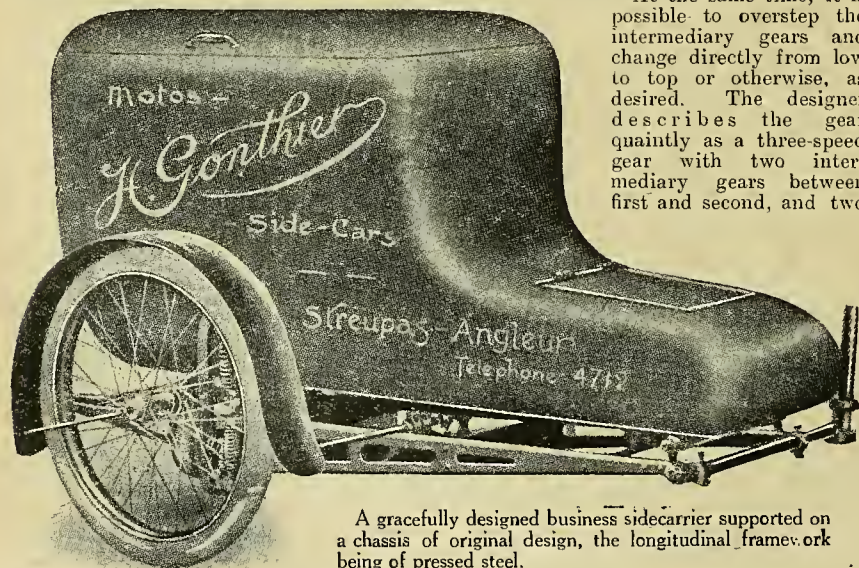
Both wheels are detachable and interchangeable, and when a sidecar is used a spare wheel may be carried.

As regards the sidecar, M. Gonthier claims to be the first to introduce this attachment into Belgium, and makes a distinct departure from usual practice by employing a pressed steel frame with welded joints. The attachments are particularly strong, and the girder type of stay, also of pressed steel, which stiffens the sidecar axle, is a distinctly good point.

The construction of this sidecar chassis is similar to that of aero engine plates, and since so many of our manufacturers have had experience in this class of work during the war, it is not improbable that it will play an important part in motor cycle construction in the future.

As far as we are able to judge, this machine gives great promise, and, provided that production is not interfered with by the aftermath of war, it should form a sturdy competitor in the four-cylinder market.

The firm, previous to the war, was turning out a very useful $3\frac{1}{2}$ h.p. twin-engined machine, and its production is to be resumed shortly. The cylinders are set at an angle of 50° , and it follows standard practice in other details.



A gracefully designed business sidecarrier supported on a chassis of original design, the longitudinal frame work being of pressed steel.

"SOME BARGAINS."

The Treatment accorded ex-Army Machines between the Port and the "Unfit" Park.



THE CHANGING SEASONS. Ex-Army motor cycles at Kempton Park. Since our recent exposure of the rapid deterioration of these disused machines many have been sold by auction, and the remainder are being removed to repairing depots.

DISUSED Army machines are now under much discussion, and probably many of the impecunious brigade of would-be riders are already visualising their cheap mounts.

Now that D.O.R.A. is moribund it will be permissible to give the readers of *The Motor Cycle* some idea of the treatment meted out to unserviceable machines in their passage through the various collecting and repair depots of the Mechanical Transport, and thus warn many unsuspecting souls of the condition in which they may expect to find most unrepaired Overseas machines.

The motor cycles are despatched from the port of arrival in open trucks, packed cheek by jowl, fifteen to twenty at a time, and, as a result of this, the jolting of the journey and shunting, etc., they present an almost inextricable mass to the men whose duty it is to transfer them on to the familiar 3 ton lorry; this process is not usually effected without sundry ruthless and sudden removals of such projections as handlebars, oil pump handles, foot-rests, and carriers; indeed, it is remarkable how efficaciously "streamlining" may be carried out by means of a viciously-applied "ammunition" boot!

The machines are next dumped (literally!) in an "unfit vehicles" park by a receiving staff, who examine and classify the machines, and also remove the valuable "portable property," such as magnetos, carburetters, and saddles.

It may be that familiarity breeds contempt, or may be sheer discomfort in handling rusty, jagged, broken-backed corks (often under the bitterest atmospheric conditions), which is the cause of much damage, for

if at all refractory or awkward it is no uncommon thing for machines to be flung bodily from the lorries to the ground.

Undoubtedly much of the abuse and man-handling is due to the inefficiency of the arrangements for dealing with motor cycles in quantities, and the men who have no better lifting or transporting tackle than their hands are scarcely to be blamed.

The damage done to machines between the actual moment of becoming unserviceable until the time of entry into the repair shops is not to be conceived by those who have not actually seen and dealt with a consignment of two or three thousand corks, and it is safe to say that the ordinary amateur with a *p penchant* for tinkering who buys a damaged army machine will find his purchase dear at any price.

I do not wish readers to take an unduly pessimistic view of my remarks, but I can state definitely that the majority of machines returned from Overseas during the last two years of the war and repaired in R.A.S.C. workshops have required from £20 to £30 worth of replacement parts, and called for repairs quite beyond the scope of the private riders' capabilities.

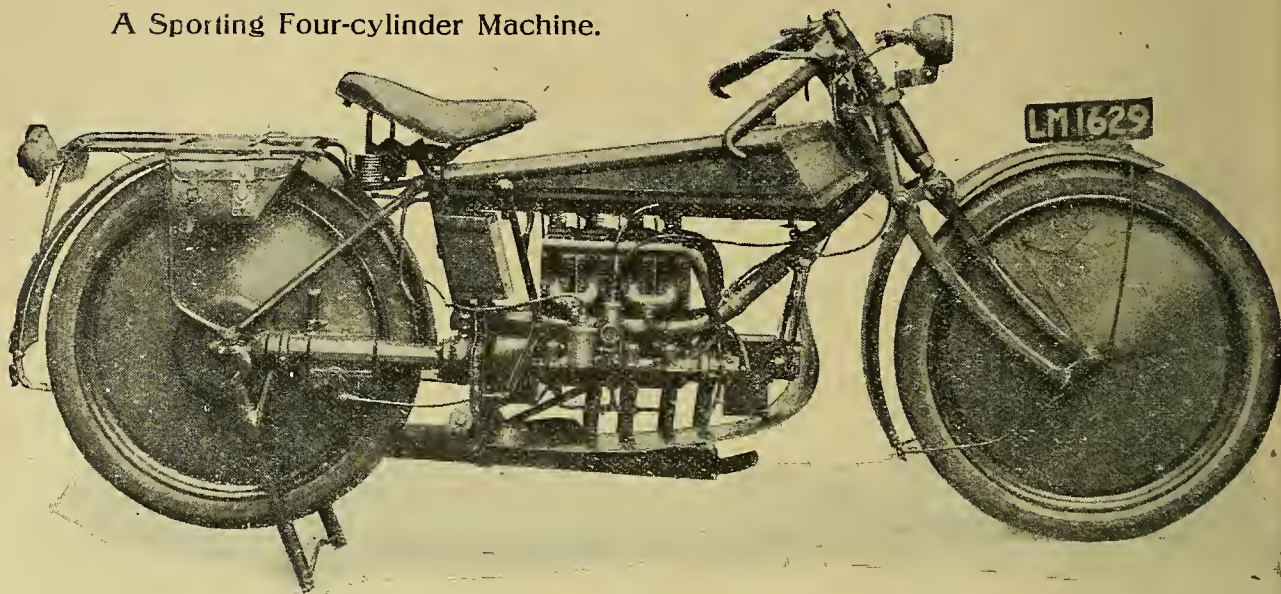
Home-service machines naturally are not so often broken up, but one must remember that they are mostly hacks, and are often used and exposed in a manner no self-respecting motor cyclist would tolerate.

Any machines overhauled by the army, and sold in that state would be really excellent value at £10 to £15 below maker's price, as the standard A.S.C. workshops, at any rate, are to turn out machines practically as new—the only danger being the latent possibility of frame breakage.

WHARFEDALE.

MODERNISING AN OLD F.N.

A Sporting Four-cylinder Machine.



The converted F.N., inlet valve side. A dropped tank, disc wheels, and greater rake add much to its appearance.

RATHER over a year ago many of our readers were interested in the F.N. rebuilt by our correspondent "Olivos," and illustrated by a small picture in our Correspondence column. "Olivos" has succeeded in converting this little engine in a most ingenious manner, changing the existing exhaust valves into inlet valves and fitting overhead exhaust valves. Several alterations were also made to the frame, which has changed a somewhat cumbrous touring machine into one with a very sporting appearance.

Valve Arrangement.

The shoulders in the cylinder valve pockets for the old inlet valves were enlarged and a new exhaust elbow was screwed into each. As will be seen from the drawings, these are neat members accommodating an exhaust valve slightly larger than the inlet; in fact, the area of the exhaust port is .886 sq. in., the inlet area being .601 sq. in. The exhaust rocker standards are screwed into the elbows and means are provided for adjusting the clearance between the rockers and the push rods. The rods themselves are shaped something like a golf club, owing to the necessity of locating the inlet tappet rod so as to work through the tubular

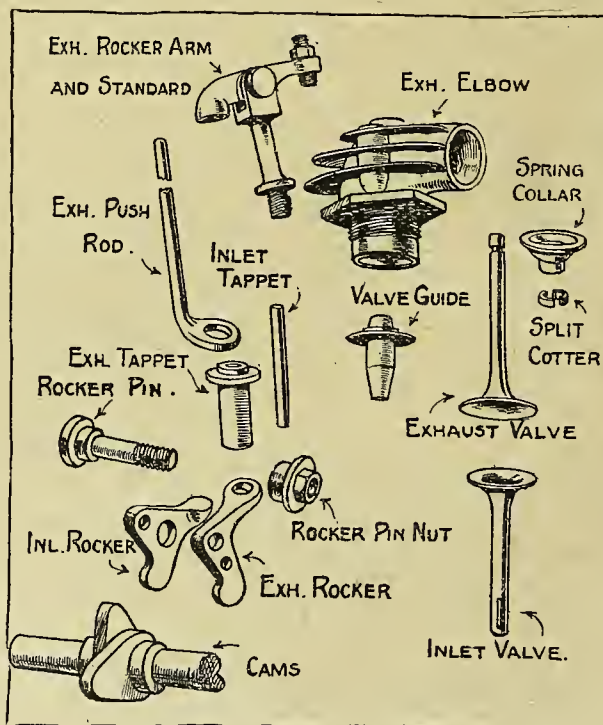
exhaust tappet, which somewhat resembles a tappet guide. The camshaft was provided with cams of 220° for the inlet and 240° for the exhaust, and the new cams were placed beside the old ones, the rockers likewise being side by side. The whole arrangement is extremely neat, and takes up extraordinarily little space.

The ingenious arrangement of the inlet pipe should also be noted, while the method of taking the exhaust away from the cylinder heads to the silencer is particularly effective.

Other Details.

Other alterations to the power unit include drilling the pistons, and turning out the flywheel so as to take a dry plate clutch, while an improved form of gear also has been fitted. An under-shield runs below the whole length of the power unit. The rake of the front forks has been considerably increased, which, we are told, has so improved steering that the owner can ride with his hands off the bar, and skidding is quite unknown.

The top tube is now straight and slopes to the under tube, reducing the saddle height and, with the tapered tank, improving the appearance considerably.



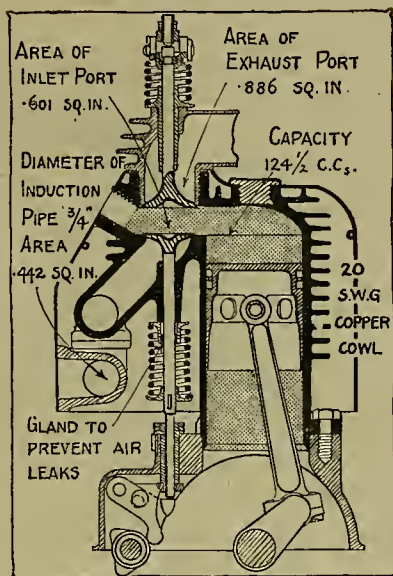
Various parts employed in the conversion.

Modernising an Old F.N.—

The weight of the reconstructed machine is about 300 lb. The owner claims that a speed of 55 m.p.h. has been attained, and at an average of 30 m.p.h. remarkable petrol consumption figures have been obtained; on one occasion these worked out at 100 m.p.g., but the average petrol consumption is 70 m.p.g.

Altogether, the machine with its mechanically-operated inlet valves and improved exhaust valves now provides very much better running, especially at slow speeds, the alterations to the flywheel contributing to slower running.

The original cost of the machine was £3 10s. It is now an excellent example of what can be done by an enthusiastic engineer. As an illustration of the versatility of the motor cycle engine, Messrs. Olivos employ a 2 h.p. 1902 Minerva engine to drive machinery in their works. It is adapted to run on gas, paraffin, or petrol.



A sectional view of the converted F.N. engine, showing the overhead exhaust valves and the rockers actuating the inlet and exhaust. The exhaust valve push rod is not shown in this picture.

Another Rejuvenation.

The four-cylinder machine seems to find favour with many riders of a mechanical turn of mind. The photograph of the rejuvenated F.N., which is reproduced below, came to hand last week from Mr. T. C. Garrett, Merton Park, London, S.W., and in this instance it must be admitted that an exceptionally good job has been made of the alteration. The enthusiasm shown by owners for their restored and modernised machines is quite equal to, and generally greater than, that shown by owners of new machines, and probably there is no type of machine that gives the same pleasure as a four-cylinder when running well. Mr. Garrett has not gone to the trouble of converting the automatic inlet valves into the mechanical type, but the several obvious improvements that were made have transformed the old type F.N. into quite an attractive-looking mount of which any owner might be proud.

THE LADY AND THE MOTOR CYCLE.

I WAS not a little astonished the other day to hear a lady remark that to ride a motor cycle was "unwomanly." I had foolishly imagined that all that particular sort of Mrs. Grundyism had died and been buried since 1914, but what one thinks and gives utterance to may find an echo in the mind of others of our sex.

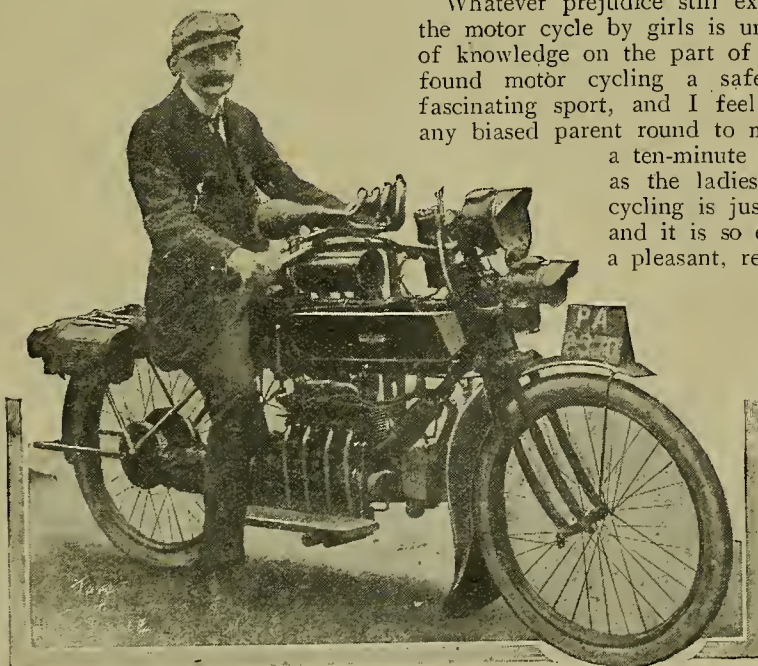
Can a girl ride a motor cycle and still retain every characteristic that is expected of our best young womanhood? I certainly believe so, and my experience and observation covers a period long before the war. There is no coarsening influence incidental to motor cycling, and the only way such can possibly arise is by the rider's deliberate interjection of those elements into the sport. The girl who plays hockey or goes in for basket-ball, for

example, is more likely to get hurt and give way to impulses not exactly lady-like than is the girl who goes motor cycling. Still, many careful parents encourage their daughters to play basket-ball!

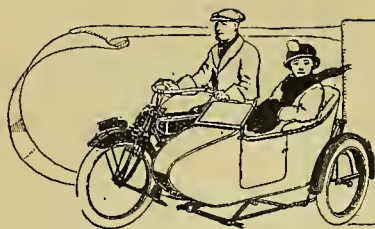
Whatever prejudice still exists against the use of the motor cycle by girls is undoubtedly due to lack of knowledge on the part of the objectors. I have found motor cycling a safe, healthy, and ever-fascinating sport, and I feel certain I could bring any biased parent round to my way of thinking in a ten-minute demonstration. So far as the ladies are concerned, motor cycling is just what they make it—and it is so easy to make it simply a pleasant, refreshing, and economical

pastime that I constantly wonder why more girls do not avail themselves of it. The war has, of course, brought countless recruits, but as one who is heart and soul in the pastime I want to invite and convince its detractors, the majority of whom, I fear, are, as in so many other cases, those who know least about it. There is room for us all.

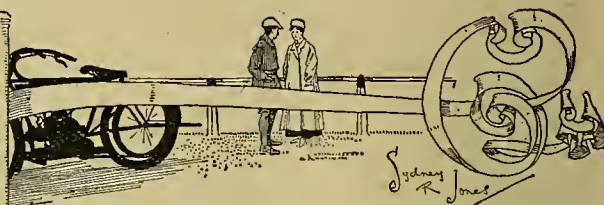
MADGE.



An F.N. owned by Mr. T. C. Garrett. The machine has been partly reconstructed and a new tank fitted. When first purchased its petrol consumption was 40 m.p.g., but by fitting and experimenting with the A.M.A.C. carburetter a consumption of 90 m.p.g. was obtained.



WORK FOR THE CLUBS.



Reminders from Men in the Movement. Revitalising the Pastime.

*By Lt. W. Cooper, who first suggested
the Winter Trials.*

ALTHOUGH the time is fast approaching for many of the boys to be on the open road again, are our club organisers and secretaries ready with their reconstruction programmes?

There is not the slightest doubt there is going to be a wonderful boom in motor cycling club life, and, in order to keep up enthusiasm for the keen members, new competitions must be inaugurated.

Why not revive the Blackpool, Brighton, Saltburn, and Skegness speed trials?


Two of the most successful speed events in the management of which assisted were the Streatham and District M.C.C. open speed trials during 1913 on the Madeira Drive, Brighton, and the Essex M.C.C. speed event, 1914, at the opening of the new promenade at West-cliff-on-Sea, the latter being witnessed by over 10,000 spectators.

Races might be arranged between a fast 500 c.c. pre-war model and a 500 c.c. reconstruction model, and I know of at least two machines which will be able to give the latter a run for its money. Many readers may remember the speedy Matchless-M.A.G. at Westcliff and Doncaster.

Then we have the eight-valve Indian, M.A.G., and Harley-Davidson racers. Is it possible to arrange an event to compete against these foreign giants? A trial for ladies only might be included (many of the fair sex are keen to compete against all comers), whilst many of our speediest despatch riders will be home and anxious to test their riding and driving abilities against the fastest of our cracks. What a time it will be for Stanley (Triumph), Bailey (Douglas), Emerson (A.B.C.), O'Donovan (Norton), Collier (Matchless), and many others.

What club secretaries want to avoid is the irksome 20 m.p.h. split second timing. I suggest that a competitor's time should be taken from his own watch, which might be sealed in a small tin box and fitted with a glass lid.

Another important point to remember is that clubs should encourage the trade man, or at least include in their programmes events for the "trade," maintain that no large club can survive without assistance from the trade. I have a great admiration for the trade rider (and I have competed and ridden many thousands of miles against the best of the trade), and have always found him a gentleman and sportsman of the highest grade, always willing to assist an



Lieut. W. Cooper.

"unfortunate" in distress irrespective of the make of machine on which he is competing.

That gallant sportsman the late Rear-Admiral Sir R. K. Arbuthnot was never so happy as when competing against the best of our trade men, and that is why I am so emphatic about encouraging the trade.

This is the period of reconstruction, and among the many things which have to be built up again are the motor cycling clubs, and the Armistice was scarcely signed before the more energetic ex-clubmen were thinking of competitions and the clubs of the future. In the following four short articles some interesting opinions on this subject are given by four well-known clubmen who in the past have worked hard to encourage the competition and social side of the pastime of motor cycling. We take this opportunity of inviting secretaries to write us concerning the present position of their clubs.

The important trade events can be left in the capable hands of that progressive body the Auto Cycle Union, whose energetic secretary, Mr. T. W. Loughborough, has already outlined in *The Motor Cycle* the Union reconstruction programme.

Shall we see during the reconstruction that popular "social" club the Motor Cycling Club, Ltd., affiliate with the A.C.U.?

*By Mr. J. Simmonds, Hon. Secretary
East Midland Centre A.C.U.*

MOTOR cycling, after its period of quiescence, should again prove itself the premier sport. Have not the airmen—our supermen—told us that nothing can vie with it? Was it not the sport of pre-war days that gave our splendid motor cycling boys the training in nerve, pluck, and endurance, fitting them instantly for the branch of service to which the majority instinctively turned, the Royal Flying Corps? Was it not to an unassuming motor cyclist, a fellow club member, the late Capt. A. Ball, that belonged the glory of winning, I believe, the most, certainly the highest of fighting honours during the war? May not motor cyclists as such do something to perpetuate his memory?

The first time awheel, one will naturally turn one's course to the scenes visited in times gone by, where happy clubmen congregated. The old trial courses will be revisited, the various disasters and brilliant performances of fellow clubmen will be recalled. How vividly we cannot

tell. Already certain hills, each with its particular incident, are indelibly stamped upon my memory, hills that for me will be eternal monuments to the memory of gallant men who have made the great sacrifice.

To the future we look with the greatest hope, both from the sporting and social point of view. As the various clubs in the adjoining counties are again brought into being, arrangements will be made to reinstitute the inter-club trial for the East Midland Centre Challenge Cup. New clubs will be especially welcome, and help gladly given in their formation. No town or village in the East Midlands having half a dozen riders should be left unrepresented. Arrangements have already been made by a few enthusiasts to visit various towns in the East Midlands. A communication from intending club promoters to me at 10, Cranmer Street, Nottingham, will ensure a personal visit from one of our committee to ensure their inclusion in the inter-club events arranged for the coming season.

The question of the banding up of all affiliated clubs into geographical centres should again be taken up by the A.C.U. No difficulty should be found in forming a geographical basis; the only difficulty lies in placating a disgruntled club on the fringe of two centres, one of which I know would rather plough the lonely furrow than join in a centre on the fringe of which it is geographically placed. Mr. Straight, the late secretary of the A.C.U., was keenly interested in the centre matter, and visited Nottingham to form the East Midland Centre, since which time no other centre appears to have got to work, the fault lying mainly with club secretaries themselves. Mr. Loughborough also came to Nottingham in 1914, and outlined a scheme which no doubt will again be brought forward. What we in the East Midlands desire is a national club trial, eliminating rounds to be run off in each centre. The first, second, and third teams to represent their centre in a final from north, south, east, and west. The restriction of entries to about three teams each would prevent the trial from being unwieldy—a fault that was growing far too common. That such a trial could be run is proved by clubs being drawn from great distances in the popular *Motor Cycle* cup competition, which grows more unwieldy year by year, the main cause of such popularity being the great publicity given to it in the pages of *The Motor Cycle*, while trials secretaries of smaller clubs when running a trial are



Lieut. W. Cooper.



Mr. J. Simmonds'

Work for the Clubs.—

restricted, no doubt by reason of the number of weekly competitions of a similar nature, to a comparatively brief paragraph. This is a matter that club secretaries must get remedied.

Reverting to the centre trial question, the trial, if arranged, would be a means of drawing a large number of clubs to the A.C.U., who, by its influence, can command the publicity of the motor cycling press. With the funds at its disposal a trophy and gold medals could be awarded—medals as awarded in *The Motor Cycle* cup competition (which is run free from trade organisation)—medals clubmen would be proud to wear.

By Capt. S. Chas. Perryman, R.A.F.,
Hon. Secretary, Birmingham M.C.C.

AT the moment of writing I am still the hon. sec. of the Birmingham Motor Cycle Club, but for the present am stationed away, and am unable to attend a general meeting of the members which has been called to elect officials for 1919. This is sufficient to show that the Birmingham club is alive and alert and only waiting an opportunity to resume all its old activities. I hope to be closely identified with the fortunes of the club for many years to come, and to assist in the organising of many another Birmingham-Land's End, Birmingham-Carlisle, and Birmingham-Edinburgh run, also in the running of the "Midland

Cup" and the open passenger machine trials, which were so successful before the war upset all our plans. It will be difficult, I think, to initiate any form



Capt. S. C. Perryman.

of trial which will serve the purpose of a sporting test for both machine and rider better than did the pre-war reliability trial, with, of course, the T.T. race as the principal test of the year. International trials or competitions should be fostered. Undoubtedly trade follows the competition, and it should be found possible and worth while to foster and encourage entries from Continental, Colonial, and American riders in our home trials, and to send entries to foreign competitions.

I should also like to see a large development of the inter-club trial, and would put in a plea for a fuller and freer social intercourse between the local clubs of a district. A lead in this direction is being made by the clubs located in the Birmingham district, who are preparing a great reception for the "boys" from the Front on their return. This should be a great event, and is an assured success from the beginning. The idea is one worth following, for undoubtedly the

"motor cycle" and "transport" men, not to mention "tanks," have done some of the best work of the war—work which will merit every scrap of recognition accorded it.

By Mr. Harold Weldon, Hon. Secretary,
Nottingham and District M.C.C.

IT is obvious to all seasoned riders that the only real test and guide to the buyer is the Six Days Trial. This being so, would it not be better for the A.C.U. to concentrate upon it, and leave the one-day trials to the centres or the affiliated clubs? I am of the opinion that half the value of these trials is lost through no record being kept of the quantity of petrol and oil used. The quantity used would probably have been rather startling in the case of certain 11.9 h.p. so-called cycle cars which have competed. Of course, this would create more work for the organisers, but if the way of running were reverted to in which a start is made each day from a different town, the local clubs would help. In fact, they could be made responsible for checking, supplies, accommodation, etc., when the trial passed through their territory. It would certainly create more interest in the local clubs, which is what we want.



Mr Harold Weldon.

A BICAR OR TRICAR AT WILL.

A Remarkable Vehicle designed by an American.

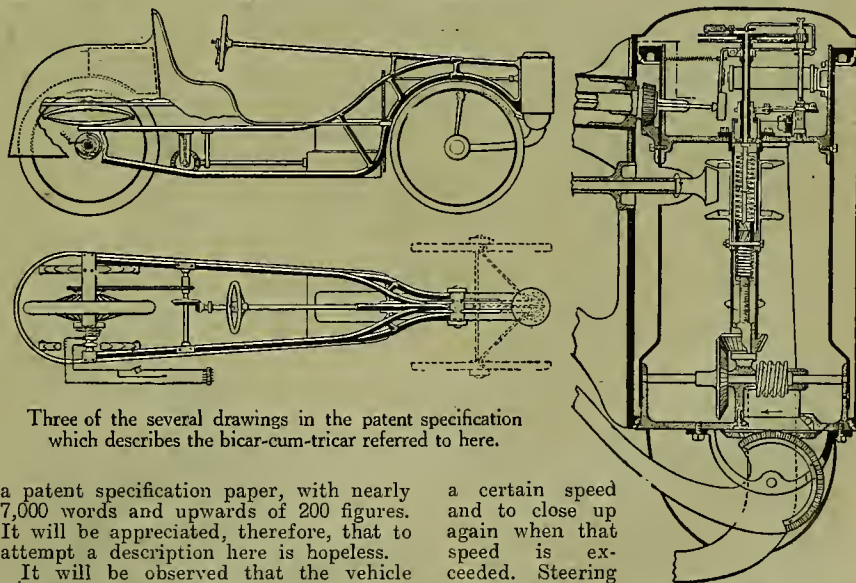
THE laws of evolution are governed by demand. Inventors sometimes forget this, and, instead of devoting their time and ability to producing articles for which there is a certain demand in the immediate future, they get so carried away with their ideas that eventually they reach a point where their inventions border on the ridiculous. The invention illustrated here is in this category, for it is difficult to imagine a vehicle such as is depicted having the least appeal to the motorist, while even the "crank" would hesitate before paying good money for an article so ambitious in character and so complicated in construction.

It is not our intention to give a lengthy description of this brain storm: it is submitted to readers of *The Motor Cycle* only to show to what extent it is possible to stretch the inventor's brain when he becomes possessed of an ingenious idea.

The Object?

The object of the invention is to provide a motor cycle normally operating on two wheels, but capable of being converted while in motion into a three-wheel vehicle of "inherent equilibrium." The front wheels are movable away from and toward each other while the vehicle is in motion at the will of the driver. By means of an electric switch, this movement of the wheels is made to operate automatically at certain speeds.

To explain how this is done the inventor's claims cover over ten pages of



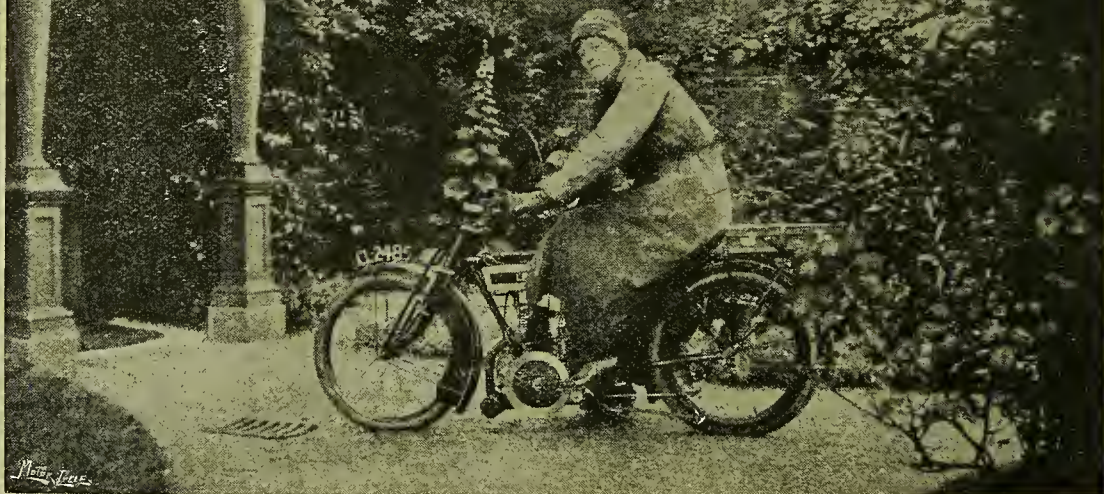
Three of the several drawings in the patent specification which describes the bicar-cum-tricar referred to here.

a patent specification paper, with nearly 7,000 words and upwards of 200 figures. It will be appreciated, therefore, that to attempt a description here is hopeless.

It will be observed that the vehicle is depicted as having a four-cylinder engine, shaft-cum-chain transmission, a rigid frame with a sprung body, wheel steering, etc. The main feature of the design, however, is the folding front wheel arrangement. When used as a bicycle the front wheels are close together, side by side, and approximate to a twin wheel. By electrically-controlled mechanism in the steering head and the back wheel these wheels are made to spread out when the machine drops below

a certain speed and to close up again when that speed is exceeded. Steering a bicycle with a "twin wheel" is a rather uncomfortable thing to contemplate, while the automatic change over probably would be a little nerve-shaking. The illustrations are some of the many given in the patent specification, and include an elevation and plan of the vehicle and a diagram showing the mechanism in the steering head. If any reader requires further information, the number and date of the patent specification is 17,220, July 11th, 1918.

What shall we wear?



THE PROBLEM CONFRONTING THE LADY MOTOR CYCLIST.

"**W**HAT shall I wear?" is popularly alleged to be one of the most absorbing topics to the feminine mind, and to the proud owner of a first motor bicycle it is only second in importance to the question, "What shall I ride?" In this case it is not vanity, for a sensible garb makes all the difference to the lady motor cyclist's comfort.

For myself the matter presented some difficulty; if I had ridden only to please myself I should have had no hesitation in wearing the smart free costume of the land worker and riding triumphantly arrayed in a threequarter coat, knickers, and leggings. But I did not ride to please myself. I rode on business involving the credit and standing of other people (as so many women will now the war is over), and I had to deal with all kinds and classes, from retired colonels to middle-aged ladies with parrots and pug dogs. Somehow, I did not fancy that they would appreciate the land workers' costume.

My thoughts next turned to the fascinating suits that I had seen described in back numbers of *The Motor Cycle* arranged to meet this difficulty by an ingenious device that converted them into knickers when riding and into Bond Street walking skirts when off the machine. I investigated these fairly thoroughly, but finally rejected them because (1) I had a friend who had a friend who was alleged to look a "sight" in one, (2) they were expensive, (3) I saw no reason to believe that they would keep clean in all weathers, and (4) I did not think that

I should be warm enough. Nice as these skirts are, I have never regretted my decision.

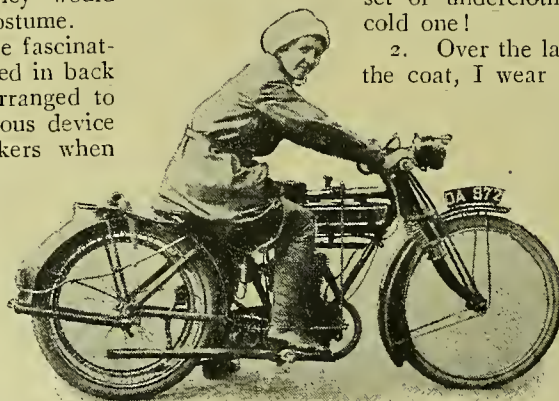
My final choice was as follows, and I commend it to other women riders, who will no doubt despise it as quite unequal to their own.

1. My first layer of clothing consists of the land workers' costume borrowed from a young sister. I should not have bought this, but it has been invaluable, for being mackintoshed it affords protection from wet. It also has capacious pockets that carry my various licences, a large knife, and a small "King Dick" spanner from which I am never parted. It has the further advantage that its colour is inconspicuous, and that when I know I am rid of my censorious world I can cast my outer garments into the sidecar and ride as free as any despatch rider. I might add that underneath the land workers' costume I wear a double set of underclothes. The English climate is a cold one!

2. Over the land workers' knickers, but under the coat, I wear an old blue serge skirt. This

also cost me nothing, as it was destined for a jumble sale until the motor bicycle rescued it. It is a concession to Mrs. Grundy that I bitterly resent, but I have found that my moral courage is not sufficient to enable me to be quite unmoved at the jeers and hoots of small boys when I walk down a village street unaccompanied by the motor bicycle.

3. Over all this I wear an ordinary length mackintosh that cost me £3 10s. When



Breeches and puttees form a serviceable but rather clumsy costume for the lady rider.

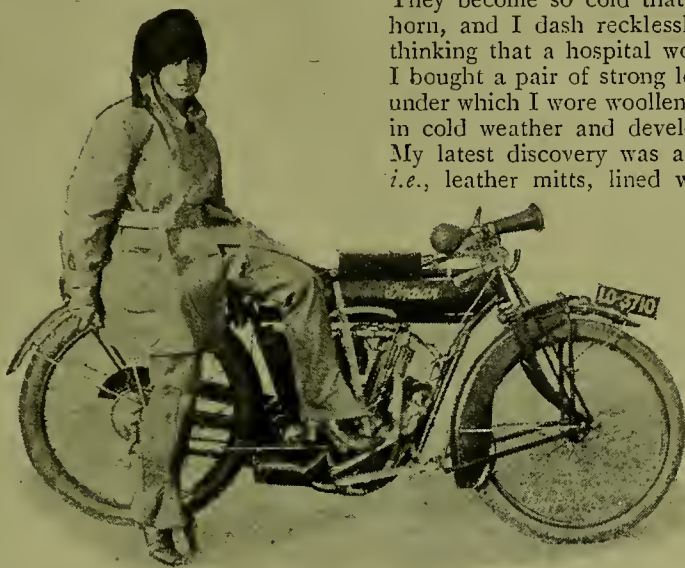
What Shall we Wear?—

first bought it was very fine and looked well, but since I sat in a pool of petrol and knelt in a mixture of tar and oil it no longer does me credit, but at least it bears the marks of its trade and has many years of useful service still left in it. Round my waist I have an ordinary leather strap, stolen from a bicycle carrier. Once I bought myself a fancy plaited leather one—very smart and up-to-date, but the pressure of underclothes burst it apart on my first ride, and it now lies by the wayside unless it has been picked up by some less corpulent rider than myself.

4. On my legs I wear, first, strong golf boots that come half-way up to my knees, and over them either leather gaiters reaching to the knee or long rubber leggings, made by J. B. Brooks and Co., reaching to the thigh; price 16s. 6d. The seller tried to induce me to believe that ladies only needed the shorter leggings, but sad experience in the rain on a push bicycle with a cold pool of water sitting, like a corpse, on my lap had taught me that there is no part of the cyclist that needs more protection than the region above the knee.

5. My head was my greatest difficulty. At first I cherished ambitions that I should be able to look like an ordinary human being when motoring, and bought myself a small close-fitting straw hat and an ordinary veil.

A mixture of dust and rain soon played havoc with this, and I was reduced to various makeshifts. I found that I was quite unable to keep on my head the neat hats that other women wear, though I have never been able to discover the reason for this, so I purchased an old-fashioned motor bonnet, tied with a piece of ribbon under my chin. It never comes off, rain does not hurt it, and it keeps my ears warm, so



The ordinary masculine overalls cannot be said to be a becoming dress for a girl, but some detachable leg covering is desirable when a short coat is worn.

in spite of the somewhat fantastic appearance that it gives me, I cling to it faithfully, though I carry an ordinary hat in the sidecar to meet any crisis that may arise.

6. Protection of the hands is one of the greatest problems, and I have not yet solved it satisfactorily. They become so cold that I am unable to sound the horn, and I dash recklessly through crowded streets, thinking that a hospital would, at any rate, be warm. I bought a pair of strong leather gloves, price 8s. 6d., under which I wore woollen ones, but I suffered agonies in cold weather and developed lamentable chilblains. My latest discovery was a pair of airman's "bags," i.e., leather mitts, lined with lamb's wool, that had

been left on the hosier's hands as being too small for the average aviator. These cost 14s. 6d. Their only fault is that they are short and leave a hiatus between themselves and the sleeve, but this has been met by a pair of woollen wristlets. I can now warm my chilled fingers by curling them inside each other in the mitt, and only my thumb suffers acutely. The mitts are clumsy to use, so I keep them for the coldest

weather. The hand problem is still to be solved.

7. My only other item of clothing is a black silk navy handkerchief—a present—round my neck. During my first really wet ride a cold stream of water trickled slowly and persistently down my neck until it had formed a little lake dammed up by my leather belt, which sent me hurriedly to bed upon arrival at the village inn. Since then I have learnt better.

My total clothes bill, then, stands as follows:—

Mackintosh	...	...	...	£3 10 0
Gloves (8s. 6d. and 14s. 6d.)	...	...	...	1 3 0
Bonnet	...	...	...	13 0
Leggings	...	...	...	16 6
Total	...	...	...	£6 2 6

This does not seem unreasonable for the warmth and comfort afforded.

(Miss) E. M. GARDENER.

THE MOTOR CYCLE AND THE INDUSTRY, AS SEEN BY "THE TIMES."

"THE motor cycle is abominably and unnecessarily noisy," writes an author of an article in last week's *Times* who compared the 4 h.p. 2 cwt. two-wheeler "barking like a dog and arousing a whole neighbourhood" with "40 h.p. and 2 tons weight sweeping past . . . full of stateliness and with little audible effort. . . ."

The writer goes on to show the extraordinary conservatism of the industry in the past, stating that "the two-wheeler . . . is inclined to be the produce of the cycle mechanic rather than the engineer. This state of affairs, however, will rapidly change now that important and powerful firms are taking charge of its interests."

This statement appears to be quite unwarranted, and the reference to important and powerful firms taking charge is erroneous and unfair to the British motor cycle industry.

"No one can pretend," says the writer of the article, "that the motor cycle is half as good as it ought to be. The provision of good suspension, so that it can be ridden fast over bad roads without discomfort, the reduction of weight, so that C₃ can handle it as easily as A₁, quietness of running, simplicity of control, adequate protection against mud and dust—all these might be incorporated . . . without in the least making it any the less a 'sporting' vehicle for the enthusiast."

SPARES AND SERVICE.

Some Remarks on the Supply of Spare Parts in the Past and in the Future.

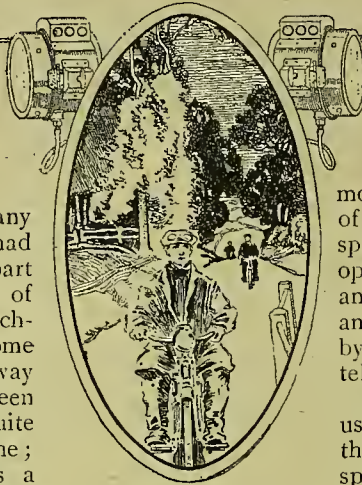
THERE is no motor cyclist of any lengthy experience who has not had trouble in obtaining some spare part for his machine. This is a statement of truth, but it ought not to be. The technical press is always containing some grumble, more or less serious, of the way in which an unhappy reader has been treated in an attempt to get some quite simple part from the makers of his machine; and in a quite recent issue there was a paragraph to the effect that a correspondent had had to wait a whole week before he received any acknowledgment of his letter asking for a simple fitting to be sent to him as soon as possible, as his machine was held up and out of action pending its arrival. When the acknowledgment did arrive it was no more than the usual *pro forma* invoice, which in this particular case told a tale the laggard makers might have wished to deny—namely, that the part *was* in stock, and that the cause of the delay could be no question of difficulty in obtaining material or labour. Why is this, and must it always be so?

Need for Reform.

At the present time we are all prepared to make allowances for prevailing conditions, but really these conditions have not made as much difference as is often alleged, simply because things were so bad before the Hun claimed our undivided attention that they could not become much worse. Complaints on this matter have always been more frequent than on any other, and they cannot all have been due to the unreasonableness of correspondents. Some firms have been conspicuously better than others—not that this need mean a great deal—while some have been quite good, but they both belong to a very small minority, of which the most conspicuous members have always been the Americans. Who ever heard of a serious complaint about an American firm as regards its supply of spares to a stranded rider of one of its products? Of course, the cynic might say that practice has made perfect, and that this is the explanation why the American spare part service has always been so good, but obviously the argument will not hold water. Are English firms always to allow their greatest competitors this pull over them, and are they never to make an effort to retrieve the situation and to regain such markets as they have undeniably lost through this matter alone?

A Very Welcome Innovation.

Fortunately, signs are not wanting that in the motor cycle world the real necessity of some reform in this direction is being recognised. One of the most progressive programmes is that of a new concern in the



Suggestions to Manufacturers regarding Service.

motor cycle field. Rumour has it that one of its strongest selling points is to be its spare parts service. A depot is to be opened in London for the supply of spares, and it is to be kept open night and day, and any spare is to be despatched immediately by passenger train on receipt of a request by telephone or telegram!

Whether rumour is more reliable than usual or not, there is here food for serious thought by the *pro forma* and weekly mail specialists. As to the details of the payment system which these people have in mind I can say nothing, but obviously difficulties of this nature can be overcome, and it would appear that here is an example in which they have been removed entirely. If every other plan failed it might almost be worth while for a firm to put, say, £2 or £3 on to the price of its machine so that the purchaser would have a balance with the firm on which he might draw in case of emergency. Many riders would willingly pay this sum when it was incorporated in the cost of the machine, while they would be reluctant to open a ledger account with the firm by the handing over of the £2 or £3 as a separate sum soon after taking delivery of the machine. And as the sum would be connected in the mind of the firm with the machine of a particular number, there is no reason why the selling of the machine by its first purchaser should not also carry the claim to the deposit to the new owner, who, of course, would be able to draw on it only by means of obtaining spares; and so it would go on until some owner would receive notification that a spare he wanted was barely covered by the deposit standing to the credit of that machine. He could then renew the deposit or allow it to lapse, and the alternative that he chose would provide conclusive proof as to whether the idea was appreciated sufficiently to justify its continuance or not.

Standardisation of Parts.

If for some reason this suggestion were to prove unworkable it does not by any means follow that other simple means could not be found to improve our spare parts and replacements service. It has been suggested that it might pay works to run their spares and even repair departments at a loss, and a little thought should make it clear that the idea is in no way reminiscent of absurdity. Presumably, no section of the Ford factory is run at a loss, but how many Ford cars are sold in the course of a year as the result of the well-known Ford service? Who has not heard a Ford owner say that he would prefer an English car, and would not mind the extra capital outlay if he could only be certain of getting the spares he might require as promptly and *comparatively* as cheaply as he can in the case of the Ford?

Spares and Service.—

Cheapness of parts is a very important factor, but it is not the only one to be considered. Manufacturing methods that have made a pair of motor cycle handle-bars dearer than a new Ford steering column have to go by the board, and they are going—or if they do not the industry as a whole will show them the way—and when those little parts such as brake fittings, engine valves, etc., are so much more cheaply made they will also be more plentiful, and as a result of standardisation less varied in shape and size. So that their distribution will be simplified and easily extended. Thus we may in time become less dependent on the makers for the supply of many minor parts; and which of us has not suffered, at some time

or another, from going into a garage for a small spare for our machine to find that the proprietor has plenty of Jones's but none of Brown's, and, of course, only the latter will fit our particular 'bus? The occurrence of this kind of thing stands every chance of being much lessened in the near future, and it will be to the good of the pastime as a whole when it can be obviated altogether.

Taking things all round there is nothing that the pastime of motoring, and especially of motor cycling, so much requires to widen its popularity enormously as a much improved spare parts service, and it is a more than welcome sign that there are indications that this improvement is on its way to us. May it come quickly and stay long.

RAMA.

MORE NOTES ON SPRING FRAMES.

The Suspension Problem as seen by an Engineer.

BEING a mechanical engineer with considerable motor cycling experience, the articles on spring frames in recent issues of *The Motor Cycle* "gave me to think." I cannot but gather from some of the designs that their originators have scarcely given sufficient attention to what I may term the "incidental mechanical" requirements of a spring frame.

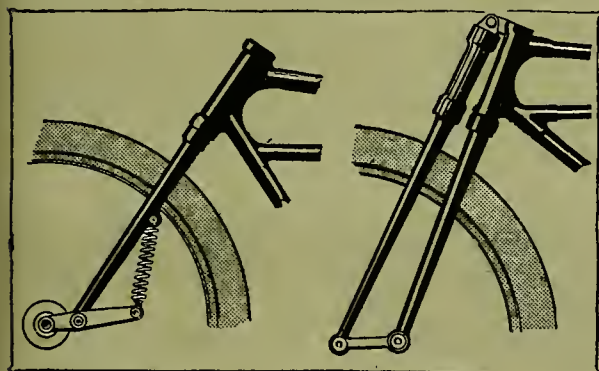


Fig. 1.

Fig. 2.

For the purpose of these notes I will neglect those designs that aim only at the "insulation" of the rider, as I consider that they may be regarded, as it were, steps towards the ultimate goal of fully-sprung machines, useful steps though they may be.

The basic requirement is, of course, the interposition of some form of spring device between the wheels and the main frame of the machine. The incidental requirements from a mechanical point of view may be cited as follows:

- The maintenance of the wheels in the plane of the frame of the machine.
- True triangulation, as far as possible, of the added links and framing.
- Resistance offered to the thrust of the rear wheel in such a way that the oscillations of the wheel take place along an arc, the centre of which is at or near the centre of the driving chain wheel or belt pulley—this in order that the vertical movements of the rear wheel may not vary the tension of the chain or belt.

As an illustration of these points, fig. 1 shows a very old form of front wheel springing, which fails to fulfil

requirements A or B, whereas fig. 2 shows a front wheel springing which fulfils both requirements in addition to forming a simple, pleasing design, easily kept clean, as the spring is enclosed in a telescopic sheath. It would be an improvement were the mud-guard attached to the forward forked member instead of the rear member.

Again, one wonders why the A.S.L. frame construction was not arranged on the lines of example fig. 2, for as the A.S.L. stands it fulfils neither requirement b or c, which the other does.

It is worthy of note that those types incorporating a pivot in the rear horizontal stays in the neighbourhood of the countershaft gear box should have the pivot bearing as long as possible, as the rigidity of the frame in a lateral direction is dependent on this joint; this is particularly the case where leaf springs are introduced under the saddle, as in the Raleigh, A.B.C., Indian, etc., where the additional support given laterally by the down stays is not usually supplied by the method of attachment of the leaf springs.

I imagine that coil springs may have to be of considerably larger diameter or greater length than at present employed if they are to give all the results of leaf springs. With limited space, as in the Brough, N.S.U., etc., I am of the opinion that the introduction of leaf springs as shown in fig. 3 would result in easier riding than would be obtained as at present.

I trust that my citing a German example (the N.S.U., fig. 2), and my criticisms of the other types mentioned, may not incur the displeasure of our designers, to whom all credit is due for trying to provide what is required by riders of present-day motor cycles.

T. SHARRATT, LT.

B.E.F.

Inspector of Ordnance Machinery.

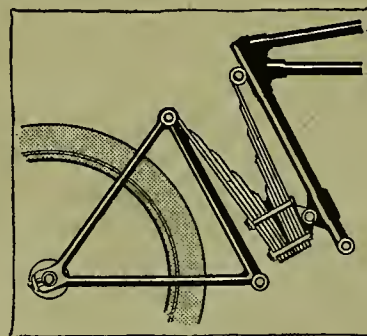


Fig. 3.



SPECIAL FEATURES

WORK FOR THE CLUBS. MODERNISING AN OLD F.N.
WHAT SHALL WE WEAR?

TIME TO LIGHT LAMPS

GREENWICH TIME.

Feb. 6th	...	...	5.26 p.m.
" 8th	...	...	5.28 "
" 10th	...	...	5.32 "
" 12th	...	...	5.36 "

Better Equipment.

There is a tendency among manufacturers to supply their new models with better equipment, such as saddles, tool bags, and tools.

New Index Mark for Middlesex.

In addition to the distinguishing index marks, H, MX, MC, which designate motor vehicles registered in the county of Middlesex, there has been issued to the council the letters MD.

A Famous Track Rider's Post.

We learn that Mr. D. R. O'Donovan, in addition to his duties of supervising the Norton "Brooklands Special" engine department and the Brooklands tests, is head of the experimental engineering department.

French Government Machines.

We hear that the French ex-Army vehicles are receiving approximately the same treatment as are ours at Kempton and elsewhere. The trouble in this case is shortage of labour apparently, as many of the vehicles are lying in trucks and waggons. Whether they would be better off in the sea of liquid mud which prevails in the locality is a moot point.

Motor Cycles in Belgium.

Two of the principal Belgian motor cycle firms, F.N. and Saroléa, are in a bad way, as the Huns have carried away most of the tools and material from the factories. The former factory has suffered particularly severely in this respect. Not only have the machine tools been taken away, but the foundations on which they were built have been absolutely demolished. The only manufacturer who is able to resume the building of motor cycles is M. Gonthier, who has a four-cylinder motor cycle, with which we deal in this issue.

Many private motor cyclists had their machines requisitioned by the enemy, consequently there is a good demand for motor cycles, though Belgian agents for English machines are not in a position to supply, owing to their being unable to secure delivery, but it seems evident that those British firms which are not represented might take steps to become established in that country. They will receive considerable assistance from the Editor of *La Moto*, 1, Rue du Convent, Brussels, Belgium, who will be glad to receive catalogues of new models.

Fifteen Months in Hospital.

We have heard this week from Mr. W. (Billy) Pratt, the well-known competition rider, who, we are sorry to record, is still in hospital, where he has been for fifteen months, after being "knocked out" at Arras. He is looking forward to the time when he will be on the road again. We hope the date is not far distant.

The 8 h.p. British Excelsior.

The specification of the Excelsior sidecar has now been decided upon, and includes 6 or 8 h.p. J.A.P. engine, M-L magneto, B. and B. carburetter, three-speed Sturmey-Archer countershaft gear, totally enclosed all-chain transmission (Hans Renold $\frac{5}{8} \times \frac{3}{4}$ in.), quick detachable interchangeable wheels, made under licence from Lea and Francis, Ltd., provided with Timken roller bearings, Druid Mark II. fork, semi T.T. bars, 25 in. wide, 28 x 3 in. Dunlop heavy-studded tyres, Best and Lloyd drip feed, stands to front and rear wheels. Ground clearance 6 in. The sidecar has an under-slung chassis, with interchangeable wheel and four-point attachment, and coach-built body. The prices are to be £120 for machine only, £150 with sidecar; Lucas dynamo lighting set £25 extra.

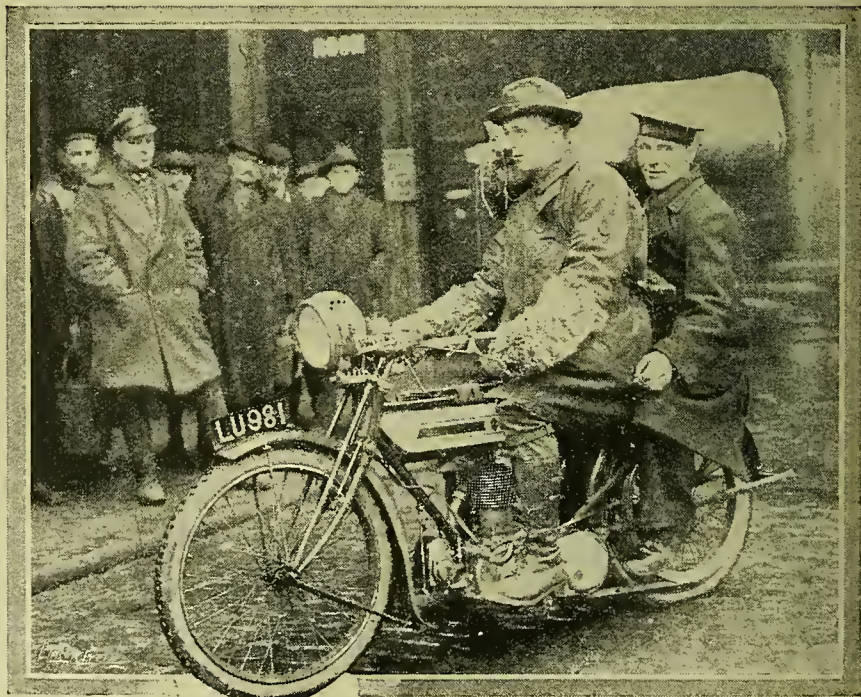
A Radial-engined Cycle Car.

Mr. A. H. R. Fedden, who has for many years been associated with high speed internal combustion engines, has designed a cycle car chassis with a three-cylinder radial engine of 994 c.c. capacity. The vehicle will weigh 6 cwt. complete, and, it is said, should be possible to produce to sell at £160. The bore and stroke are 75 x 75 mm., and the b.h.p. is 16 at 2,000 r.p.m.

Second-hand Prices.

Average prices as advertised in *The Motor Cycle* of January 23rd and 30th:

	Previous to 1914.	1914 and 1915.	1916.	1917 and 1918.
A.J.S., 6 h.p., sidecar	—	£76	£140	£142
B.S.A., 4½ h.p., sidecar	—	£55	£69	£85
Calthorpe, 2½ h.p.	—	£27	£33	—
Douglas, 2½ h.p.	£23	£40	—	—
Enfield, 3 h.p., twin	—	—	£48	—
Indian, 7-9 h.p.	—	£51	—	—
Indian, 7-9 h.p., sidecar	—	£69	£87	—
Matchless, 8 h.p., sidecar ...	—	£98	—	—
Norton, 4 h.p., sidecar	—	—	£84	—
P. & M., 3½ h.p., sidecar	£38	£63	—	—
Premier, 3½ h.p.	—	£36	—	—
Premier, 3½ h.p., sidecar	—	£39	—	—
Rover, 3½ h.p.	—	£37	—	—
Rover, 3½ h.p., sidecar	—	£47	—	—
Rudge, 3½ h.p.	—	£34	—	—
Sunbeam, 3½ h.p.	—	£66	—	—
Triumph, 3½ h.p.	£27	£41	—	—
Zenith, 1 h.p.	—	£40	—	—



DEMILITARISED. The rider of a Triumph countershaft model aiding in the rapid dispersal of the demobilised. The naval man who has just received his papers is evidently no stranger to pillion riding, judging by the weighty kit bag he has to balance.

Running Order?

In last week's issue we noted the following advertisement: Rex $3\frac{1}{2}$ h.p., in running order; less mag.

An Unpuncturable Tyre.

Mr. F. L. Rapson, the inventor of the Rapid jack and other car accessories, has produced an unpuncturable tyre, which appears to have great promise.

Embargo on Imports.

The Autocar states on good authority that the prohibition on foreign motor imports will probably be cancelled soon, but a tariff of 33½% may be retained.

United Action.

Successfully to combat repressive measures concerning taxation, fuel, and roads, a united front must be presented on the behalf of all private motorists. Every motor cyclist should join a motorising organisation, and all such organisations should work together for the common end.

Ixion Models.

The Ixion Motor Manufacturing Co. has now issued its 1919 prices and particulars of its "Peace" models. These include a single gear two-stroke at £42, a similar model with two-speed countershaft gear at £50, a lady's model at £56, and a sidecar at £68 10s. The last-mentioned outfit is more than a two-stroke lightweight with sidecar attached; it is designed throughout as a sidecar outfit for those to whom very high road speeds are not essential. It is fitted with a two-stroke engine having a bore and stroke of 75 and 79 mm. respectively, a Starmey-Archer three-speed gear, with kick starter, and tyres 26×2½ in. The lugs for sidecar connections are not detachable from the motor cycle frame, and to detach the sidecar occupies about three minutes only.

Nuremberg to Coventry in Two Days.

After an absence in Germany and Austria of more than five years, Mr. Basil Vickers-Jones, ex-T.T. and competition rider, has returned to England to re-enter the British motor industry. Before the war Vickers-Jones was with the Premier Co., and the last time he visited England was to demonstrate the company's light car, produced in their German works. Mr. Vickers-Jones completed the journey—a distance of approximately 700 miles—in forty-eight hours.

At the time the war broke out, Vickers-Jones was at the Premier Co.'s Eger (Bohemia) Works, and was interned in a village far removed from the war zones. In fact, he tells us, he did not hear a gun fired until his return to England, and did not see a war aeroplane until two weeks before the armistice was signed.



Mr. Basil Vickers-Jones, ex-T.T. and competition rider, who was interned in Austria during the war.

THE DISPOSAL OF ARMY MOTOR CYCLES.

It is expected that the Government's decision concerning the disposal of war-worn motor cycles will be announced almost immediately.

At two sales in London last week, a further number of machines were sold, and obtained high prices. It is fairly obvious that these sales have some other object than the disposal of surplus Government property, and it is suggested that they are being held merely to "feel the market."

In the meantime, the negotiations with the Association of British Motor and Allied Manufacturers are still proceeding. Taken generally, the "trade" would like to overhaul and repair these machines before they are offered to the public. This does not, however, necessarily mean that makers desire to repurchase machines for resale, but may act as repairers and selling agents for the Government.

Benzole Tax Rumour.

At the time of going to press, there was a report that the Government had decided to impose a tax of 6d. per gallon on benzole if the British benzole producers continue to sell their output, or any portion of it, to the petrol companies.

North Country Coast Road Threatened.

The coast road from Silloth to Maryport is threatened with extinction, by being converted into a track for a light railway.

An All-British Composite Car.

In this week's issue of *The Autocar*, on sale to-morrow, there is a fully illustrated description of a new car produced by Messrs. Angus Sanderson and Co., Ltd. (the parent company controlling the N.U.T. firm), Messrs. E. G. Wrigley and Co., Ltd., and Messrs. J. Tylor and Sons, Ltd. The first year's output is expected to reach nearly 10,000 cars.

Benzole.

The present position of the average benzole producer is that he cannot sell to the motorist on a large scale without the aid of the distributing facilities of the petrol companies. The Government is understood to have recently offered to control and distribute the fuel through the Anglo-Persian Oil Co., a controlled establishment. This offer has been rejected, owing, it is said, to the opposition of several firms who had arranged with the allied petrol companies to use their distribution service.

It is rumoured that the petrol companies have made a very tempting offer to the British benzole producers, and if this is accepted the former concerns will have control of the only competitor to petrol. This will mean that motorists will have to pay for fuel just what the petrol companies like to charge. In other words, the whole fuel supply of Great Britain will be in the hands of a monopoly. Such an unfortunate state of affairs must be avoided at all costs.

A Sale of Surplus Government Motor Cycles.

A sale of Government motor cycles was held at Aldridges, St. Martin's Lane, London, W.C.2, on the afternoon of the 29th ult., and very high prices were obtained, notwithstanding the fact that some of the machines were without saddles, and others looked very much the worse for wear. Five Zenith motor bicycles brought £54 12s., £45 3s., £43 1s., £42, and £37 16s. respectively; five Ridges were sold at prices ranging from £42 to £46 each, while some Sunbeams fetched £59 17s., £58 16s., £51 9s., £43 1s., and £42. The sale was very well attended.

On the following day forty-two Government motor cycles were sold by Messrs. W. and S. Freeman (Aldridges). All except two were Douglasses. The first machine, in very poor condition, went at 29 gns., the average price for the whole being about 26 gns. The machines were not described in detail in the catalogue, and many were in an exceedingly poor state. The highest price paid for a Douglas was 37 gns., and on examination of the machine it was found that the frame was broken just under the steering head.

Somebody got a remarkable bargain in Lot 135. The auctioneer described it as "A Douglas motor cycle, registration L.R. 1905," when someone shouted "It has no engine!" The result was that it was sold for 15½ gns. It transpired, however, afterwards, that it had an engine, and, considering the condition of the other machines put for sale, it was in a very fair state, and was consequently ridiculously cheap.

Two Douglas machines without engines fetched 7½ gns. and 10½ gns. respectively, while a Douglas frame and wheels went for 11½ gns.

Bidding was exceedingly keen for a three-speed countershaft Triumph, the only one of the batch which had been ridden to the place of sale. Bidding started at 30 gns., and the machine was finally sold for 44 gns. The handle-bars were rusted and covered with verdigris.



Despatch riders with the Army of Occupation whilst passing through Liege. Sgt. Haskins (on right) says that the troops have been joyously welcomed, and the inhabitants cannot do enough to express their gratitude. He was at St. Quentin when the Germans came through, and, "although over fifteen stone, failed to stop them."



The Latest Information regarding the Revival of the Various Clubs.

Westmorland M.C.C.

It is expected that this club will be going strong by early summer, though, at present, the majority of the members are in the Services. The hon. secretary, Mr. Joseph Wright, Blackhall, Kendal, is keeping an eye on things, with a view to early resumption of activities.

The Motor Cycling Club.

The annual general meeting of the M.C.C. was held on January 29th. Considering the difficulties of the times, the meeting was well attended.

Col. Jarrott was re-elected president with acclamation, and the following vice-presidents were also re-elected: Messrs. Albert Brown, R. C. Davis, E. B. Dickson, A. J. Jackson, J. Van Hooydonk, and Ernest Perman. Mr. W. H. Wells was re-elected captain. Mr. Southcomb May is carrying on the post of hon. secretary, which he filled so ably prior to the war. Maj. Baddeley, M.C., was re-elected hon. treasurer, and Mr. W. Richards was re-elected auditor.

Mr. Head, the chairman of the committee, suggested the opening run to Brighton on April 5th, the Easter Tour, and mentioned that it was hoped to organise the London-Edinburgh run. A long discussion then followed as to whether or not the club should immediately begin to organise competitions. Some were vigorously in favour of this proposal, while others pointed out the indisputable difficulties in the way of so doing. There is little doubt, however, that the opening run to Brighton will take place, and also the Easter Tour. The urgency of starting competitions soon was put forward by Mr. B. Marions, and Mr. Karlslake spoke strongly in favour of this procedure, urging that it would be desirable to hold a sixty-mile non-stop run from Broadway or Chipping Norton, or some such village, during the Easter Tour.

It was announced that the 1919 committee would consist of the following members: Messrs. Robert Head, H. G. Bell, A. Candler, A. C. Armstrong, P. G. E. James, H. Karlslake, E. Lester, B. Marions, E. M. P. Boileau, C. J. Seed, B. A. Hill, and E. Bridgman.

Mr. G. Pettytt offered a cup to the M.C.C. for a team competition between the Navy, Army, and civilian members.

Wellingborough, Rushden, and District M.C.C.

This club, which had to cease its activities, in common with others, early in the war, owing to the number of enlistments among its membership, will be again placed on a working basis in the early spring. The hon. secretary has already advertised the intention to revive the club, and has asked prospective members and old members to communicate with him at the headquarters, Queen Victoria Hotel, Rushden. It is thought full early yet to call a meeting, as there are yet to be demobilised most of the old members. It would be of great service if those interested in the club would send their names and addresses to the headquarters, so that, when a meeting is decided upon, they could be advised personally. There has been an encouraging response up to now, and a "revival meeting" at an early date may possibly be decided upon.

Newport (Mon.) and District M.C.C.

This club has not yet been restarted, owing to so many of the members being with the Forces. The hon. secretary is Mr. F. W. De La Mare, 88, Church Road, Newport.

The Auto Cycle Union.

It is impossible to make any definite announcement yet as to what official competitions will be decided upon during the present year, but such events will be promoted as will tend to provide data for the trade and the buying public, as, for example, the Tourist Trophy Race and the Six Days Trial. In regard to the former, the question of venue is not one which can be settled by the Union alone, and permission may not be granted to hold the race in the Isle of Man.

Southampton and District M.C.

The committee of the above, having considered the re-starting and reconstruction of the club, has resolved to call a public meeting of all old members and of motorists of the town and district, which will take place at the R.G.A. Drill Hall, St. Mary's Road, Southampton, on Wednesday, February 12th. The chair will be taken at 7.30 p.m. by Mr. Alfred H. Oakley, the president of the club, and it is hoped that everyone locally interested in the motor movement will make an effort to be present. It is desired to extend the usefulness of the club in the future and widen its circle of activities, and with this end in view motorists are asked to bring forward at the meeting any ideas they may have, which will receive the fullest consideration.

Communications should be addressed to the hon. secretary, H. P. Young, Lt., Hants A.S.C., M.T. (V.), Dunelm, 87, Shirley Park Road, Southampton.

Finsbury Park C. and M.C.

At the annual general meeting of this club, the following officials were re-elected: President, Sir Geo.

A. Touche; captain, Mr. C. W. Cooke; financial and general hon. secretary, Mr. J. Evans, 33, Springdale Road, Stoke Newington, N.16.

Leicester and District M.C.C.

The secretary, Mr. Harold Petty, The Old House, Cropstone, near Leicester, informs us that his club has been revived, that there was a general meeting on the 24th ult., which was well attended, and that at the next meeting it is hoped to draw up an attractive programme for 1919.

York County M.C.C.

Mr. W. E. Asquith, the hon. secretary, informs us that it is the committee's intention to reorganise the club with all possible speed. Unfortunately, many of the members are widely scattered, and it will therefore be some time before any definite programme can be arranged. At the outbreak of war, Mr. Asquith was endeavouring to bring about the amalgamation of the Leeds clubs. Doubtless, something in this direction may be decided soon. There are a number of medals awaiting claim by the winners of the 1914 Leeds-to-London Competition. The secretary's address is, 11, Moorland Street, Hyde Park, Leeds.

Club Dates.

MEETINGS.

- Feb. 7th.—The Cyclecar Club Committee, R.A.C., Pall Mall.
- Feb. 13th.—Bolton and Dis. M.C. General, Swan Hotel, Bolton.
- Feb. 14th.—Nottingham and Dis. M.C.C. Committee, Welbeck Hotel, Nottingham.
- Feb. 26th.—York and Dis. M.C.C. General, York Station Hotel.
- March 22nd.—Auto Cycle Union General, Birmingham.

EVENTS.

- April 21st.—Dublin M.C.C., Dunlop Cup Reliability Trial.
- June 9th.—Dublin M.C.C., Whit-Monday Trial.
- June (end of).—Dublin M.C.C., Twenty-four Hours Reliability Trial.
- August 2nd and 3rd.—Dublin M.C.C., Two Days Reliability Trial.

Club News.—

West Grinstead and West Sussex M.C.C.

We are sorry to note that this club is to be abandoned, owing to twenty-five of the original thirty members having given up their lives in their country's service.

East Midland Centre A.C.U.

With a view to forming new clubs in the district, the hon. secretary, Mr. J. Simmonds, 10, Cranmer Street, Nottingham, will be glad to hear from motor cyclists residing in the Newark, Southwell, Mansfield, Worksop, Alfreton, Long Eaton, and Hucknall areas, or smaller places. Mr. Simmonds will be glad to forward a list of established clubs to those interested.

Sheffield and Hallamshire M.C.C.

A meeting of the Sheffield and Hallamshire Motor Cycle Club is being called immediately, and the club should be in full swing by Whitsuntide. The hon. secretary is Mr. Dan Bradbury, 3, Fulmer Road, Sheffield.

Penrith and District M.C.C.

The majority of the members now in the Services are expected to be demobilised soon, when the club will be immediately revived. In the meantime the hon. sec., Mr. S. Barron, 9, Arthur Street, Penrith, will be glad to hear from any of the old, or prospective, members. Mr. Barron has recently been invalided from the R.A.F. in consequence of wounds sustained in an air fight.

MATTERS OF THE MOMENT.

The Political Side of our Reconstruction Problems.

Import Duty on Foreign Motors for Three Years?

THE Motor Industry Branch Committee of the Engineering Trades Committee appointed by the Ministry of Munitions has expressed the opinion that the industry needs to be assisted by an import duty on foreign vehicles and parts for at least three years.

Removal of Import Embargo.

The Autocar learns on good authority that the removal or retention of the total prohibition of motor imports depends largely upon the Government's view upon the effect that such action will have on the labour market. If the sanctioning of the importation of a certain number of foreign vehicles is likely to lead to the easing of the labour market in this country, the probability is that the prohibition will be relaxed in the near future, so that the established concessionaires in Great Britain for foreign machines will be permitted to import, under licence, possibly on payment of an import duty of 33½%.

War-worn Machines.

The Motor Industry Branch Committee report referred to above advocated a scheme under which all Government surplus vehicles are first offered to their original manufacturers for repair and overhaul. "The condition of vehicles so overhauled," the report states, "would be guaranteed by the manufacturers, and this guarantee would materially increase their market value. All vehicles, whether so repaired or not, would ultimately be marketed by the motor manufacturers and their established selling organisations, acting as agents for the Government in the matter."

Legislature.

Lord Balfour of Burleigh's Committee specifically mentioned the motor industry as one of those that has been hampered by ill-advised legislation. The Motor Industry

Branch Committee maintain that all proposals with regard to taxation should be co-ordinated, so that, in the aggregate, the burden cannot become excessive. It is also suggested that the profits of such taxation shall be so applied that the users of the vehicles taxed shall benefit. Restrictive and repressive legislation and taxation cannot fail to check the large expansion of which the industry is capable, and may even jeopardise the position which it has hardly obtained in the engineering world.

Co-operation.

The Autocar suggests that upon nearly all broad principles the interests of makers and users of motor vehicles are in line, and that, given the necessary organisation, united action between motorists and motor manufacturers would be more effective than a number of smaller and independent endeavours to secure the same end. Unity of control has been the great lesson of the war, and is urgently needed in the cause of automobilism. In the Reconstruction programme, important problems directly affecting the interests of motorists and the motor industry require the immediate and serious attention of a single influential body representing the interests of motorists as a whole.

The Proposed Ministry of Ways and Communications.

The proposed Ministry of Ways and Communications, over which Sir Eric Geddes is to preside, needs very careful watching on the part of the motoring organisations. Sir Eric Geddes's interests are with the railways, and there is a danger that our roads may be allowed to share the fate of the canals if they are placed under railway control. The R.A.C. Parliamentary Committee, which has already set to work in good earnest, urges that the Road Board should be strengthened and retained as a separate body outside the Ministry of Ways and Communications.

Readers' Reports of the State of the Roads.

IN response to our paragraph in "Current Chat" of January 23rd, readers have forwarded us the particulars given below regarding the present road conditions in the districts with which they are familiar:

Leeds-Kirkstall-Horsforth-Guiseley road. There is a tram track the whole way, and the condition of the setts in some parts is appalling. An alternative route from Leeds to Otley would be *via* Woodhouse Lane and through Headingley on to the Otley Road. Extensive repairs are proceeding on this latter stretch, and the surface is quite good. From Otley to Harrogate, *via* Pool, the surface is excellent, and large stretches have already been repaired. Harrogate (Gasworks)-Blubberhouses-Bolton Bridge is, as always, in excellent condition.

The road through Guiseley, Burley, and Ilkley is good, but between Ilkley and Addingham it is poor, and improves again between Addingham and Skipton.

The Harrogate-Wetherby road is narrow, but quite good. From Leeds to York motor cyclists are advised to go by Wetherby, the road being excellent the whole way. Tadcaster is to be avoided like the plague. The direct road joining Leeds, Chapeltown, Harewood, and Harrogate is in good order.

Hollings Hill on the Guiseley to Shipley route should be avoided. The bottom stretch is terrible.

The road Apperley Bridge, Rawdon, Yeadon Moor, *via* Pool, to Harrogate is excellent throughout.

Extensive repairs are proceeding on the Otley-Arthington-Harewood stretch. In

all cases, however, Otley itself should be avoided.

The Leeds to Bradford main road, *via* Stanningley, is in very bad condition, but there is, unfortunately, no way of avoiding it.

Readers are warned of the Westerham Road from Keston Pond to Biggin Hill, also the main Sevenoaks Road between Bromley and Farnborough, the condition of which is reported as being "worse than words can describe." The roads between Cobham and Weybridge and between the main Portsmouth Road and Weybridge are in a shockingly bad condition, the worst parts being just outside Brooklands track.

We shall be glad of notification from readers of the state of the roads in their vicinity whether good, bad, or indifferent.

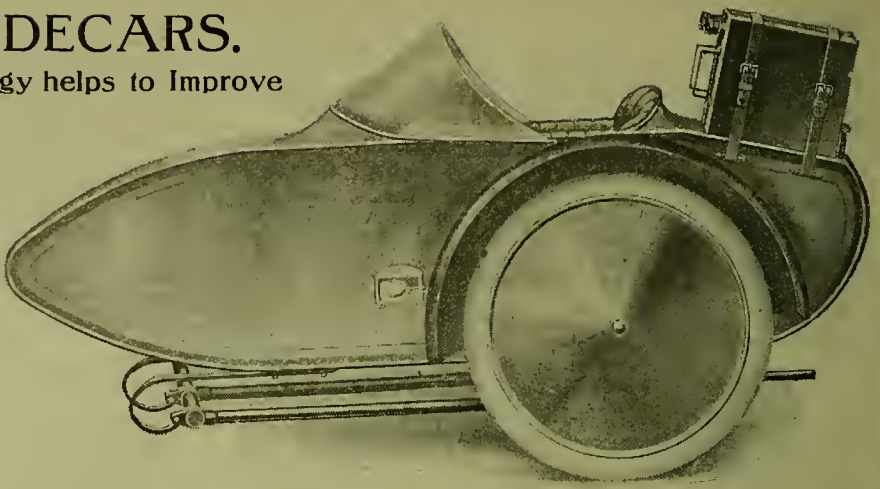
HENDERSON SIDECARS.

War-time Experience in Metallurgy helps to Improve Chassis Construction.

THE latest model Henderson sidecar illustrated on this page has a distinctly pleasing appearance, and one which will appeal strongly to the sporting motor cyclist especially. To obtain this result, however, nothing appears to have been sacrificed in respect of carrying capacity.

We are informed that the question of the most suitable materials for the different parts has been studied very closely, and the makers' experience during the war has made it possible for them to construct, for example, springs of far greater resiliency and toughness than is usual. Such parts as wheel spindles are made of a special alloy steel which is practically unbreakable, while those parts which cannot be enamelled are constructed of the new rustless steel, which, it is said, will not even tarnish.

The connections are by patented adjustable joints of substantial design, as will be seen on reference to the illustration.



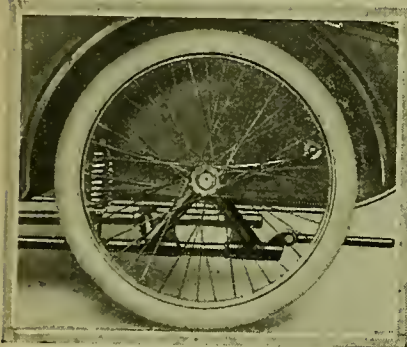
The latest Henderson sidecar. The design is graceful, and great attention has been paid to the streamlining of the body.

The chassis is very stiff, employing only four lugs. Long C springs are fitted at the front, and a combined semi-elliptic and coil tension spring—which acts as a shock absorber—supports the body at the rear. All spring joints are bushed and work on hardened bearings. The wheel is attached to the chassis by a stub axle supported on a stiff triangulated tube assembly. The mudguard is deeply valanced, and is attached to the body, and a substantial stand is fitted. The absence of a luggage grid will be noticed, ample accommodation for spares and impedimenta being provided in the body without cramping the passenger. There is a spacious locker

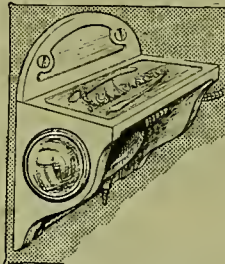
at the rear, upon the rubber covered top of which are fitted a rail and strap eyes for the carrying of two spare tins of petrol.

A novel feature is the incorporating of the sidecar lamp in the cast aluminium step, a sketch of which is given. A good streamline effect has been obtained with a semi-scuttle dash and sloping curved windscreen. A spring seat is included in the equipment, and should do much to obviate fatigue on long journeys.

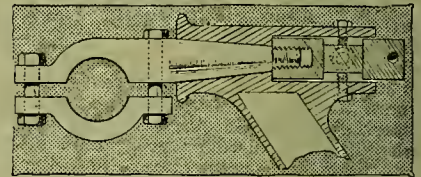
Three other sidecars are to be listed—viz., a touring model, a two-seater, and a "featherweight." It is hoped to commence deliveries of all models immediately.



Showing the body suspension, which is by semi-elliptic and coil springs. Note the sidecar stand.



The sidecar lamp neatly embodied in an aluminium step.



The patented adjustable sidecar connection.

A Windscreen Adjustable to any Sidecar.

WE illustrate here a useful sidecar windscreen, which Messrs. Ollard, Westcombe, and Co., Ltd., Great Charles Street, Birmingham, intend to put on the market shortly.

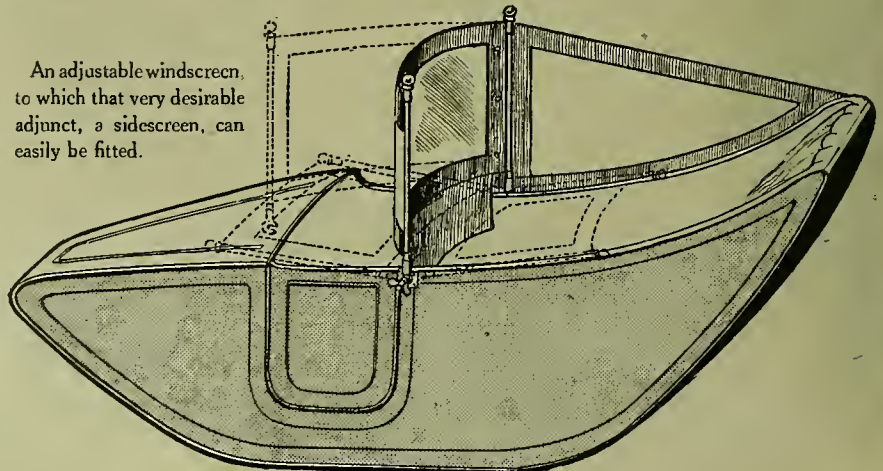
Unsuccessful attempts to purchase a windshield for their own use suggested the possibilities of a demand for a light, inexpensive screen that could be fitted to any sidecar by a novice. The fact that nearly every sidecar is of different width indicated that a flexible windscreen of sufficient length to remain slightly curved, on account of wind pressure, when fitted to the widest sidecar, was necessary.

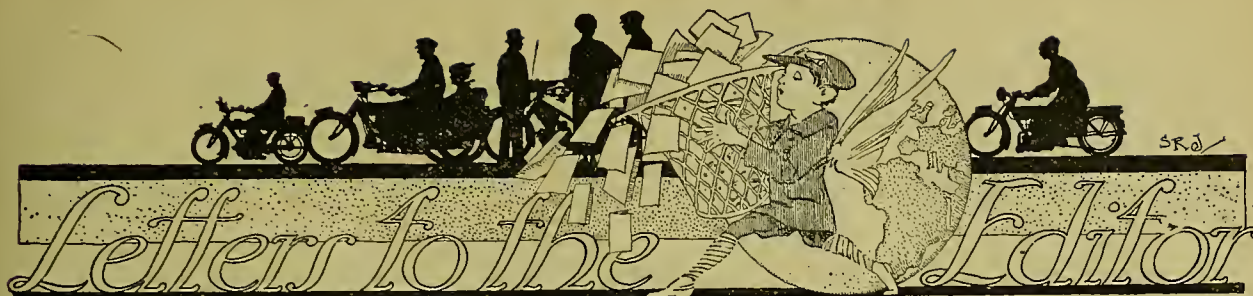
The framework of the screen consists of four pieces of small-gauge spring steel 1 in. wide riveted together, the two horizontal pieces terminating in loops or eyes, through which pass the stout side pillars, which are attached to the sidecar body by means of brackets. These pillars are adjustable to any angle within 180°, and one side is so arranged that the whole can be swivelled round to enable the passenger to enter the sidecar.

The "window" consists of a sheet of xylonite bound with webbing and having leather protectors at the corners. In

addition, it is proposed to fit a side curtain at one side, as shown in the drawing.

An adjustable windscreen, to which that very desirable adjunct, a sidecurtain, can easily be fitted.





The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

PARAFFIN VAPORISER.

Sir,—Referring to the notes by Mr. A. G. Cocks on page 88 of your issue of January 23rd, could you induce Mr. Cocks to let your readers know the name of the vaporiser for paraffin of which he speaks so highly? Or, if it is not a commercial article, perhaps he would be good enough to give a description of it. S.C.P.

MAKERS AND PROMPT SERVICE.

Sir,—In your issue of January 2nd I notice a correspondent complains of the dilatory methods of a certain firm. May I quote my ("other side of the slate") experience when dealing with the Hendee Co.

Having come into possession of an Indian machine, I have had occasion to write this firm several letters re spares, booklets, etc. I have invariably received a reply by return, and when parts have been ordered they have arrived by first post on the day after receipt of my order. In one case, when unable to accommodate me from their usual source of supply, they removed parts required from a stock machine. In the period covered by the above I wrote twice to English houses, and in the first case it took me five days to obtain an answer, while in the second I am still without a reply.

I add the usual disclaimer and enclose my card.

Leeds.

LIEUT.

CARBURETTOR CONTROL.

Sir,—In your issue of January 2nd I notice that a correspondent has raised a question which has puzzled me for a long time, viz.: Why not fit a pedal throttle to a motor cycle carburettor? I am quite aware that a bumpy road would make it harder to manipulate than in a motor car.

To my mind, however, a pedal accelerator fitted in conjunction with the handle-bar slides would be far and away more pleasant to use than those clumsy (to say the least) and very often badly proportioned "levers" which are usually found out of one's reach "somewhere on the handle-bars."

It appears to me to be amazing that no such fitting has been placed on the market as yet.

Why is it that probably ninety-five per cent. of motor car engines are fitted with automatic carburettors, whereas, to my knowledge, not a quarter of this percentage of cycle engines are so fitted?

Is there any difficulty in turning out a small automatic carburettor which is efficient?

R. B. FAIRTHORNE, S.-LIEUT., R.N.

LUBRICATION.

Sir,—As a constant reader of your paper, I should like to reply to Mr. Wright's article on "Lubrication" in the issue of January 16th.

My mount is a 1914 Sunbeam, which as turned out by the makers was fitted with the Best and Lloyd drip feed. This feed I eventually superseded by fitting a mechanically-driven pump of the gear wheel type. It is located on the magneto timing case cover, and driven directly off the large intermediate timing wheel. I have fitted a new oil tank directly underneath the valve timing case, from which the pump draws its oil. From the pump the oil is forced up to an ordinary sight feed, which is adjusted to drip at the required speed into the engine. The pressure of the oil delivered by the pump is regulated by a release valve, so that the oil up to the sight feed is practically always at the one pressure.

As Mr. Wright remarks, "it starts and stops with the engine," and all one needs to do when encountering a hill or hilly country is to turn the drip a notch or two faster. A further improvement would be to have the drip adjustment working in conjunction with the throttle lever.

I might mention that any oil which happens to leak through the pump driving-shaft can only go through the timing case back to the oil tank below. This system has given me every satisfaction over many hundreds of miles, and I think is certainly a step towards perfection as regards motor cycles.

If any further particulars are needed, I shall be pleased to give them. S. HUGHES.

EXPLOSION PRESSURES.

Sir,—I am surprised never to read anything about the power inside the cylinder viz., the explosive mixture of petrol vapour. The power of this must vary with the quality of spirit, and there must be a difference between the power exerted by a vapour of paraffin and a vapour of petrol.

I suppose, really, we are dealing with explosives; and it occurs to me that, with all the experience gained in relation to them the last four years, it should be possible to supply an explosive in liquid form to give us, say, 6 h.p. in a $3\frac{1}{2}$ h.p. engine. With a more powerful fuel we could have lighter machines and smaller expenses and any speed.

The thoughts and experiments of your readers on this matter would be interesting. Calcium carbide generates a very powerful explosive. Has it ever been tried? Edinburgh.

JUNO.

[Acetylene has been tried in motor cycle engines. It gives too powerful an explosion, and has been the cause of accidents. There is not much difference in the explosive force of the various hydrocarbons, though there is a little. Forced induction also has the effect of increasing the power.—Ed.]

THE THREE-JET BINKS CARBURETTOR.

Sir,—In answer to Capt. Lindsay's letter in your issue of the 16th inst., I wish to mention that I have continued my tests for the "dead spot" on Binks carburettors on several engines, both motor car and motor cycle. The results arrived at were in every case the same as I mentioned in *The Motor Cycle* of January 30th.

Regarding your correspondent's idea that a "dead spot" is not so noticeable on a four-cylinder engine, this is quite erroneous, as I have proved it is much more noticeable on a four or six-cylinder engine than on a single or twin.

He will be interested to know that the engines upon which tests were carried out were a $2\frac{1}{2}$ h.p. Sunbeam, $3\frac{1}{2}$ h.p. Triumph, four-cylinder Henderson, Morgan Runabout, Straker-Squire car, 20 h.p. Vauxhall, and six-cylinder Clement-Talbot.

In every case the consumption and power of the engines were very materially increased by fitting a properly tuned Binks carburettor. In the case of the $2\frac{1}{2}$ h.p. Sunbeam, the extraordinary mileage of 170 m.p.g. was obtained on a long run.

It is therefore perfectly obvious that the fault lies not in the carburettor itself but in the incorrect jet setting, which is purely the fault of the rider.

T. D. WHEELER, Lt.,
Instructor in Internal Combustion Engines,
Khaki College, St. Anne's.

WHICH TYPE?

Sir,—First permit me to congratulate *The Motor Cycle* on the success of the "Which Type?" referendum. I have been anxiously waiting (in this dreary and rain-swept part of the globe) for the result, which, I think, ought to be the means of great improvements in the near future.

The manufacturers know now what is in the mind of the motoring fraternity, and it is up to them to materialise on it. Will they?

There was the question of "finish" I should liked to have seen brought more forward. Existing machines have too much nickel about them. Why any at all? All black is quite good, but shows up the mud too much. Let us camouflage the background for it. The Indian red is much better; but why not all khaki, similar to the Indians and H.D.'s with the Americans here, or a grey?

ONE OF THE OLD (MOTORING) GANG.

B.E.F., France.

Sir,—As a believer in the belt drive, it is interesting to read Mr. E. B. Hall's letter in your issue of the 23rd January, commending the use of a 1½ in. belt on an 8 h.p. Matchless twin. The failure of the belt in some cases in the past was not to be wondered at when a 1 in. belt was forced round a 4½ in. pulley, the lack of frictional contact causing the belt to slip, and this the rider endeavoured to remedy by increasing the tightness of the belt.

Treatment of this nature increases the casualties in the transmission, and I have seen belts worn out after covering 500 miles.

Perhaps now, after we have all settled down to post-war business, we shall see the renaissance of the belt-driven cycle car at a very moderate price. My ideal is an 8 h.p. flat twin, variable gear, belt transmission, two 1½ in. belts running over 10 in. and 18 in. diameter pulleys.

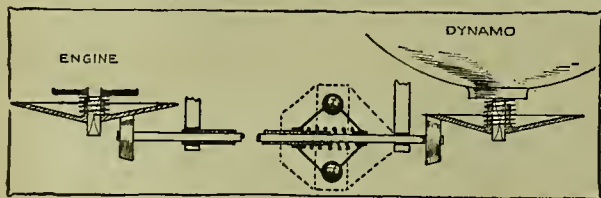
E. OWEN DAVIES.

DYNAMO LIGHTING FOR SOLO MACHINES.

Sir,—In view of the fact that the ideal solo machine specified by your readers is fitted with a dynamo lighting set, I think that the design of a suitable outfit warrants more attention that has so far been given to it. While the outfits supplied for heavy combinations are excellent, they are too large and weighty for use on a medium-weight solo machine.

I have for some time been working on the design of a set suitable for this latter purpose, and hope before long to be in a position to carry out some tests.

I am firmly of the opinion that a constant speed drive to the dynamo (such as Lt. Olechnovich described in your issue of January 9th) is a better method of voltage regulation than the usual magnetic field control for the following reasons: The normal speed of a very small generator, such as that required for a motor cycle, is about 3,000 r.p.m. If it is geared to attain this speed at a road speed of, say, 18 m.p.h., the corresponding speed at 40-50 m.p.h. would be too high



A dynamo speed governor designed by "S.C.C."

to be practical. Consequently, makers have designed their generators to give full volts at about 1,750 r.p.m., and have geared them to attain this speed at not less than 18 m.p.h. in order to keep the maximum speed within limits. This means that the generator is larger and heavier than is necessary for its output, and also that all work below 18 m.p.h. is thrown on the battery. If, however, the speed of the generator is kept constant the normal speed can be reasonably high (say, 2,500 r.p.m.) at a much lower road speed, saving the battery, thus allowing smaller cells to be used, and also reducing the size and weight of the generator.

With regard to Lt. Olechnovich's drive, I independently thought out a similar device, but it seemed to me to be too bulky for use on a motor cycle. My own arrangement is to use a shaft drive as shown diagrammatically in the sketch

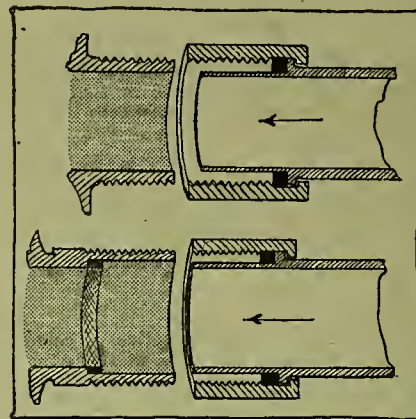
which explains itself. This could be easily enclosed, and is fairly compact. Another and more reliable device would be a V belt drive with two expanding pulleys, coupled together and controlled by a governor on the driver.

My remarks on dynamo speeds and voltage control must not be taken to apply to the larger machines used on cars.

S.C.C., R.A.F.

AIR LEAKS.

Sir,—While reading "Ixion's" "Occasional Comments" in your issue of January 2nd, I was reminded of the



Induction joint mentioned by W.H. Hunter.

number of letters which have appeared in your columns re air leakage in the induction system.

An idea which I intend trying on my bicycle (an old Indian which has the disease badly) might be of some help to those similarly situated.

I purpose fitting new induction pipes, with an extension to fit inside the dome pipe and also to serve to hold an asbestos washer, which should make

a tight joint. Perhaps the sketch will make my meaning clear. If adopted for new engines, the arrangement could be something after the style given in the lower sketch. Two rings or washers could be utilised.

W. H. HUNTER.

VARIABLE IGNITION.

Sir,—Re letter in your issue of 23rd January, signed "H.H.T.," re variable ignition and F.N. engines. This alteration can be made successfully and with decided advantage. I have had experience of it, and should be pleased to take in hand the conversion of your correspondent's machine.

E. O. STAFFORD.

Sir,—In reply to the query of your correspondent "H.H.T.," in your issue of January 23rd, re altering a four-cylinder F.N. to variable ignition, I should strongly advise him not to attempt this, as it requires alterations to the front cover of the magneto, which could only be properly carried out by a very skilled workman, and, even if it were done would not produce any advantage.

The F.N. engine is set to run at maximum advance, which could not be increased even with variable ignition, as it is sufficient for the maximum speed up to which the engine will run—about 4,000 r.p.m. The only variation that could be made is to retard at low speeds, which again is quite unnecessary if the valves and carburettor are in proper order.

As a lover of the F.N., may I reiterate the advice of the makers to let the machine alone, and not to tinker with it for the sake of doing so.

The usual disclaimer.

ERIC CAUDWELL.

ADVANTAGES OF A TWO-STROKE.

Sir,—I should like to add a word of endorsement to "Elterwater's" praise of the two-stroke. I ride an Allon, two-speed, with handle-bar controlled clutch. This machine I have been riding for purposes of military duty since June, 1918, in all weathers, day in and day out. This district (Stafford), and especially the camp, has plenty of hills, but the way the little machine romps up on top is an eye-opener. My work entails constant stopping and restarting, but this does not worry me, as the machine starts easily in the coldest of weather, and with this so-called petrol. The hand-controlled clutch, Brampton front fork springing, and a front brake that works (and is not there simply to comply with the letter of the law) are all refinements found on only the best four-strokes, and I have ridden many single-cylinder machines but never one easier of control in traffic and holding the road better under slippery conditions. The machine runs at slow

speeds without four-stroking, and everything in connection with the engine is very simple. I do not say the speed on the flat is to be compared with a four-stroke, but I would back my machine on, say, side lanes in North Wales, with nasty turns and twists and ups and downs, every time. The usual disclaimer, other than a satisfied owner.

B. A. WYNNE-YORKE, CAPT.

Sir,—I purchased a 2½ h.p. Levis in April, 1916, and, with the exception of about four runs, I have had a coachbuilt sidecar attached the whole time. I am proud to say that I have never had the slightest trouble whatever. I have the Enfield gear fitted (5 to 1 high and 10 to 1 low), all-chain drive, Senspray top feed carburettor (28 jet), E.I.C. magneto, and Lodge aero racing plug. I may say this is the only make of plug on which this machine will run perfectly, as the ordinary two-stroke plugs are of no use whatever.

I have never had any trouble with starting either winter or summer. I use very thin oil at the rate of one pumpful every three miles from a Best and Lloyd drip feed lubricator. The engine receives a quarterly overall, and carbon deposit is very scarce. Four-stroking is unknown, even at walking pace. My petrol consumption is 120 m.p.g. solo and 90 m.p.g. sidecar. The average speed is 35 m.p.h. sidecar and 45 m.p.h. solo, and overheating never occurs. Nothing has been added to this engine to improve the running. I have fitted an iron guard in front of the magneto and under the engine to protect them from mud and loose stones, as the engine is very low. The little engine has never failed on any hill in Derbyshire yet, in spite of having a fully loaded sidecar. I have many times taken three passengers besides myself up the dreaded Sir William, Mam Tor, Cowdale, etc. All such gradients as these make small difference to the wonderful little Levis.

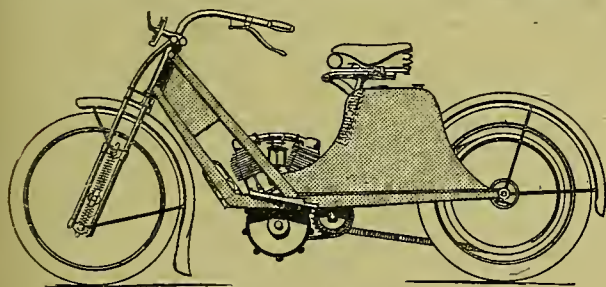
I wonder what "Ixion" thinks about this. He can say what he likes, but there is no two-stroke motor cycle of this class with the same gears that can compare with the Levis. It is simple and easy to handle, and is, in my opinion, the only lightweight that is capable of really hard work. I am just about to overall it for the coming season, and hope to take part in a few reliability trials in the Sheffield district at Easter.

I shall be very pleased to hear from anyone who can improve on this performance with any other two-stroke. I hope that someone will take the matter up and see if we cannot arrange for a good time this year in the way of reliability trials, etc.

F. W. VARNEY.

PRESSED STEEL FRAMES.

Sir,—Your remarks on the above subject are opportune, as no doubt many firms, new to motor cycle manufacture,



A pressed steel frame designed in 1906.

are considering launching out in that direction, and it remains to be seen whether any of these or even the older firms have sufficient interest in steel girder construction to attempt to substitute that method for the tubular frame.

Mr. Barnes's frame is equally fine in appearance as the tubular frame, particularly as applied to the horizontal engine, but it may not appear so neat if applied to the V type engine.

If possible, I would like to ask you to illustrate the pressed frame design which appeared in your issue of September 5th, 1906, and which had second prize in *The Motor Cycle Improvement Competition*. This machine was designed by Mr. G. Pilkington and myself, and embodies all the present-day practice of construction applied to a pressed steel frame, which, no doubt, may be of some interest to your readers.

H. SARGINSON.

LARGER TWO-STROKES.

Sir,—I should much like to see a controversy about a 500 c.c. long stroke two-stroke, air-cooled. This appeals to me intensely as an ideal no-trouble engine. The existing two-strokes, with their light frames, frail forks, tiny tyres, and very low gear, are useless for a hard-riding long-distance man. The Scott does not appeal to me, as it is water-cooled and heavy on petrol and oil.

R. R. RICHARDSON.

AIDS TO STARTING.

Sir,—“Tired Tim’s” letter was distinctly humorous, and I am inclined to sympathise with him in his picture of any manufacturer “padding off” on a motor cycle on a frosty morning with 1919 petrol; but, in mentioning Mr. Bradshaw and the A.B.C., is not “Tired Tim” somewhat off the rails?

I am under the impression the A.B.C. is to be fitted with a kick starter.

WEARY WILLIE.

[A kick-starter will be fitted as an extra, chiefly to sidecar machines.—Ed.]

BENZOLE PRICES.

Sir,—Re your benzole campaign. In an article, “The Motoring Outlook,” *The Yorkshire Post* of January 28th says: “Certain it is that the retail price now charged is 3s. per gallon; and one does not require any special knowledge of the trade to be aware that this is considerably in excess of the price at which it can reasonably be marketed.”

Benzole producers should be made aware of the fact that, if benzole is to be marketed at the same price as high-grade petrol, motorists will turn from it in disgust and choose the petrol.”

Is not 3s. per gallon *shameful*; when I know of a man, connected with a benzole-producing firm, running on benzole at 4d. per gallon now?

H. BROCKLEBANK.

PRICES.

Sir,—I wonder if you could afford me a little of your valuable space to raise a few questions that seem to me perplexing. Why will British motor cycles and sidecars cost us so much in future? Where is upwards of £150 put into a combination? How much will a similar American outfit cost us, considering it has to pay 33½% tariff? Will it cost £200? Americans pay equal wages, if not more, and raw material costs at least equal, if it does cost this figure. How is it done? If I purchase a 1919 machine, and try to sell it in 1920, how shall I stand if the promised changes take place in design? Spring frames, overhead valves, 28×3in. wheels, better silencing, and more all-round efficiency. Have not these things been with us since 1914 on American machines? So, therefore, we shall be then just exactly six years behind our cousins. Perhaps some enlightened reader can oblige me.

PERPLEXED.

Sir,—The correspondence that has passed through *The Motor Cycle* under this heading has indeed been interesting.

I have been anxiously awaiting particulars of a new twin about to be marketed by a firm of repute, makers of a well-known single-cylinder, but after perusing “The Buyers’ Guide,” given in your recent issue, I do not hold out much hope of realising my wish.

Concerning “W.’s” comments in your issue for January 23rd, suggesting that manufacturers be content with a smaller profit, even so, but the increased cost of labour and materials over pre-war days must be recognised.

In my opinion, the prohibitive extra cost as per schedule could be reduced to a satisfactory minimum, provided makers would treat with buyers direct.

SINGLE.

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HINTS AND TIPS FOR MOTOR CYCLISTS.

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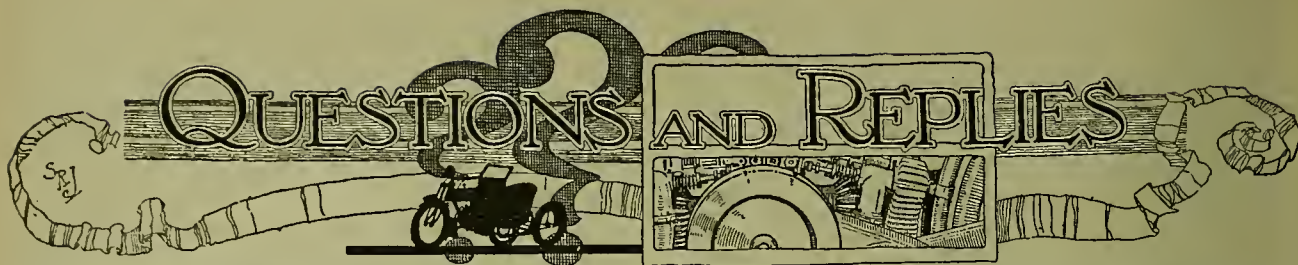
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A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C.4, and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

Magneto Conversion.

? Please inform me if a two-cylinder magneto can be used on a single-cylinder, and if so, would it require altering?—J.C.

You can convert the magneto by removing one of the contact breaker cams.

Lost in Post.

? I sent to a London firm for a motor cycle chain, enclosing cash and postage. I understand the chain was sent by post some time ago, but it has not been delivered, and cannot be found. The firm say I must be the loser, unless I can claim from the Post Office. (1.) Is this right or fair? (2.) Should not the sender claim for loss? If the money I sent the firm had been lost, surely I could not ask them to claim from the Post Office or be the losers?—W.E.A.

As you requested the chain to be sent by post, you would have no claim against the sender, unless you can prove that the sender either had not properly packed the parcel or had not properly addressed it. Of course, if you had stipulated that the parcel had to be insured, you would have been in a better position.

Misrepresentation.

? I paid £40 for a Dene motor cycle and sidecar, stated to be in splendid condition and of 1913 date. When I got it home I found the machine frame broken. I went to the makers to see if they would repair it. They told me they had refused the same job before; that it was a 1911 turnout. I at once wrote and told the seller, and demanded my money back. This he refused. I then told him I should put the case in a solicitor's hands, and he replied that he was prepared to defend the case. On the receipt he does not state it to be a 1913 machine. Will you please tell me what to do? Can I also make a case against him for the machine not being as it was advertised—in splendid condition? I still hold the paper in which it was advertised in splendid condition; and I have never been out on the machine since I bought it, as it is unrideable.—J.H.

You seem to have a good case for damages, provided you have sufficient evidence to support your claim. It would be much the best course for you to place the whole matter in the hands of a solicitor in your district.

Petrol Tank Leakage.

? Recently I found the petrol making its way out around the holes where the four screws which hold the tank to the frame are attached. Knowing it to be an awkward job, I solicit your advice as to the method you would propose to cure it.—J.W.

There are several methods of overcoming this trouble, one being to braze in studs and put the nuts on the outside; another would be to solder in thick brass nuts and red lead the screws before tightening up. We believe Messrs. the Service Co., Ltd., 292-3, High Holborn, London, W.C.1, make a substance for this job called "Coverole."

IMPORTANT NOTICE.

GOODS MADE IN GERMANY.

The proprietors of this journal, being fully in accord with the recommendations agreed upon at the Paris Economic Conference, give notice that they will not permit the advertisements of new goods manufactured in enemy countries to appear in this publication.

ILIFFE & SONS LTD.

Fitting a Sidecar.

? (1.) I am fitting a lightweight sidecar to a Big 4 Norton. The back axle of the sidecar is straight, one end attaching to the chain stay of the machine. Unfortunately, this stay is only just over eleven inches from the ground. Consequently, the axle slopes down from the sidecar wheel to the motor cycle. Is this in any way dangerous or detrimental? (2.) What r.p.m. do you consider best for my engine, both as regards vibration and power? (3.) Do you think a four-point attachment (the sidecar has only three) worth obtaining, in order to make such a sidecar safer with so heavy a machine?—H.W.L.

(1.) It is certainly detrimental to fit the sidecar as suggested, alike as regards tyre wear, strain, and appearance. You could doubtless obtain an adjusting piece from the makers of the sidecar, or have one made. (2.) 1,500 to 1,800 r.p.m. (3.) We do not recommend a rigid fourth attachment on light sidecar chassis with single longitudinal tube. A strap might be used with advantage as a safeguard in case of accidents.

Legal Liability.

? If a hen run into a motor cycle and die, is the cyclist liable for the cost? The owners ask for its value.—M.R.D.D.

In the absence of proved negligence, you would not be liable for damages.

Revenue Tax.

? In January, 1918, I paid tax on a B.S.A. motor cycle, which was used till the end of April. I then bought a lightweight Sparkbrook, and used this, discontinuing the use of the B.S.A. entirely. The B.S.A. has not been used since the Sparkbrook was bought, though both are still in my possession. Am I liable to tax on the two motor cycles? I am under the impression that, as the one motor cycle has not been used since the second was bought, I am not. The Revenue authorities are rather insistent on the payment of the second £1.—A.J.J.

We are afraid you will have to pay the second tax, as the first one was paid on the B.S.A., of which you gave particulars at the time. Unless, therefore, the machine was sold or destroyed, the fact of your having or "keeping" another machine renders you liable to the fresh tax.

RECOMMENDED ROUTES.

BEXLEY HEATH TO NEWBURY.—E.B.

Bexley Heath, Eltham, Nottingham, Bromley, Beckenham, Elmers End, Croydon, Mitcham, Kingston, Raynes Park, Malden, Kingston, Sunbury, Staines, Egham, Ascot, Wokingham, Reading, Theale, Newbury.

NEWPORT (MON.) TO GLASGOW.—J.G.

Newport, Usk, Monmouth, Hereford, Leominster, Ludlow, Craven Arms, Shrewsbury, Whitechurch, Warrington, Wigan, Preston, Lancaster, Kendal, Penrith, Carlisle, Gretna Green, Lockerbie, Beattock, Abington, Uddington, Lesmahagow, Hamilton, Glasgow.

LONDON TO BURTON-ON-TRENT.—J.W.R.

Finchley, Barnet, St. Albans, Redbourn, Dunstable, Fenny Stratford, Stony Stratford, Towcester, Daventry; here you leave the Coventry Road, and follow the signposts to Holyhead along Watling Street until you come to the cross road leading from Nuneaton in the south to Derby in the north, then go through Twycross and Overseal to Burton-on-Trent.

MISCELLANEOUS ADVERTISEMENTS.

PRICES.

ADVERTISEMENTS in these columns—First 12 words or less 2/-, and 2d. for every additional word. Each paragraph is charged separately. Name and address must be counted. Series discounts, conditions, and special terms to regular trade advertisers will be quoted on application.

Postal Orders sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd., and crossed** & Co.

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.4), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge, which must include the words Box 000, c/o "The Motor Cycle." Only the number will appear in the advertisement. All replies should be addressed No. 000, c/o "Motor Cycle," 20, Tudor Street, E.C.4.

DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pays carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged; when under £10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

MOTOR CYCLES FOR SALE.

A.B.C.

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery of the new A.B.C. [2254]

WE Are Now Booking Orders for earliest deliveries of A.B.C. motor cycles. Secure an early delivery by placing your order with us now.—Dunwells' Garage, Wigan. Tel.: 328. [X3219]

A.J.S.

A.J.S.—Immediate delivery of new 1919 6h.p. combination.—Moss, Wem. [X3371]

CROW Bros., Guildford.—A.J.S. Agents since 1912. Write us for your requirements. [9777]

1919 A.J.S. Combinations.—Write Merrick's Stores, 174, Listerhills Rd., Bradford. 'Phone: 2439. [X2430]

A.J.S. 6h.p. Combination. 2-speed, all-chain, perfect, stored during war; £40.—53, Brixton Rd., S.W. [3401]

A.J.S. Combinations.—Book your order now for earliest delivery.—Parker's, Bradshawgate, Bolton. [X3311]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery of the new A.J.S. [2255]

A.J.S. 1914 Coachbuilt Combination, 6h.p., counter-shaft 3-speed, fully equipped; what offers?—Speckler, 1, Gunnersbury Lane, Acton Hill, London, W.3. [3410]



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MATHIS, 1914, 8 h.p., 3-seater, clover leaf **£225**
PHOENIX, 1913, 11.9 h.p., 3-seater, and dickey **—**
STELLITE, 1914, dickey seat **—**
ENFIELD, 1915, dynamo lighting **£265**
G.W.K., 1915, standard, being overhauled **—**
CALCOTT, 1916, dynamo set, standard **£375**
FORD 1914, 4-seater, Stepney, good order **£135**
WOLSELEY, 1912, 12-16 h.p. Landulette **£375**
MORGAN, 1916, 10 h.p., G.P., 4 speeds **—**
MORGAN, 1915 8 h.p. G.P. all on **£145**

SIDECAR COMBINATIONS.

SUNBEAM 1914 Combination, as new **—**
NORTON, 1916, 4 h.p., Norton Sidecar **£100**
SUNBEAM 1914 3½ h.p. Comb., all lamps **—**
P. & M., 1914, 3½ h.p. Sidecar, as new **£60**
ROVER 1918 3½ h.p. Comb., almost new **£100**
HARLEY-DAVIDSON 1917 7-9 h.p. Comb. **£135**

SOLO MACHINES.

LINCOLN-ELK, 1914 2½ h.p., nice order **£20**
SUNBEAM, 1916, 3½ h.p., 3-sp., like new **£95**
DOUGLAS, 1913, 2½ h.p., 2-sp., just overhauled **£36**
DOUGLAS 1914, 2½ h.p., 2-speed, nice order **£36**
RUDGE, 3½ h.p., 1913, fixed gear, very fast **£20**
REGAL, 1914, 2-speed, all accessories **£36**
P. & M., 1914, 3½ h.p., 2-speed, kick-starter **£48**
TRIUMPH, 1908, requires repairs **£25**
RUDGE, 3½ h.p., T.T. model original tyres **£33**
DOUGLAS, 1914, 2½ h.p., 2-sp. **£45**
ENFIELD, 1917, 3 h.p., twin, speedometer **£60**

NOTE.—One or two of these mounts are not at the moment overhauled, and since we are still very short of skilled labour, we are prepared to make a reduction to any clients who might desire to take the machines as they are



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MOTOR CYCLES FOR SALE.

A.J.S.

1916 A.J.S., 4h.p., lamps, horn, speedometer, very good condition; £75.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C.3. [0491]

A.J.S.—For quick deliveries try the sole Leicester-shire agent, Will Chapman, 113, Belgrave Rd., Leicester, the first appointed A.J.S. agent. [3531]

A.J.S.—For the earliest possible deliveries of 1919 models, advance specifications and super service, try the A.J.S. Specialists, The Walsall Garage, Wolverhampton St., Walsall. 'Phone: 444. [X0125]

1917 A.J.S. Standard 6h.p. Black Combination, no lamps fitted, no spare wheel, mileage under 1,000, wrench used on wheel nuts only, spare tube, plug, storm apron, sidecar stand, Lucas horn; accept £95 nett.—Orton, Fair View, Earl Shilton, Leicestershire. [X3156]

6h.p. 1915 A.J.S. Combination, interchangeable wheels all round, spare wheel and tyre, hood, screen, luggage grid, 3 lamps, horn, speedometer, tools, spares, splendid goer, fine appearance; 95 gns.—4, Regent St., Halifax. [3490]

4h.p. A.J.S., interchangeable wheels and coachbuilt sidecar, wind screen, spare wheel complete, electric lighting, new tyres, perfect condition, many spares; any local trial; price £90.—Hands, Burton Walks, Loughborough. [3522]

A.J.S. spares; prompt delivery.—Cyril Williams, Chapel Ash Depot, Wolverhampton [9189]

Alldays.

1916 Allon 2-stroke, 2-speed; £37; exchange combination.—W. Hemmings, 26, Arrow Rd., Bow, E.3. [3272]

ALLON 2-stroke, new 2-speed models, with hand operated clutch; £55; delivery from stock.—Parker's, Bradshawgate, Bolton. [X3316]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery 2-speed and clutch Allons, £58; also De Luxe models, with kick start. £65. [2256]

ALLON, 2½h.p., 2-speed, hand clutch, new June, 1918, little used, well kept, Allon leg shields, oversize back tyre as new, all accessories; only wants seelie; £42.—Captain Yorke, Miford, Stafford. [X3198]

ALLON, 1916, 2-speed, hand clutch, all accessories, £42/10; also 1915 2-speed, all accessories, £36; exchanges arranged.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [3571]

ALLDAYS Matchless, 1914, 3½h.p., T.T. footboards, Bosch, B. and B. lamp set, single speed, good tyres and belt, perfect order; £28; by appointment only.—P. Smith, Burstard Grange, Billericay, Essex. [3403]

Ariel.

ARIEL, 3½h.p., mag., 3 speeds, decompressor; only 33 mos. Wandsworth Motor Exchange, Ebner St., Wandsworth (Town Station). [3461]

RIDER TROWARD and Co., 31, High St., Hampstead.—New 3½h.p. 3-speed Ariel in stock, £80. Orders being booked for earliest delivery 5-6h.p. combination. [2257]

NOV. (1914) Ariel, 5-6h.p., 3-speed countershaft, and coach sidecar, speedometer, spare tyre, Lucas horn, lamps, low mileage, original tyres, first-class condition; price 65 gns.—20, Bridge St., Penistone, near Sheffield. [X3290]

3½h.p. Ariel Combination, 3-speed gear box, clutch, 32 lighting set, mechanical horn, coachbuilt sidecar, underslung frame, with apron; bargain, £55.—After 6 o'clock, 152, Camberwell Grove, Camberwell. [3523]

ARIEL 1916 6h.p. Twin Combination, coach sidecar, all accessories, good tyres, perfect mechanical condition, also appearance; £77/10.—Bromley Motor Works, Mason's Hill, Bromley, Kent. 'Phone: 961 [3557]

4h.p. Ariel, adjustable pulley, m.o.v., new belt, Jess magneto, £8; Grado gear, fits Triumph, 40-1-3in. and 3 1-16in. pistons, gudgeons, 15-1; Triumph free engine wheel, new condition, £4; wanted, Triumph 1912 crank case.—53, Stauway Rd., Coventry. [X3280]

Auto-Wheels.

GENUINE Wall Auto-Wheel, little used, complete; £10.—Murray's, 37a, Charles St., Hatton Garden, Holborn. [X3226]

WALL Auto-Wheel for sale, practically new, Bosch mag., in perfect running order; can be seen any time; bargain, £12.—H. Marcs, Broadway, Tilbury Docks, Essex. [3247]

Bat.

4h.p. Bat, lamp, horn, tools, ready to ride; first £17 secures.—Highfield, Uplands, Stroud, Glos. [3407]

FOR Sale, twin-cyl. 5h.p. Bat-Jap, latest model, nearly new.—84, Earl's Court Rd., Kensington. [3489]

8h.p. 1915 Bat-Jap. 3-speed countershaft, enclosed chain-drive, coach sidecar, £85; exchange lower power.—Any time, 29, St. Leonard's St., Bromley-by-Bow. [3487]

MOTOR CYCLES FOR SALE.

Levis.

RIDER TROWARD and Co., 31, High St., Hampstead.—Levis. Delivery this month. Model E, 2-speed, clutch, £47/10; Popular, £38. Orders being booked in strict rotation. [X268]

LEVIS.—For the earliest possible delivery of 1919 models, advance specifications of all models, sole district agents, The Walsall Garage, Wolverhampton St., Walsall. Phone: 444. [X0127]

Lincoln-Elk.

LINCOLN-ELK. 3½ h.p., 1915, 2-speed, Bosch mag., all fine order; £26.—Batchelor, Clarence St., Kingston. [X420]

Matchless

1919 Victory Matchless. £140; tuition to purchaser. —Ross, 86, High Rd., Lee. [X386]

MATCHLESS. early deliveries.—Sole Agent, J. A. Stacey, 12, Ecclesall Rd., Sheffield. [X1544]

CROW Bros., High St., Guildford, West Surrey agents for the 1919 Matchless. Order now to ensure early delivery. [X1552]

RIDER TROWARD and Co., 31, High St., Hampstead.—Matchless. Earliest delivery Victory model combination, £140. [X2269]

NEW Matchless Combination with spare wheel, in stock; £140.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C.3. [X0492]

MATCHLESS.—Immediate delivery of the new Victory models with spare wheel; exchanges.—Parker's, Bradshawgate, Bolton. [X3514]

MATCHLESS Combination, 1913, J.A.P. engine, 8-10 h.p., 2 speeds, kick start, in splendid condition. —Box L9,024, c/o The Motor Cycle. [X3393]

MATCHLESS, 1915, 8 h.p. M.A.G., Lucas dynamo lighting set, spring wheel sidcar, perfect running order; £115.—Mills, 19, Chalk Farm Rd., N.W.1. [X3243]

MATCHLESS J.A.P. 6 h.p. Twin, sidcar combination, 2-speed, perfect running order, tyres as new, electric lighting; £45.—28, Pendell Rd., near Brockley Station, S.E. [X3448]

MATCHLESS Victory Model Combination actually in stock, with spare wheel and tyre; £140; seen by appointment.—J. Tansell, 1a, Bloomfield Rd., Plumstead, S.E.18. [X1606]

MATCHLESS.—Special contracting agents for post-war Matchless models; earliest deliveries; exchanges and easy payments arranged.—Maudes', 100, Gt. Portland St., London, W.1. [X9920]

MATCHLESS Combinations, two, in stock, M.A.G. engines, good tyres, good appearance, perfect mechanical condition, lamps, speedometer, horn, etc.; £94 each.—Bromley Motor Works, Mason's Hill, Bromley, Kent. Phone: 961. [X3559]

Metro.

METRO TYLER.—Earliest delivery of this sporting lightweight. Free insurance policy at Lloyds for all machines ordered before March 7th.—The Brook Motor and Engineering Co., Withington, Lanes. [X2728]

RIDER TROWARD and Co., 31, 405, and 78, High St., Hampstead, sole agents for the Metro-Tyler 2½ h.p. 2-stroke for London, Middlesex, Essex, Hertfordshire, Surrey, Sussex, Kent, and portions of Berkshire and Buckinghamshire; immediate delivery 2-speed model £52, single-speed £46; demonstration model in stock. Trade enquiries invited and district agencies arranged. [X3601]

Minerva.

MINERVA, 2½ h.p. or 3 h.p., accumulator, B.B. carburettor, running order, slight overhaul, good tyres, 1908 or thereabouts; bargain, £10, or offer.—22, Oak St., Northwich. [X3334]

3½ h.p. Minerva, m.o.v., decompressor, adjustable 32 pulley, perfect order; or exchange for Indian, spring frame (twin), complete, cash adjustment.—Letters only, M. Cain, 8, Upper Bethesda St., Merthyr Tydvil. [X3358]

Monopole.

MONOPOLE 2½ h.p., 2-stroke, 2 speeds, hand clutch, Villiers engine, in absolutely new condition, fine order; £36.—Snowden, 70, Oldham Rd., Ripponden, near Halifax. [X3503]

Motosacoche.

1915 2½ h.p. Motosacoche, variable pulley, F.F., splendid condition, Bosch mag.; £25.—Smith, Plumber, Wivenhoe, Essex. [X3338]

1917 6 h.p. Motosacoche Sidcar Combination, M.A.G. engine, Enfield gears, perfect condition, little used; £80.—Richards, Phoenix Cottage, Leicester. [X3285]

New Hudson.

NEW Hudson, 1914, 3-speed, clutch, and starter, lamps, horn, all in good condition; £38.—65, Shrewsbury Rd., New Southgate, N.11. [X3467]

NEW Hudson, 1914, 6 h.p. twin, 3-speed, clutch, kick starter, not used since 1915, in perfect running condition; £42.—Gay, Eastbrook End, Romford. [X3563]

NEW Hudson Twin, 6 h.p., late 1913, 3-speed Armstrong gear, kick starter, very powerful, excellent condition; £45.—Bell, Selraig, Crail, Fife. [X3111]

NEW Hudson, T.T., 1915, 2½ h.p., 2-stroke, Dixie mag., B. and B., heavy Danlop studded tyres, fine condition, very fast; £21.—Laker, Hollybush, Lyng, Kent. [X3289]



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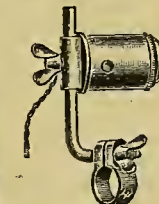
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New Hudson.

NEW Hudson, late 1914, 3½ h.p., 3-speed, clutch, lamps, horn, etc., guaranteed perfect running order; £35.—Lester, 10, Hanway St., Tottenham Court Rd., W. [X2999]

NEW Hudson, 6 h.p. Precision, 3-speed Armstrong hub, lamps, tyres good, engine in good order, gears need slight repairs; offers.—D. Tarabull, Leatham Hill, Cornhill-on-Tweed. [X3293]

4½ h.p. New Hudson Combination, chain-cum-belt, 3 speeds, speedometer, horn, lamps, and generators, kick starter, as new; £58.—Smith, 3, Parade, Staines Rd., Bedfont, Middlesex. [X374]

1913 New Hudson, 2½ h.p. J.A.P., Armstrong 3 speeds, new condition, used only occasionally for short runs, with Watsonian featherweight sidcar; £38, or separate.—H. Smith, Chemist, Clay Cross. [X3310]

New Imperial.

CROW Bros., Guildford.—New Imperial, all models, new and overhauled second-hands stocked. [X778]

RIDER TROWARD and Co., 31, High St., Hampstead.—Immediate delivery New Imperials [X3604]

NEW Imperial.—All models for immediate delivery.—J. A. Stacey, Sole Agent, 12, Ecclesall Rd., Sheffield. [X1545]

NEW Imperials, sole London agents.—2½ h.p. 2-speed 1919 models in stock; trade supplied.—Reys, Easton Rd. [X2973]

LATE 1916 New Imperial-Jap, 2½ h.p., 2-speed, very little used, practically new condition; £36, or offers.—Barrett, Horley, Surrey. [X318]

NEW Imperial Combination, 8 h.p.; immediate delivery; 109 gns.—Exeter Motor Cycle and Light Car Co., Ltd., Bath Rd., Exeter. [X0958]

NEW IMPERIAL J.A.P., 2-speed, 2½ h.p., excellent running order; £30.—Longman Bros., 2, King's Parade, Acton, Tel.: 1578 Chiswick. [X3579]

NEW Imperial Motor Cycles.—2-speed, standard, and lady's models in stock for immediate delivery; no permits required.—P. J. Evans, 91, John Bright St., Birmingham [X0956]

NEW IMPERIAL 1919 8 h.p. Combination, £126, and 2½ h.p. lightweight tourist model, 48 gns.; actually in stock; exchanges arranged.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [X3568]

New Ryder.

2½ h.p. New Ryder-Jap, 1916, Albion 2-speed gear, B. 22 and B. Pilot jet carburettor, in good condition; £30, or nearest offer.—Blackbourn, 35, Queen St., Retford. [X3546]

Norton.

NORTON 1919 Models and prices:

MODEL No. 1, 4 h.p., 3-speed, chain drive; £87.

MODEL No. 7, Brooklands special; £80.

MODEL No. 8, Brooklands road special; £73.

MODEL No. 9, Tourist Trophy; £63.

MODEL No. 16, countershaft, all-chain; £85.

DELIVERIES Commence February. Book your machine now.—Batchelor, Clarence St., Kingston. [X3167]

NORTON, 3½ h.p., T.T., very fast, just overhauled, accessories.—Woodhill, Goffs Hill, Crawley. [X3313]

NORTON.—Early delivery assured by placing your order with Davies, 229, Deansgate, Manchester. [X3337]

NORTON.—Book your orders now for earliest delivery. Exchanges.—Parker's, Bradshawgate, Bolton. [X3319]

1916 Brooklands Norton, with racing sidcar, Phillips pulley, full accessories; £63.—Ross, 86, High Rd., Lee. [X3387]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new Nortons. [X2266]

NORTONS.—Longman Bros., 2, King's Parade, Acton; 17, Bond St., Ealing. Tel.: 1578 Chiswick. Sole district agents. Early deliveries, orders now being booked. [X3581]

NORTONS.—We are now booking orders for the latest model Nortons, solo end sidcar outfits; 25 deposit; deliveries in strictest rotation.—Maudes', 100, Gt. Portland St., London, W.1. [X1442]

NORTON, late 1915, 3½ h.p., T.T. Brooklands Road Special, and low sporting flush-sided torpedo sidcar, long exhaust, variable pulley, accessories, etc., very fast; any trial; bargain, £65, or exchange higher power combination, cash adjustment.—Albert, 1, Church St., Kingston, S.W. [X3445]

N.S.U.

N.S.U. Motor Cycle, 3½ h.p., good condition; £20; very fast.—Carrington, Summerbridge, Harrogate. [X2774]

N.S.U. Combination, 1914, 2 speeds, Millford coach-built sidcar, nearly new, not been used over 2 years, only wants seeing; £48.—43, Paxton Rd., Chiswick. [X2914]

MOTOR CYCLES FOR SALE.

N.U.T.

RIDER TROWARD and Co., 31, 40b, and 78, High St., Hampstead, sole agents for the N.U.T. 3½ h.p. twin 3-speed, dynamo lighting for the whole of London, Middlesex, Essex, Hertfordshire, Surrey, Sussex, Kent, and portions of Buckinghamshire and Berkshire. Orders now being booked for earliest delivery, and district agencies arranged. [3602]

O.K.

RIDER TROWARD and Co., 31, High St., Hampstead.—O.K. Orders being booked for earliest delivery. [2271]

1917 O.K. Lightweight, mag., 2-speed; gift, 35 gns.—Wandsworth Motor Exchange, Ebner St., Wandsworth (Towen Station). [3466]

O.K. Juniors must be booked now if you really want to get there and back every time.—Young's, The Parade, Kilburn, N.W.6. [0967]

1918 O.K. J.A.P. countershaft 2-speed, complete with speedometer, P. and H. lamps, Klaxon, purchased last November for £51, only done 150 miles; reason for selling, bought combination; will sell for £43; perfect condition, and unscratched.—Jackson, Jeweller, Fleet, Hants. [3474]

P. and M

P. and M.—Earliest deliveries. Your name on our list ensures this.—Maitie Mitchell, Ltd., Stafford. [X2921]

P. and M. 2½ h.p., good condition, nice, low machine; £20.—17, Goldhawk Rd., Shepherd's Bush, London. [3365]

Peugeot.

5 h.p. Peugeot, mag. (variable), B. and B. lamps, horn, 2-speed and free engine, with wicker sidecar, complete; £15; exchange.—11, Lorne St., Lytham. [3435]

Precision.

1914 2½ h.p. Precision-Torpedo; £16.—86, High Rd., Lee. [3391]

Premier.

3½ h.p. Premier and Sidecar, 3-speed gear, chain-cum-32 belt drive; £35.—Lucas, Berriew, Montgomeryshire. [X3249]

PREMIER 3½ h.p., Bosch, B. and B. clutch, free engine, as new; £35.—R.B., 42, Hill Rise, Richmond. [X3145]

PREMIER 2½ h.p., £20; owner leaving for Canada; call after 6.—Cpl. Stundeu, 22, Akerman Rd., Brixton. [3398]

PREMIER 3½ h.p., 3-speed, pedal start, like new; £38; coach sidecar, £8.—29, St. Leonard's, Bromley-by-Bow. [3485]

PREMIER 1913, 2½ h.p., in good condition; seen after 7 p.m.; £23, or near offer.—75, Thurlow Park Rd., Dulwich, S.E. [3405]

3½ h.p. Premier, clutch model, unscratched, run few 32 miles only; bargain, £33.—436, Whitehorse Rd., Thornton Heath, S.E. [3417]

PREMIER 1914, 3½ h.p., single speed, semi T.T., new condition; £37/10.—356, Lordship Lane, S.E. Phone: 363 Sydenham [3037]

PREMIER 1914 2½ h.p. Lightweight, Bosch, splendid condition, little used, tools; £22, close offer.—Vaux, 18, Strahan Rd., Bow, E. [3477]

PREMIER 2½ h.p., Danlops, Service belt, lamps, horn, spare valves, enamel, plating, and condition good, little ridden; £16.—Stoddart, 10, Narford Rd., Clapton, London, E.5. [X3184]

1914 7-h.p. Premier Combination, 2-speed gear box, complete with all accessories, completely overhauled, enamelled, and plated, absolutely as a new turnout; a real grand lot, 85 gns.—H. and S., 47, St. Lambeth Rd., Vauxhall. [3585]

Quadrant.

4 h.p. 1914 Quadrant 3-speed Combination, splendid order, canoelet coachbuilt sidecar, smart appearance; £45.—Bradley, 14, Bowles Rd., Old Kent Rd., S.E. [3321]

8-h.p. Quadrant, 1912 or 1913, overhead inlet valves, very little wear in engine, Enfield 2-speed gear and clutch, all-chain drive, Lucas lamp and horn, spare driving chains, tools, re-enamelled, fast solo, or excellent for sidecar; £58.—Box L8,574, c/o The Motor Cycle. [2397]

Rex.

REX 6-h.p. Combination, 2 speeds, handle starting, fine order, electric lighting; bargain, £32/10.—Hall, 63, Highlever Rd., W.10. [3325]

REX 1913 4½ h.p. Combination, 2 speeds, handle starting, new sidecar and tyres; £35, or nearest.—56, Bury St., Lower Edmonton. [3368]

5-h.p. Rex, adjustable pulley, tyres almost new, Bosch mag., guaranteed in running order; first £14.—A. Ross, 113, Mount Pleasant, Merry St., Motherwell, Scotland. [X3167]

REX Late 1913 2-speed Combination, coachbuilt, 650 × 765 (unpunctured), B. and B. automatic, A1 condition, not used since early 1915; £45.—60, Falcon St., Plaistow, E.13. [3406]

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Rex.

REX 6-h.p. 1915 Combination, 2-speed, handle starting, mileage under 1,500, perfect condition throughout; best offer secures same.—Kingdom, Millwood, Umlerleigh, Devoe. [3542]

1913 Rex Combination, 6-h.p., free engine, 2 speeds, handle start, coach sidecar, fast, good condition; seen Saturday or Sunday; £45, or nearest offer.—Thorpe Villa, South Rd., Horsell, Surrey. [3297]

TWIN Rex Motor Cycle, handle starter, mechanical overhead inlet valves, Bosch mag., B. and B. carburettor, Mabon clutch, good belt and tyres, requires retuning; £16.—Fire Station, Gosforth, Northumberland. [X3252]

SALE 3½ h.p. Rex, spring forks, h.b.c., B. and B., new piston, connecting rod, valves, accumulator ignition, new cover on back, £10; also Advance adjustable pulley; 15/-, or exchange.—Smith, 331, Weelsby St., Grimsby. [X3191]

Rex-Jap.

1914 5-h.p. Rex-Jap, 2 speeds, handle starting, new tyres, Bosch, B. and B., large coachbuilt sidecar, 4-point, 3 lamp sets, horn, mirror, all in beautiful condition, done very little; £70.—Lamb, c/o Ripponden Co.-on. near Halifax. [X3302]

Rover.

ROVER, new 3½ h.p. 3-speed countershaft and T.T. models, in stock.—Moss, Wem. [X3375]

ROVER, 1912, free engine, splendid running condition, new Dunlop tyre; offers; spot cash.—Wheeler, Wixford, Alcester. [X3300]

ROVER, 1917, T.T., Philipson, knee-grips, fast lot, just uncrated; £57/10.—51, Maplethorpe Rd., Thornton Heath, S.E. [3492]

ROVER Combination, 3-speed, countershaft, 5-h.p. J.A.P. engine.—Brandish, Triumph Garage, 625, Foleshill Rd., Coventry. [X3367]

1914 3½ h.p. 3-speed Rover, new condition, £38; also 1914 clutch model, Philipson pulley, like new, £36.—86, High Rd., Lee. [3359]

1913-14 3½ h.p. Rover, Armstrong hub, 3-speed, clutch, painted grey; £30, what offers?—Reiffer, 62, Knighton Park, Sydenham. [3502]

1918 Rover 3½ h.p., 3-speed countershaft, not done 100 miles; £80; wanted, Model E. Lewis, new.—Box 2,799, c/o The Motor Cycle. [X3528]

1914 T.T. Rover 3½ h.p., Philipson pulley, very little used, and as good as new, lamps, horn, etc.; very trial; price £45.—Abergele Motor Co., Abergele. [X3146]

ROVER, 1917, 3½ h.p., 3-speed countershaft, kick-starter, beautiful coach sidecar, lamps, special Danlops, new condition throughout; £87.—2, Russell St., Brixton, S.W. [3432]

ROVER 3½ h.p., 3 speeds, clutch, Watford speedometer, watch, mileage under 2,000, condition as new; £50; exchange C.B. combination or lightweight; and cash.—526, High Rd., Leyton, E.10. [3443]

ROVER Combination, 3½ h.p., late 1917, as new, not done 50 miles, 3 speeds, clutch, kick starter, with Rover coachbuilt sidecar; bargain; no permit required.—Holvoet, 8, Loudoun Rd. Mews, N.W.8. [2493]

3½ h.p. Rover, 1914, T.T., clutch model, in top condition, Bosch mag., B.B. carburettor, enamelling and plating good, new cover and belt, lamps, horn, spares; £35; no offers; no dealers.—Apply, 288, Blackhorse Lane, Walthamstow, E.17. [3400]

Royal Prince.

3½ h.p. Royal Prince Motor Cycle; £16.—Partienlars, 312 Bainbridge, Witton, Gilbert, Co. Durham. [X3118]

Royal Ruby.

ROYAL Ruby, 2-stroke; order now for earliest deliveries of 1919 models.—Longman, Fisherton St., Salisbury. [2359]

ROYAL Ruby—Now booking orders for the latest models; deliveries in strictest rotation.—Davies, 229, Deansgate, Manchester. [3336]

ROYAL Ruby—Orders now being booked for earliest delivery; 2-strokes £40, 8-h.p. combination £135.—Rider Troward and Co., 31, High St., Hampstead. [2902]

Rudge.

RUDGE Multi, 3½ h.p., good condition, complete, coachbuilt sidecar.—Write John Morrish, Henleys, Heaham, Essex. [3369]

RIDER TROWARD and Co., 31, High St., Hampstead.—Rudge-Multi, I.O.M. models only. Orders being booked for earliest delivery. [2272]

RUDGE 3½ h.p., clutch, variable gear, new Palmer tyre, Millers head lamp, accessories; 24 gns., or nearest.—Write, Collins, 13a, Glemel Rd., S.W.2. [3356]

RUDGE Multi, 3½ h.p., late 1914, lamps, horn, speedometer, tyre in new condition, and belt; accept £36.—77, Raynton Rd., Enfield Wash, Middlesex. [3262]

RUDGE, clutch model, semi-T.T., 3½ h.p., just been completely overhauled, re-enamelled Harley Davidson grey, disc wheels, fast and sporty, brand new Hutchinsons tyres, tubes, and belt as good as new; only wants seeing; bargain, £35.—Holvoet, 8, Loudoun Rd. Mews, South Hampstead. [2896]

BODIES.

50 Trailer Bodies, wicker and cane; bargain prices, from 7/6 each to clear.—Barbury Sidecar Works, Farm St., Birmingham. [2304]

CANE Sidecar Bodies. Several to clear at 50/- each, worth 25/-; also several juvenile bodies; write for design.—The Willowbrook Co., Leicester. [0901]

BASTONES for Sidecar Bodies.—Several light wicker and coachbuilt bodies; also tandem and torpedo bodies at clearance prices.—228, Pentonville Rd., King's Cross, London, N.1. [2780]

SIDECAR Body Designs for the trade only. Working, coloured, pencil, or line drawings of original designs, also working drawings full sized or to scale.—Cooper's Vehicle Journal, Ltd., established designers to the coach trade for over 80 years. Consult us when designing new ideas.—20, Tudor St., London, E.C.4. [0818]

SIDECAR ATTACHMENTS.

BASTONES for Sidecars at low prices.—228, Pentonville Rd., King's Cross, London, N.1. [2779]

SIDECARS, touring and sporting models to order.—Sidecar Works, 895, Fulham Rd., W.6. [3255]

MONTGOMERY Sidecar, complete with tyre, wicker body, perfect; £3.—"Fernside," Gibbins Rd., Selby Oak. [3330]

COACHBUILT Sidecar for sale, soundly upholstered, as good as new; £10.—L. George, 204, Beeler Rd., Redditch. [X3182]

WATSONIAN C.B. Sidecar, little used; £10/10/-; enamelled green.—19, Wilcox Rd., South Lambeth, London. [3513]

MONTGOMERY Cane Sidecar, quick detachable joints, 26x2 1/4; £6.—Kerr, 3, Strawberry Terrace, Edentown, Carlisle. [3364]

LIGHTWEIGHT Cane Sidecar, good condition, suit Douglas or similar machine; 27.—Grove Mills, Sutton Rd., Mitcham. [3257]

STRONG Coachbuilt Sidecar, suit 3 1/4 or 6 h.p., perfect condition; £10.—Lester, 10, Hanway St., Tottenham Court Rd., W. [3300]

WICKER Sidecar, in perfect condition, complete with couplings; a bargain, £3/10/-; room wanted.—Webster, Jeweller, Bromsgrove. [X3086]

NEW Rally medium weight touring models in stock for immediate delivery.—Rider Troward and Co., 51, High St., Hampstead. [3606]

COACHBUILT Sidecar, very roomy, red, very strong underslung chassis, first-class condition; £9.—Pariser, 90, High St., East Ham. [3409]

CANE Sidecar, quick detachable, good tyre, £5; Millford sidecar chassis, 45/-; stamp, reply.—Hart, 27, Walpole Rd., New Cross, S.E. [3317]

RENNOC Sidecars are manufactured at the Rennoc Motor Sidecar and Engineering Works, 86, Victoria Rd., Stroud Green, London, N.4.

RENNOC Sidecars are designed and manufactured under the personal supervision of Mr. George Conner.

RENNOC Sidecars.—We supply lugs, rims, spokes, upholstery material, tubing, springs, and all fittings for any make sidecar.

RENNOC Sidecar Bodies, hoods, screens, wheel discs, etc., actual manufacturers, wholesale, retail, and export.

RENNOC Sidecars.—We specialise in frame repairs to motor cycle and sidecars.

RENNOC Sidecars.—Special department for sidecar body repairs, repainting, upholstery, lining, etc.

PUGENIX Sidecars.—The Rennoc Co. can supply all spares and undertake repairs for this make.

RENNOC Sidecars.—14 models to fit all motors; tandems a speciality.

RENNOC Sidecars.—We can give immediate delivery of all models.

RENNOC Sidecars to suit Harley, Yale, Indian, Excelsior, Pope, and all American models.

RENNOC Sidecars specialise in motor cycle and sidecar frame repairs, enamelling and plating.

RENNOC Sidecars are actual manufacturers of hoods, screens, and wheel discs.

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RENNOC Sidecars have in stock 17 different design bodies to suit old and new pattern chassis.

RENNOC Sidecars advise you to place your present sidecar with us to be overhauled, we have a special department.

RENNOC Sidecar Works, 86, Victoria Rd., Tollington Park, Stroud Green, London, N.4. [3564]

SIDECARS and Chassis, touring, tradesmen's, and sporting models; good variety; deliveries from stock.—Barbury Sidecar Works, Farm St., Birmingham. [2544]

NEW High-class Underslung Sidecar Chassis, for Harley-Davidson and American Excelsiors, 28x3 wheel, £6/15/-; new wicker body, with apron, 18/-; new coach bodies, £4/15/- and £5/15/-; new medium weight sidecars, to fit any leading English make, on rails in crate, £12/10/-—Halifax Motor Exchange (new address), 18a, Union St. South, Halifax. [3354]

1919 Models

Now in Stock:

LEVIS 2 1/2 h.p. "Popular" 2-stroke Lightweight	£38 0
VELOCE 2 1/2 h.p. 4-stroke, 2-speed	£55 0
JAMES 2 1/2 h.p. 2-stroke 2-speed Lightweight	£54 12
JAMES 4 1/2 h.p. chain-drive 3-speed Combination	£111 15
TRIUMPH 4 h.p., 3-speed, countershaft, W.D. Model ..	£87 0
MONTGOMERY Sidecar Model No. 2, complete	£16 16
MILLFORD Corvette Sidecar, complete	£19 8

THE PREMIER MOTOR COMPANY,

Aston Road, BIRMINGHAM.

Telegrams: "Primus, Birmingham."
Telephone: Central 4310.

Delivery of New Machines

We have the following delivery dates open:	
A.B.C., 3 h.p.	£70 0 May.
A.J.S. 6 h.p. twin Combination ...	136 gns. Mar.
ARIEL, 3 1/2 h.p., 3-speed	£80 0 Feb.
ALLON, 2 1/2 h.p., 2-speed, clutch ..	£55 0 "
2 1/2 h.p., 2-sp., clutch, with k.s. ..	£65 0 "
BLACKBURN, 4 h.p.	£80 0 Mar.
8 h.p.	£100 0 May.
B.S.A., chain-cum-belt	76 gns. Stock.
all-chain	78 gns. Early.
CONNAUGHT MINIATURE, 2-speed ..	£41 3 Stock.
single	£34 0 Early.
" Standard, single	£42 0 "
" 2-speed	£49 15 "
COVENTRY EAGLE, 2-stroke, 2-sp. ..	£54 12 Stock.
DOUGLAS 4 h.p. Combination	£95 0 "
2 1/2 h.p.	£60 0 "
ENFIELD 6 h.p. Combination ...	110 gns. Feb.
8 h.p. Combination	112 gns. "
3 h.p., twin	£69 6 "
2 1/2 h.p., 2-stroke	£52 10 "
JAKES, 4 1/2 h.p.	£89 5 "
3 h.p., twin	£89 5 "
MATCHLESS 3 h.p. Combination ..	£140 0 Early.
LEVIS, 2 1/2 h.p., single	£38 0 Mar.
NEW IMPERIAL, 2 1/2 h.p., 2-speed ..	£50 0 Feb.
" 2 1/2 h.p., 2-sp., k.s.	£58 6 "
" clutch	£58 6 "
8 h.p. Comb.	£125 0 Stock.
NORTON, 3 1/2 h.p.	£87 0 Feb.
3 1/2 h.p., T.T.	£83 0 "
O.K., 2 1/2 h.p.	£48 10 Feb.
P. & M., 3 1/2 h.p. Combination	£102 0 Stock.
ROYAL RUBY, 8 h.p.	£105 0 "
TRIUMPH, 3 1/2 h.p.	£87 0 "

CARS.

A.B.C., delivery May. A.C., May. ENFIELD, early. G.W.K., early. MORGAN, April.

CASH. CREDIT. EXCHANGE.

The Service Company, Ltd.

289-293, HIGH HOLBORN,

LONDON, W.C.1.

Telegrams: Admittedly. Phone: 6430 Holborn.

SIDECAR ATTACHMENTS.

SMART Cane Sidecar, good tyre, valanced mudguard, at any machine, £5; B.B. carburetter, variable jet, 12/6; V.S. frame, tank, spring fork, handle-bar, etc., £1/10.—16, York St., Dover. [3378]

G.K. Sidecar Co.—Phone ns, Holborn 933, for quotation for repairing or renovating your sidecar. Sidecars in stock. Hoods, screens, aprons, etc. Reasonable charges.—336, Gray's Inn Rd., W.C.1. [2207]

SIDE-CARRIERS AND PARCEL-CARS.

LARGE Box Carrier, as new, beautiful shape, all fittings; £10, worth £20.—Walker, Whalley Banks, Blackburn. [3551]

A.J.S. Combination, tradesman's box, 6 h.p., 3-speed, and clutch, electric lamps, good order; bargain, £55.—Warren, 187, St. Alban's Rd., Watford. [3244]

AUTO-CARRIER, commercial, coachbuilt, as new, £45; exchange motor cycle, cash adjustments; seen any time.—Wright, 113, Blair St., Poplar, London. [3500]

CARS FOR SALE.

PERRY Light Car, perfect condition; £140; consider combination part.—37, Arlington Rd., Surbiton. [3469]

STANDARD, 9.5 h.p., special 1914, dickey, dynamo, speedometer, repainted; £255.—Railway Garage, Staines. [3455]

15 h.p. Silent Knight Minerva Landulet, Vanden Plas body, good tyres; £200; high-class piano taken part.—Box 2,778, c/o The Motor Cycle. [X3119]

RAILWAY Garage, Staines—Itala, 100 h.p., £985; Mercedes, 90 h.p., £500; Belsize van, £200; Sunbeam landulet, £360; Carden, 1911, £65; Morgan, 1914, £92/10; Standard, 1914, £255. [3456]

HIGH-POWERED and Sporting Cars.—In stock, 90 h.p. Mercedes, 225 gns.; 60 h.p. Berliet, 325 gns.; 50 h.p. Napier, 295 gns.; 50 h.p. Grognet, 295 gns.; 45 h.p. Mercedes, 325 gns.; 35 h.p. Mercedes, 135 gns.; 50 h.p. F.I.A.T. chassis, 160 gns.; 15.9 h.p. Straker-Squire, 250 gns.; and others; motor cycles or other cars taken in part.—Rider Troward and Co., 31, High St., Hampstead. [2905]

DEMOLIBISATION Bargains! And such bargain!

Remember some of the cars almost new, and all dates advertised here guaranteed accurate.—10 h.p. Unique parcels lorry, modern, light car type, pointed radiators, wire wheels, worth double, £45; 10 h.p. Darracq 2-seater, detachable wire wheels, spare, dickey seat, bargain, £65; 15 h.p. Charron chassis, 4-cyl. monobloc, Solox, worth double, £65; 12-16 h.p. Motobloc chassis, unit engine construction, light, sporty chassis, £75; 14-16 h.p. Darracq traveller's omnibus, smart roomy body, chassis specially reconstructed, 4-cyl. monobloc, Zenith, gate, worth double, £80; 15.9 h.p. 1914 R.C.H. torpedo, monobloc, enclosed valves, detachables, centre gate, nice little 4-seater, £90; 12-15 h.p. Star 2-seater, gate, Zenith, £90; 30 h.p. National (U.S.A.), sporting 4-seater, fast car, £100; 58 h.p. Daimler chassis, £100; 2-ton Berliet chassis, twin solids, all gears new, wants slight adjustments, worth triple, to clear £100; Thames bungalow plot at Sunbury, £100 freehold; 8-10 h.p. Renault platform lorry, 8ft. x 5 1/2 ft., most economical, £115; 15 h.p. Bayard 1-ton van, twin solids, roomy body, £115; 15-20 h.p. Panhard live axle chassis, £120; 8-10 h.p. 1914 sports model Humber streamline 2-seater, disc wheels, 40 m.p.g., £120; 40 h.p. 6-cyl. Acme (U.S.A.) sporting 4-seater, special competition car, real snip, £125; 12-15 h.p. F.I.A.T. taxi-landulet, monobloc engine, economical running, wire car, £125; 12-14 h.p. Renault landulet, £130; 10-12 h.p. Le Gni semi-sporting 2-seater, 4-cyl. engine, Zenith, £135; 18 h.p. 1915 Maxwell streamline 4-seater, monobloc, enclosed valves, centre gate, Bosch mag., £135; 2-ton Milnes-Daimler heavy commercial, twin solids, live axle, Zenith, H.T. mag., £145; 10 h.p. A.C. light car, streamline 2-seater, 4-cyl. monobloc, enclosed valves, pointed radiator, wire wheels, domed mudguards, £185; 3-ton Straker-Squire lorry, cab front, H.T. mag.; Zenith, all new tyres, aluminium radiator, twin solids, bargain, £235; 1914 Palladium 1-ton van, solids all round, monobloc engine, enclosed valves, £245; 16-20 h.p. Sunbeam chassis, enclosed valves, detachable wheels, 4-speed, Clandel, £250; 40 h.p. Wolseley chassis, enclosed valves, detachable wire wheels, extra long wheelbase, price overhauled £250; 20 h.p. Crossley torpedo, monobloc unit construction, detachable wheels, Zenith, £265; 15.9 h.p. 1914 B.S.A. 2-seater, Knight engine, worm drive, detachable wheels, £285; 3-ton De Dion commercial chassis, latest round radiator type, worm drive, enclosed valves, twin solids, steel wheels, £350; another exactly similar, better condition, £385; ditto 3-ton De Dion lorry, complete, roomy body, high sides, £425; 2-ton Napier W.D. type lorry, worm drive, aluminium radiator, enclosed valves, steel wheels, twin solids, bargain, £575; 4-ton late 1915 Carner lorry, cab front, enclosed valves, twin solids, very little used indeed, real bargain, £650; 24-30 h.p. 6-cyl. Wolseley limousine-landulet, enclosed valves, extra long wheelbase, detachable wire wheels, £650.—Cox (below).

DOUGLAS S. COX, the absolutely straight motor man, 6a, Lansdowne Hill, West Norwood, S.E., has all the above actually in stock and on view. Please call. Hours 8 to 6.30, including Saturdays; no business Sundays. Established 1902. [2248]

RUNABOUTS AND CYCLE CARS.

DUO 2-seated Cycle Car, 8 h.p. J.A.P., hood, screen, lamps, perfect, late model; £85.—230, Brixton Rd., S.W.9. [3472]

RUNABOUTS AND CYCLE CARS.

CARDEN, 1915, 5-6h.p., 2 speeds, aero screen, painted red; £65.—Railway Garage, Staines. [3453]
MORGAN, 1914, J.A.P., hood, screen, speedometer, just repainted; £92/10.—Railway Garage, Staines. [3454]

CROMPTON, 1914, 6-8h.p. J.A.P., torpedo shape, 2-speed; £48, or offer.—Cuss, 20, Canning Crescent, Wood Green, London. [3468]

1916 G.P. Morgan, 10h.p. w.c. M.A.G., excellent condition throughout, electric lamps; £160.—Lt. Chase, Churtham, Canterbury. [3246]

MORGAN 1915 Grand Prix, water-cooled, overhead valves, perfect condition; any trial; £135.—Parker's, Bradshawgate, Bolton. [X3320]

A.C. Sociable, 1914, unused 2 years, good running order, hood, screen, lamps, good tyres; £47.—16, Church Lane, Leytonstone, E.11. [3304]

1915 G.N. 3-speed, spare wheel, hood, screen, fully equipped, perfect order; 135 gns.—Rider Troward and Co., 31, High St., Hampstead. [3607]

A.C. Sociable, 2-speed, hood, screen, side curtains, brass head lamps, tyres excellent, machine in perfect condition; £45, or near offer.—P. Walker, 13, Promenade, Mill Hill, N.W.7. [3333]

MORGAN, 1915, Grand Prix, 10h.p. overhead w.c. J.A.P., fish-tail body, electric lamps, horn, screen, exceptionally fast, just repainted; £164.—Bromley Motor Works, Mason's Hill, Bromley, Kent. Phone: 961. [3561]

MOTORETTE (1913), by Premier Motor Co., Birmingham, 2-seater, 3 wire wheels, single-cyl., w.c., 2 speeds, hood, screen, tools, lamps; price £50, rock bottom; built for a lady of title; this little runabout is in excellent order, had only 18 months' wear.—Keen, Bond St., Leominster, Herefordshire. [X3112]

COMMERCIAL VEHICLES.

4, 3, and 2-ton Lorries, dozen absolute bargains, £100 to £650. See long advertisement under Miscellaneous Cns.—Cox, West Norwood. [2249]

FOR Sale, 20h.p. Austin touring car, converted to lorry, 30-cwt. loads, pneumatics, engine in exceptionally good condition; price £90.—Apply, Daniel Doncaster and Sons, Ltd., Forge Department, Sheffield. [3270]

MAXWELL 4-cyl. Commercial Van for sale, £130 lowest; a really fine van, and a great bargain; suit tradesman, or for any general carrier work; in perfect running order, and van as new.—Address, Binstry House, Burton Joyce, Notts. [X3229]

ENGINES.

1912 4h.p. Rex Engine, long exhaust pipe and, magnet chain case, in perfect running order; £5/10, or offers.—H. Potts, 22, Lansdowne Rd., West Hartlepool. [3359]

8h.p. Minerva, m.o.v., B. and B. carburettor, Bosch mag., variable pulley, plate clutch, induction and exhaust pipes; £30.—Potter, 14, Bridge St., Bishop's Stortford. [X2439]

32h.p. Minerva, m.o.v., Bosch mag., B. and B. carburettor, 25; 8h.p. De Dion, latest enclosed magnet, B. and B. carburettor, fine boat engine, £13.—"Ferndale," Gibbins Rd., Selly Oak. [3329]

IGNITION APPLIANCES.

SPECIAL Lightweight Magneto; £3/15.—Service Co., 292, High Holborn, London, W.C.1. [3234]

BASTONES' for Magneto Repairs; all work guaranteed; prices right.

BASTONES'—We have a few Bosch and Dixie twin magnetos in stock.—228, Pentonville Rd., King's Cross, London, N. [3232]

BOSCH, off 3½h.p. Triumph, wants attention; 37/6, or nearest.—Douglas, Bushtown, Coleraine. [X3299]

BOSCH Lightweight, ZATR, 1914, anti-clock; £4.—Knight, 27, Nadine St., S.E.7. [3480]

LIGHTWEIGHT Anti-clock Magneto, Bosch, Eisenmann, perfect; £3/15 each.—Ashton, Thornhill Edge, Dewsbury. [X3180]

TWIN Car Magneto (Thomson-Bennett), perfect condition, waterproof, new, never used; £6/10, bargain.—The Beeches, Taworth Lane, Earlswood Lakes. [X3245]

BRAND New Thomson-Bennett Magneto, twin, watertight, £5/5; 1914 Senspray carburettor, £1/5, or £6 the two.—Taylor, 5, Gladstone Place, Sandy Lane, Camp Hill, Birmingham. [X3247]

JEERON, registered 291.298, greatly superior to platinum, unequalled for blades, screws, etc.; cures misfiring; 5/- each rivet; Jeeron screws, fit Bosch magnetos, 11/- pair; old screws Jeeronised, 5/- each.

JEERON Contacts, used by Messrs. Collier Bros., Colver, Martin, making world's records.—Jeeron, 38, Herbert Rd., Woolwich, London, S.E.18. [X3331]

FOR Magneto Repairs, spares, re-magnetising, British magnetos and dynamo lighting equipments, write or phone Streatham 2108. Established 1900.—Love-land Bros., Crescent Magneto Works, Norbury, London S.W. [8078]

MAGNETO Repairs—Send your magneto to Palmer's Garage, Tooting. Reply paid; quotation telegraphed on receipt. Quick, efficient repair guaranteed in from 2 to 6 days, usually within 24 hours.—Palmer's Garage, Tooting. [9980]

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IGNITION APPLIANCES.

CHARLES PARKER and Co., Magneto Specialists, undertake to repair and despatch any and every magneto received by them in 24 hours, and guarantee their job for 12 months.—Below.

CHARLES PARKER and Co. have a special department for motor cycle magneto repairs, and assure you of instant attention.—Below.

CHARLES PARKER and Co. are making a special feature of speed in completing their transactions.—Below.

CHARLES PARKER and Co. always have a reserve force of mechanics awaiting that urgent job.—Below.

CHARLES PARKER and Co., Magneto Specialists, 75, Park Rd. North, Acton, London, W.3. Tel.: Chiswick 1518. [2099]

BIRMINGHAM—Magneto repairs, rewinding, re-magnetising, and overhauling promptly executed; moderate charges.—The Electrical Trades Supply Ltd., 41, Gt. Charles St., Birmingham, T.A.; Motors, Birmingham. Tel.: No. 1601 Central. [1721]

THE Magneto Repairing and Winding Co., Established 1912, Manager S. T. Boon, late from the Bosch works.—Magneto repairs of every description. All repairs at lowest possible prices, and strictly guaranteed. We can mostly return them within 24 hours. We have several new and second-hand single and 2-cyl. magnetos in stock, all guaranteed.—The Magneto Repairing and Winding Co., 158, Seymour St., Euston, N.W.1. Phone: Museum 1158. T.A.: Kamagnelic, Northwest, London. [1032]

TYRES.

ECONOMIC Tyre Co.—Please note new address, 314, New Cross Rd., New Cross, S.E.14.

ECONOMIC—We have the following clearance lines in Kempshall and other well-known makes; goods carriage paid on approval against remittance.

ECONOMIC—24x2½ heavy non-skid, for 2-strokes, 32/6, listed 45/6; complete with tube, £39/.

ECONOMIC—26x2½ wired-on fluted covers, 7/6, pair 12/6; only a few left.

ECONOMIC—26x2½ extra heavy non-skid for 2½ in. rims 41/-, listed 60/3.

ECONOMIC—26x2½ diamond studded, 41/6; non-skids, 35/-; 650x65 diamond studded, 46/3.

ECONOMIC—650x65 extra heavy non-skids, 45/-, listed 65/-; 28x3 extra heavy, 50/-, listed 69/9.

ECONOMIC—26x3 Kempshall non-skid, 75/-, listed 96/-; 26x3 anti-skid, 45/-, listed 72/6.

ECONOMIC—Guaranteed tubes, 24x2½ 7/6, 26x2½ 7/6, 26x2½ 8/6, 26x2½ 8/6, 26x3 11/6, 28x3 11/6.

ECONOMIC Tyre Co., 314, New Cross Rd., New Cross, S.E.14. Phone: New Cross 1393. [2826]

BASTONE'S for Covers and Tubes.—New clearance line, as below. Goods sent on approval against remittance.

BASTONE'S—26x2 Michelin light, 12/-, list 17/-; steel-studded, 24/-, list 43/-.

BASTONE'S—26x2½ Michelin Trident, 22/-, list 32/6; Hutchinson Brooklands, 18/-, list 29/5; Tourist Trophy, 25/-, list 41/-; De Laxe heavy, 32/-, list 45/6; Kempshall, 19/6.

BASTONE'S—26x2½ Michelin heavy Trident, 26/-, list 35/9; De Laxe heavy, 35/-, list 51/3; Goodrich safety tread heavy 45/-, list 57/6; Shell grooved, 18/6 list 36/-.

BASTONE'S—650x65 Henley plain, 35/-, list 53/3.

BASTONE'S—28x3 rubber-studded, suitable for front wheel and sidecars, 32/6.

BASTONE'S—Wired edge covers: 26x2½ heavy Trident, 19/6, list 32/3; 26x2½ Michelin light, 12/6, list 18/6.

BASTONE'S—Special line of Michelin push-cycle covers, 28x1½, 28x1¾, 26x1½, 26x1¾, 6/9, list 9/-.

BASTONE'S—Hutchinson tubes, 26x2 5/6, 26x2½ 6/-, 26x2½ 6/6, 28x3 9/6, batted 1/6 extra.

BASTONE'S for Belts, Pedley and John Bull, all sizes in stock.

BASTONE'S, 228, Pentonville Rd., King's Cross, London, N.1. Tel.: 2481 North. Telegrams: Bastone's, Kinross, London. [2778]

AVON Steel-studded Tyre, 700x75, almost new; 27/6.—Price, 292, High St., Lewisham. [3312]

TYRES—See Bancroftian Advertisement under Miscellaneous. Stelistic, Pedley, Kempshall, Hutchinson; extraordinary prices. [0845]

NEW Heavy Beaded Covers, 26x2 16/-, 26x2½ 25/-, 26x2½ 27/6; butt-ended tubes, 26x2½ 8/6, 26x2½ 9/-; endless tubes, 26x2½ 7/6, 26x2½ 8/-; sent approval carriage paid receipt remittance.—Palmer's Garage, Tooting. [9191]

MY Prices Astonish All Competitors—Brand new tyres; 26x2 very heavy Beldam Bulldog cover (50/-), accept 30/-; ditto, 26x2½, 35/-; 26x2½ Beldam de Laxe cover, 26/-; Hutchinson heavy rubber studded, 25/-, extra heavy 30/-; Skew ditto, 21/-, heavy pattern 25/-; 26x2½ 16/-, steel 18/-, heavy 21/-, extra heavy 25/- and 30/-; secure at once.—Millards, Chesterfield. Established 1900. [X3152]

TANKS.

TANKS.—Tanks any shape to order, repairs or enamel: disc for motor wheels; general sheet metal work: lists free.—Attwoods, 86, Rosebery Av., E.C. Tel.: Central 12445. [2922]

PATENT AGENTS.

INVENTORS' Advice and Handbook Free.—King's Patent Agency, Ltd., 186, Queen Victoria St., London. [5818]

INSURANCE.

FOR Insurance of all kinds (specially motor), applv. Ernest J. Bass, Insurance Broker, Bishops Stortford. [0693]

DREADNOUGHT Motor Cycle Policies at Lloyd's Premiums from £1/7/6, payable yearly, quarterly, or monthly. Before insuring elsewhere, write for prospectus.—Roys, Ltd., 199, Piccadilly, London [7734]

TUITION.

MOTOR Tuition—The British School of Motoring, Ltd., gives the highest standard of training in driving, mechanism, and repairs for the lowest fees in England. Call, or write for full particulars.—The British School of Motoring, 6, Coventry St., Piccadilly Circus, W. [0953]

AGENCIES.

AGENCIES Wanted for motor cycles and accessories.—Central Motor Cycle Garage, 39, Bedford St., North Shields. [3283]

DUTCH Firm, many years in the cycle, motor cycle, and rubber tyres and tubes branch, seeks sole representation for Holland.—Address, No. 6,017, Seyffards Central Advertisement Bureau, Damrak 99, Amsterdam. [3278]

DENMARK—An old, well reputed firm in the motor line, with address in Copenhagen, wants to take over the sole agency of a first-class English motor cycle.—Applicants are requested to apply to 7,008, Sylvesters Hvid, Copenhagen K. [3236]

TO Manufacturers—Manufacturer's agent, and buying agent for important firms in the East (now visiting India), wishes to get into touch with manufacturers of light cars, cycles, accessories, and especially novelties, with view to business in the East.—Box 2,662, c/o The Motor Cycle. [X1997]

GENTLEMAN with first-class connection, residing in Brussels (Belgian subject who speaks English), desires to represent in Belgium English manufacturers of cycles, motor cycles, accessories and tyres: 20 years' experience of the trade.—A. Watelet, temporary address 12, Dudley St., Luton. [2066]

CONSULTING ENGINEERS.

SPECIALIST in Aviation Engines, proposing production of high speed motor cycles at moderate price, desires communication with prospective clients.—Box L9,036, c/o The Motor Cycle. [3546]

A. WRIGHT, 20 years' experience, many years tester and representative for well-known firm of light car and motor cycle manufacturers, gives unbiased opinion.—154, Gt. Portland St., W. [3214]

F. G. HERRTAGE, 10 years' practical experience, offers unbiased advice on the purchase of new and second-hand motor cycle: machines examined and reported on: distance no object.—48, Clarendon Rd., Putney, S.W.15 [2693]

COLE and Clease, 24, Union St., Birmingham, advise on the purchase, insurance, garage, installation, and maintenance of your machine, new or second-hand. Expert examination undertaken: advice on agricultural, country house lighting, etc. [X2438]

REX G. MUNDY, after 12 years' all-round experience, offers unbiased expert advice in the selection of new and second-hand motor cycle and light cars, examination and reports; vehicles bought and sold on commission; insurance.—Room 80, 83, Pall Mall, London, S.W. [3544]

SITUATIONS VACANT.

PORTSMOUTH Municipal College—Appointment of Instructor and Lecturer in Motor Engineering.

WANTED, at once, instructor and lecturer in motor engineering; must be a practical man experienced, and capable of complete overhaul; principal work at present to take classes for disabled soldiers and others; salary, £200.—Application forms and further particulars may be obtained on forwarding stamped, addressed, foolscap envelope, to the Secretary at the Committee's Offices, the Municipal College, Portsmouth. [3032]

CANADA—An important group of British cycle and motor accessory manufacturers desire the services of a thoroughly competent organiser and salesman to manage their interests in the above territory. Local knowledge and sales experience essential. The opportunity offers almost unlimited scope for a keen and qualified man.—Apply, Box L9,044, c/o The Motor Cycle. [3608]

SITUATIONS WANTED.

YOUNG Man seeks position with large motor firm as sales manager, traveller, or demonstrator, life experience engineering, can drive and demonstrate any car; 2 years Government inspector.—Box 2,758, c/o The Motor Cycle. [X2995]

OFFICER, Royal Engineers, about to be demobilised, desires position or responsibility, excellent experience with highest class manufacturers in design and manufacture of all types of motor cycles.—Box 2,791, c/o The Motor Cycle. [X3244]

King Dick

Spanners
have jaws which
always
keep
PARALLEL
and
grip clean.

Famous for 35 years: guaranteed for ever. Four sizes 5in. to 9in.; of all good dealers.

See that your spanner is stamped with the Bulldog mark here shown—the mark of the genuine "King Dick."

Abingdon Ecco Limited,
Tulseley, Birmingham.
London: G. H. Smith,
12, Mortimer Street, W.



BURBERRYS' 1919 SALE.

1918 Suits & Topcats
Until end of February.

Motor Cycle Burberrys,
Lined tweed or fleece.

Usual price, 55 and 8 Gns.
Sale Price, 73/6 and 94/6.

The Burberry. World renowned weatherproof.
Usual price, 5 Gns.

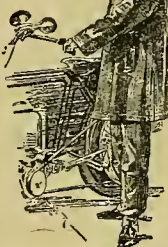
Sale Price, 73/6.

A large number of overcoats and suits in wool coatings is also available at reduced prices by personal selection only.

1/- extra on above prices for packing and carriage.

BURBERRYS Haymarket London S.W.1.

Write for
Sale List
of Bargains.



Patterns and self measurement form free

This Book should be read by every Motor Cyclist.

Send for it!

IRVINE SMITH,
BUTTERSHAW,
BRADFORD.

SITUATIONS WANTED.

GENTLEMAN, with good knowledge of engineering, high accuracy machine work, material testing, etc., desires position as working partner in motor or motor cycle business near London or Colchester.—Box L8,970, c/o The Motor Cycle. [3279]

PARTNERSHIPS.

ADVERTISER, with experience and capital, age 34, desires partnership in light car and motor cycle agency: Midlands preferred.—Box 2,797, c/o The Motor Cycle. [X3295]

DEMORILISED Officer, with capital at disposal and previous experience, desires an active interest in an established motor cycle agency business in the London district.—Marians, Strand Palace Hotel, London. [3439]

PARTNER Wanted to develop the lightweight motor cycle in the Midlands: capital not essential if energetic, as the whole business is manufacturing in large quantities.—Apply in first instance, Box 2,796, c/o The Motor Cycle. [X3291]

FINANCIAL.

WELL-KNOWN Motor Cycle and Light Car Expert requires £500 to form a company to specialise in repairs in London, excellent prospects; first-class agencies and contracts can be secured; interview in London by appointment.—Box L9,035, c/o The Motor Cycle. [3545]

GARAGES.

GARAGE Accommodation Offered to one or two careful motor cyclists, near Queen's Park, N.W.8; facilities for cleaning and repairs.—Write first, mentioning machine, S., 21, Kempe Rd., Kilburn. [3526]

WANTED.

SUNBEAMS, Harleys, A.J.S.'s, Enfields, B.S.A.'s, Nortons, Triumphs, Matchless, and Morgans; 1915's and later purchased for spot cash.—Mauds', 100, Gt. Portland St., London, W.1. [1916]

N.S.U. Speed Gear, to fit 3½ h.p. B.S.A.—Stoneleigh, Marseke-by-Sea. [X3109]

SWAN Sidecar, in good condition.—Box 2,755, c/o The Motor Cycle. [X2966]

REAR Stated for 5 h.p. Indian.—10, Park Av., Long-sight, Manchester. [X3114]

WANTED, motor cycle.—144, Dalling Rd., Hammer-smith, London. [3366]

HOOB and Screen, complete, for 6 h.p. Enfield.—P. F. Groom, Bury St. Edmunds. [X3155]

COMBINATION, any good make: no rubbish; cash.—M., 4, Dollis Rd., Finchley. [3125]

WANTED, model 9 T.T. Norton.—Goldsmith, H.M.S. Retriever, c/o O.P.O., London. [X3289]

DOUGLAS, 2½ h.p., not earlier than 1914.—Robertson, 39, Broad St., Peterborough. [X2771]

£2,000 Waiting for machines, any make; good prices given.—Liooths Motories, Halifax. [2641]

WANTED, A.C. Sociable, or similar make.—Sutton, 44, London Rd., Kingston, Surrey. [3241]

INDIAN Frame, 1913, 7-9 h.p., sprung, with or without forks.—24, Sydney Rd., Enfield. [X3223]

WANTED, 11 or 12-toothed free-wheel, ½ in. pitch by ½ in.—Body, Town Hall, Torquay. [3248]

WANTED, 4 h.p. Triumph or similar engine, about 1915.—24, Shakespeare St., Hove. [X3240]

100 Motor Cycles Wanted, spot cash paid: bring or send, Palmer's Garage, Totting. [0917]

WANTED, 1913 T.T. Triumph; also sidecar, fit Triumph.—46, Jubilee Rd., Doncaster. [X3150]

DOUGLAS 1914 2½ h.p. Connecting Rod and Piston wanted.—Truscott, New St., Sidmouth. [X3115]

DOUGLAS 4 h.p. Exhaust Pipes (without silencer).—84, Bowes Rd., Palmers Green, N.13. [3324]

LATHE, screw-cutting, 6 in. or 8 in. centre, hollow mandrel.—151, Globe Rd., Mile End. [3570]

TRIUMPH, 1914, 3 speeds: cheap for cash.—Stevens, Russell Villas, Russell Rd., Newbury. [X3332]

RUDGE Front Wheel, 26x24; pair plated touring handle-bars.—Taylor, Harker, Carlisle. [X3326]

VELOCETTE, lady's; state condition, price.—Eastwood, Sandal Hill Rd., Baildon, Yorks. [X3322]

WANTED, 20-tooth sprocket, for Indian gear.—Watson, Mill House, Prestbury, Cheshire. [X3239]

A.B.C. Sunbeam, A.J.S., or late model make.—The Deansgate Motor Exchange, Manchester. [0969]

WANTED, right side of gear box of 1915 9 h.p. Indian.—Kirkman, New Milton, Hants. [3302]

WANTED, Binks carburettor, twin, 6 h.p.—Bates, 79, Ransome Rd., Coventry. [X3376]

DOUGLAS Motor Cycle, required this week.—Write, 91, Clifton Rd., South Norwood. [3495]

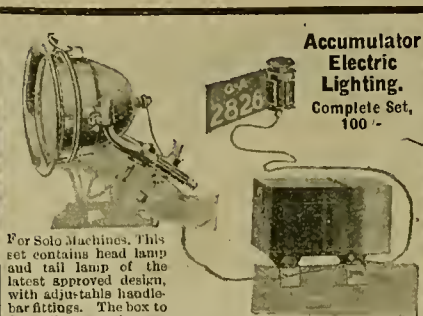
WANTED, magneto, V twin, anti, 6-8 h.p., 45d.—82, Corwall Rd., Brixton, London. [3517]

WANTED, combination, single-cyl., first-class make.—Box L9,039, c/o The Motor Cycle. [3549]

WANTED, motor cycle or combination: cheap.—Skelfon, 333, Acton Lane, Acton, W.3. [3419]

WANTED.

- ZENITHS**.—90×77½ twin.—Maudes'.
B.S.A., 1916, 1917, solo or combinations.—Maudes'.
A.J.S., 1916, 1917 combinations and lightweight.—Maudes'.
ENFIELD 1916 and 1917 Combinations.—Maudes'.
DOUGLAS, 1915, 1916, and 1917, 2 and 3-speed models.—Maudes'.
MATCHLESS, 1915, 1916, and 1917 M.A.G. engined combinations.—Maudes'.
HARLEY-DAVIDSON, 1917, electric and standard combinations.—Maudes'.
MORGANS, 1915, 1916, and 1917, water-cooled J.A.P. and M.A.G. models.—Maudes'.
TRIUMPHS, 1915, 1916, and 1917 lightweight and countershaft models.—Maudes'.
SUNBEAMS, 1915, 1916, 1917 single and twin combinations.—Maudes'.
MAUDES' Are Buyers of any of the above for spot cash. Very highest prices for machines in good condition.—100, Gt. Portland St., London, W.1. [3530]
WANTED, motor bicycle, 4-stroke; cheap.—Gooder, Brightview, Hadley Rd., New Barnet. [3428]
MOTOR Cycle, combination, or light car, known make.—42, Clementina Rd., Leyton. [3442]
CYLINDER, 3½h.p. Premier, also coach sidecar.—Phillips, 106, Ridley Rd., Forest Gate. [3335]
SUNBEAM Combinations; send particulars and price.—Service Co., 292, High Holborn, W.C.1. [9306]
WANTED, modern combination, also solo machine.—Albury, St. Mary's Rd., Frinton-on-Sea. [2716]
WANTED, motor cycle or combination.—Write Speechley, 1, Gunnersbury Lane, Acton Hill. [3411]
WANTED, 1913-14 3½h.p. Rover engine valves.—Nene Farm, Wollaston, Wellingborough. [X3227]
WANTED, Bradbury footboards, also Autodipe lamp.—Calvert, Market St., Chorley, Lancs. [X2493]
WANTED, 6h.p. J.A.P. engined combination, good condition; cash.—E. Ash, Nurseryman, Slough. [2917]
WANTED, 4-seater car, in good condition; cheap; no dealers.—Write 37, Winstanley Rd., Sheerness. [X2732]
WANTED, 48° Bosch magnet, anti-clockwise.—Particulars, Bainbridge, Witton, Gilbert, Durham. [X3116]
6h.p. or over combination, or cycle only, any good make.—Kings, Heath Bank House, Cheadle Hulme. [X3166]
COMBINATION, recent model, Sunbeam, or Enfield preferred.—405, Leeds Rd. North, Huddersfield. [X3185]
CYLINDER, 1912 Singer, 3½h.p., new or second-hand.—Coffin, 22, Gooden Crescent, Cove, Hants. [X3178]
WANTED, front cylinder, for 1912 5-h.p. Rex; deposit.—Bannister, 1, Gladstone Place, Brighton. [X3248]
WANTED, 1916 Powerplus Indian combination, spring frame.—5, Barden Park, Tonbridge, Kent. [X3256]
LIGHTWEIGHT, 2 or 4-stroke, cheap for cash.—17, Tamworth Park, Commonside East, Mitcham. [3379]
ANY Motor Cycle Bought, cash.—Wandsworth Motor Exchange, Ebner St., Wandsworth (Town Station). [3460]
ENFIELD Combination, not earlier than 1914; appointment.—Stanley, 764, Seven Sisters Rd., N.15. [3529]
HARLEY Combination; send particulars and price.—Service Co., 292, High Holborn, London. [8736]
ENFIELD Combination. Send particulars and price.—Service Co., 292, High Holborn, London, W.C.1. [8888]
ARIEL 5-h.p. Combination. Send particulars and price.—Service Co., 292, High Holborn, London, W.C.1. [8889]
50° Anti-clockwise Lightweight Magneto, for twin-cyl. engine.—Moore, Westville, Riddlesden, Keighley. [X2885]
WANTED, good solo and combination, not earlier 1914; spot cash.—45, Waterlow Rd., Highgate Hill. [3271]
MODERN Combination, 3-speed, A.J.S., Matchless, or similar machine.—Walton, Dawson Sq., Batterley. [X3349]
2-SPEED Gear Box, for lightweight, with clutch, chain-cum-belt drive.—Box 2,756, c/o The Motor Cycle. [X2967]
WANTED, two new or second-hand connecting rods, for 1915 2½h.p. Douglas.—Hall's Garage, Stevenage. [3309]
£1 Offered for out of order or damaged Armstrong VI. 3-speed hub.—Fletcher, 100, Exeter St., Bradford. [X3360]
WANTED, modern 6 or 8h.p. motor cycle and sidecar, second-hand, for cash.—Dan Guy, Weymouth. [X2496]
WANTED, motor cycle or combination, for cash.—F. J. Tolafield, 22, Loampit Vale, Lewisham, S.E.13. [3342]



For Solo Machines. This set contains head lamp and tail lamp of the latest approved design, with adjustable handlebar fittings. The box to fit on the top tube contains a 4-volt accumulator and a switch, giving sufficient light for the two lamps for approx. 10 hours at one charge. It, without doubt, fills a long-felt want for solo machine lighting.

ELECTRIC ADAPTER.

Price 4/9 each

Spare Bulbs, 2/- each.

This is a small fitting to enable owners of gas lamps fitted with burners of the Roni type (round stem) to make their lamps into electric.

The "adapter" fits over the existing burner with a tight fit, and is connected to an electric wire and battery.



Sidecar sets, complete, as above 153/-
 Motor Cycle sets, with accumulator in box, for fitting to top tube . . 100/-
 Lamps only, with handlebar fittings 45/6

F.R.S. LAMPS, "Beam" Works,
 BIRMINGHAM.

WANTED.

- 100** Motor Cycles Wanted for cash.—Wandsworth Station. [8582]
REQUIRED Immediately, a good sound machine or combination.—Lt. Temple, The Vicarage, Kensal Green. [3582]
WANTED, good solo, combination, or small car.—Capt. Allen Hyne, White House, Brixton Rd., S.W. [3471]
WANTED, motor cycle or combination.—Write full particulars, Vaughan, 41, Codrington Hill, Brockley, S.E. [3440]
WANTED, Roc 2-speed wheel with controls and back fork members.—Bainbridge, Witton, Gilbert, Co. Durham. [X3117]
MODERN Combination or cycle car, only good machine considered.—Robertson, 39, Broad St., Peterborough. [X2772]
WANTED, two countershaft gears, for a 3½ and 2½h.p., any condition.—Finnegan, Cullybackey, Ireland. [X2769]
BAT-J.A.P. and Sidecar Wanted, all chain drive, not earlier 1915.—Evans, 18, Christopher St., Llanelli, Carm. [X2766]
LIGHTING Sets and all kinds good accessories wanted for or exchanged.—The Deansgate Motor Exchange, Manchester. [10983]
WANTED, B.S.A., James, or other good make combination, or solo, not earlier than 1914, countershaft, kick start.—Sheppard, 41, Lichfield Rd., Stafford. [X3275]

WANTED.

- STERMEY** J.B. or Humber Roc gear wanted, one requiring repair not objected to.—20, Forrest St., Latchford. [3555]
SHED Required, floor, for sidecar combination.—Lieutenant McEvoy, 3, Claremont Rd., Crickwood, N.W. [3274]
1916 4h.p. 3-speed T.T. Norton, mileage under 3,000, all accessories, 60 m.p.h.; under £65.—Brampton, Elstree, Herts. [3331]
CARDEN Cycle Car, complete or otherwise. State price and fullest particulars.—Yelverton Garage, Yelverton, Devon. [3276]
BIG Twin, with or without sidecar; no objection slightly out of order; no dealers.—Word, 35, Tresham Rd., Derby. [3243]
1914 T.T. Triumph, clutch, or 1914 T.T. Triumph, 3 speeds model.—S. Metcalf, Jones Motors, Ltd., King St., Mold. [3322]
MOTOR Cycle wanted, lightweight, or will consider combination.—Please write particulars to 170, Red Lane, Coventry. [X3279]
WANTED, a really good late outfit, to stand daily wear; give full particulars.—Box L9,043, c/o The Motor Cycle. [3576]
ENFIELD, A.J.S., or similar combination.—Particulars at once to Hayes, 5, The Exchange, Thornton Heath. [3499]
NORTON Big Four and 3½h.p. T.T., recent date. Send particulars and price.—Service Co., 292, 11th Holborn, London. [8756]
MATCHLESS Combination or Enfield Wanted, purchase at once.—Harrison, 390, London Rd., Thornton Heath. [3494]
WANTED, motor cycle of known make; give particulars and lowest for cash.—Box L9,041, c/o The Motor Cycle. [3574]
WANTED, coachbuilt sidecar and chassis, complete, suitable 3½h.p. B.S.A.; cheap.—Gulliver, Steeple Morden, Royston. [X3179]
WANTED, twin sidecar combinations and Morgan runabouts, for cash.—Collier's Motories, Union St. South, Halifax. [3555]
WANTED, Triumph 3½h.p. cylinder and piston, also clutch, back wheel.—Mac, 28, Elphinstone Rd., Walthamstow. [3475]
COMBINATION Wanted, twin preferred, not earlier 1914, condition must be tip-top.—Box L9,038, c/o The Motor Cycle. [3548]
DOUGLAS Frame, 2½h.p., less bars, saddle, and wheels, must be in sound condition.—Jowett, 15, Brook Lane, Chester. [X3284]
DOUGLAS or Triumph, solo or combination, not earlier than 1914; no dealers.—33, Wilton Grove, Merton Park, S.W.19. [3281]
WANTED, sidecar, to suit 3½h.p. Rover cycle. State price and where it can be seen.—R. G. Waters, Forest Row, Sussex. [3242]
ROVER or Triumph wanted, not earlier than 1914; no dealers.—Particulars to Burton, 35, Queen Victoria Rd., Coventry. [X3282]
COACHBUILT Combination, Triumph, B.S.A., or Matchless, in sound order.—Waterman, Wyatts, Chorleywood, Herts. [3528]
RUDGE Multi, T.T. Isle of Man model; send particulars and price.—Service Co., 292, High Holborn, London, W.C.1. [3598]
WANTED, modern machines and combinations, Enfield, A.J.S., Sunbeam, Triumph, etc.—Parker's, Bradshawgate, Bolton. [X3321]
WANTED, sidecar, comfortable, coach or cane, fit 1915 7-h.p. spring frame Indian.—Captain Baldwin, Kingsdown, Deal. [X3232]
WANTED, good up-to-date second-hand accessories; state particulars and prices.—Service Co., 292, High Holborn, London. [8742]
STRONG, sound, F.E. single, clutch, cheap; also chassis for side box.—Hughes, Tanlan Stores, Bettws-y-Coed, N. Wales. [3353]
WANTED immediately, lady's Douglas, not earlier than 1915; private owner.—Newbury, 159, Conway Rd., Southgate, N.14. [3256]
WANTED, B.S.A. coachbuilt sidecar, good condition, luggage grid preferred.—Apply, Cooper, Stone Cottage, Wornley, Surrey. (D) [3394]
WANTED, a motor cycle suitable for solo or sidecar riding; only bargain entertained.—Box L9,042, c/o The Motor Cycle. [3575]
WANTED, F.N. 4-cyl. Motor Cycles, 7h.p. and 5h.p., at once.—Wandsworth Motor Exchange, Ebner St., Wandsworth (Town Station). [3458]
WANTED, rear portion of frame to fit 1911 single-speed Rex, Tourist.—Hitchins, 53, East Ferry Rd., Cubitt Town, London, E.14. [3344]
WANTED, A.J.S., 4h.p., spare wheel and tyre, for cash; would exchange Splitdorf 50° magneto, anti-clock, as new.—Barnup, 34, Gt. St. Helena, E.C.3. [3543]
WANTED, good make solo machine, 2-speed, late model. Full particulars and price, also mileage. Douglas preferred.—Homedale, Benhill Av., Sutton, Surrey. [3508]

WANTED.

WANTED. Enfields, combinations and solo machines. Matchless, or other good makes.—Please write. Brawn, 94, High St., Beckenham. [3431]

ENFIELD Combination, any other good make, or motor cycle; state particulars and lowest.—Osborne, Imper, 53, Jubilee Rd., Doncaster. [3296]

WANTED. 2-stroke 2-speed, good make, must be in excellent condition.—Full particulars to G. I. Arlington Mansions, Chiswick, W.4. [3250]

ENFIELD Combination, dynamo lighting preferred. 1914 or later model. Particulars, or call with lot week-end.—94, Hoppers Rd., N.21. [3372]

WANTED, in good order, Rex 5h.p. front cylinder, square fins, a.v.c. bore 5in., stroke 3 1/2in.—Phillips, Kingsett, Tetbury, Glos. [X3301]

WANTED, combination; good price given for suitable outfit.—Particulars and time to view, 436, Whitehorse Rd., Thornton Heath, S.E. [3416]

WANTED, Enfield, Harley, or Indian combination, for customer.—Wandsworth Motor Exchange, Ebner St., Wandsworth (Town Station). [3459]

WANTED, small single-cyl. magneto, U.H. or similar, any condition.—Charles Parker and Co., 75, Park Rd. North, Acton, London, W.3. [2727]

INDIAN 7.9h.p. Solo or Combination, not earlier than 1914, any condition; price reasonable.—Lieut. B. Brentwood, Beckfield Lane, Acomb, York. [2728]

MOTOR Cycles, cars, lorries, etc., etc., required; full value paid.—Southern Motor Co., 230 232-234, Brixton Rd., S.W.9. Established 1895.—[3470]

INDIAN Combination, red Powerplus, not earlier 1915, 2-3-speed, good condition; reasonable price for spot cash.—The Cherries, Maidenhead. [3550]

WANTED, Enfield 2-speed or H.D. or Indian Combination; no dealer, no fancy prices; full particulars.—Box L9,040, c/o The Motor Cycle. [3573]

TYPEWRITER Wanted, Remington, Oliver, or Underwood preferred; also roll top desk, chairs, and safe.—Works, 80, St. Aidans Rd., E. Dulwich. [3596]

WANTED, 2-speed lightweight (not earlier 1914), mechanically perfect essential. Write particulars, lowest for cash.—Rev. Bethel, Ironbridge, Salop. [X3323]

WANTED, back wheel for Bat, with clutch, spindle, and sprocket wheel, complete, 650x65, chain drive.—Lloyd Morris, Hendrie Wen, Llanrwst. [X3263]

WANTED, cylinder and piston complete, for 1911 Rex, 3 1/2h.p., new or second-hand; good price for good article.—Box 2,790, c/o The Motor Cycle. [X3250]

WANTED, front and back mudguards (less tail-piece), for P. and M., 1914; new or decent second-hand.—Organ, Newsagent, Wotton-under-Edge, Glos. [X3154]

WANTED, 8h.p. T.T. J.A.P. engine machine, overhead valves, belt drive; must be in good condition.—Cohen, 150, Kingston Rd., New Malden. [X3183]

100 Motor Cycles wanted; bring or send; for spot cash.—Palmer's Garage, Tooting. [5845]

WATSONIAN Collapsible Sidecar wanted, good condition; cheap.—State price and particulars to Hayes, 20, Railway St., Farnworth, near Bolton. [X3257]

DOUGLAS Combination wanted, about £50; no dealers. State age, condition, accessories, etc.—Owner, Sutherland House, Windlesham, Surrey. [3260]

WANTED, second-hand motor bicycle, not above 3 1/2 h.p., in exchange for new bicycle and part cash.—Box J., Smith and Son, 51, City Rd., Chester. [3301]

WANTED, powerful combination, cheap for cash; A.J.S. or Harley preferred; any condition, not earlier than 1914.—Else, Daisy Bank, Matlock. [X3277]

INDIAN or powerful combination, or Levis, or other 2-stroke might suit; also sporting C.B. sidecar wanted.—19, Wilcox Rd., South Lambeth, London, S.W.8. [3512]

JAMES 5.6h.p., or Sunbeam 3 1/2h.p. State full particulars and lowest price for spot cash. Must be in good condition.—Reply, Box L8,969, c/o The Motor Cycle. [3261]

COMBINATION Wanted, modern twin; cash willing. Particulars and price. Would exchange 3h.p. 1917 Enfield and cash.—80, Beach Rd., Sparkhill, Birmingham. [3350]

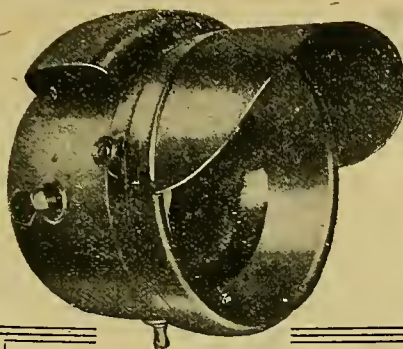
J. SMITH and Co., 16, Hampstead Rd., N.W.1, are open to purchase modern combination and solo machines. Exceptionally high prices paid for modern machines. [3565]

2-SEATER Car, Rover, Swift, Sizaire preferred; exchange 1917 6h.p. Mosacoe combination, little used, cash adjustment.—Richards, Phoenix Cottage, Leicester. [X3286]

MATCHLESS 1914-18 M.A.G. Engine Combinations for cash, or exchange new Victory models; best cash allowance.—J. Tassell, 19, Bloomsfield Rd., Plumstead, S.E.18. [X1794]

TRIUMPH 1914 engine unit complete, good condition; also N.S.U. gear, fit Triumph, and Best and Lloyd drip-feed complete.—Morgan, 17, Athfold Rd., Clapham, S.W. [3481]

MODERN Combinations, motor cycles, and light cars; distance no object; cash payments. Phone, write, or call.—Moore's Presto Motor Works, Ltd., Tauxwally Rd., West Croydon, Surrey. Est. 1881. Croydon 1545. [2227]



Powerful Motor Cycle Lamps

with 5 inch face to satisfy the present law.

British made of solid brass, nickel finish, lens mirror combined with parabolic reflector so fixed that the light is thrown a long way ahead as well as on both sides of the road. Fits standard brackets. High quality. Delivery from stock.

Complete price list free.

BLERIOT
Ltd.,
58 Long Acre, London, W.C.2

VICTOR TYRE.

The Victor Tyre Company offer
the following Clearance

MOTOR CYCLE COVERS

at greatly reduced prices,
namely:

26 x 2 Ribbed at 10/- each.

26 x 2 1/2 " at 11/- "

26 x 2 3/4 " Rubber-studded at
20/- each.

Victor Tyre Company, Limited.

15, Carteret Street, Westminster, S.W.
Telephone—Victoria 2785.

ORTO WINDSCREENS, HOOD, AND APRONS.

ORTO WINDSCREENS, 4 Types, SINGLE.
SLIDING TRIPLE, TRIPLE SLIDING, from 34/6.
ORTO HOOD, complete with Side Curtains, 60/-.
ATKINSON'S, 306, Uxbridge Road,
SHEPHERD'S BUSH, W.12.
Lists Free.

WANTED.

WANTED, carburettor suitable 8-10h.p. engine, 1 1/4in. intake, B. and B. or Binks preferred, perfect; no duds.—Rogers, 65, Church Rd., Burgess Hill, Sussex. [3497]

WANTED, F.N. 2 1/2h.p., not earlier than 1913, must be in first-class condition and cheap for cash.—Full particulars to Lieut. Commr. A. M. Barnes, "Verdon," Portsmouth. [3412]

SMALL Car, single or twin, Sizaire, Jackson, or Dion preferred, any condition; cheap for cash, or exchange Sun 2-stroke, as new.—Lieut., Apsley, Fellow's Rd., Farnborough, Hants. [X3122]

WANTED, several good solo machines and combinations, for spot cash, or sell on commission; 5% when sold; no sale, no charge.—Youngs, The Parade, Kilburn, Hampstead 4807. [0977]

THE H.C. Motor Co. requires good combinations and solo machines for cash. Send or bring your machines to us. Cash offer made on sight.—H.C. Motor Co., 247, Finchley Rd., N.W.3. [1193]

ANYTHING to Sell? Motor cycle, cycle, lathe, tools, magnetos, parts, accessories. We can sell quickly for you, and get you top price.—The Mart, 151, (Sale) Donian Rd., King's Cross, London. [3285]

SPOT Cash for Triumphs, Douglas, A.J.S., Enfields, Brough, Nortons, Hendersons, Sunbeams, Zeniths, Harley-Davidson. Write, call, or Phone Holborn 5777.—Wanchope's, 9, Shoe Lane, London. [1334]

GRADO Gear (ball thrust pattern), to fit Bradbury or Triumph; also Triumph or Bradbury clutch wheel, complete with controls, must be good condition.—Smallwood, 18, Park Rd., Moseley, Birmingham. [3288]

WANTED for cash, heavyweight combination, condition immaterial, 1914 or later, Harley or Matchless preferred, but not essential. State absolutely lowest price.—Sgt. Belcher, Ordnance, Ashford, Kent. [3347]

WANTED quickly, Douglas combination, second-hand; no dealers; good machine, good price. Write, stating price, mileage, condition, where to view near Ascot.—Box L8,968, c/o The Motor Cycle. [3259]

WANTED, good combination, not earlier than 1914, in exchange for full iron frame piano, by Marshall, Huddersfield, in new condition.—Particulars to Pycock, 14, Wood St., Mexborough, near Rotherham. [X3241]

PERCY and Co. require at least 100 second-hand motor cycles and combinations. Please offer us your mount. We offer exceptional high prices. We pay you cash on sight.—Percy and Co., 337, Euston Rd., London. [0925]

THE H.C. Motor Co. can take a few good motor cycles and combinations for sale on commission, 5% only charged when sold; no other charges.—Write for full particulars, The H.C. Motor Co., 347, Finchley Rd., N.W.3. [1200]

WANTED, Armstrong Mark VI. or VII., or Sturmeys J.S. or J.A. gear, complete, with or without controls and wheel, any condition; also countershaft gear box; all must be cheap.—33, Wilton Grove, Merton Park, S.W.19. [X3282]

WANTED, Indians, B.S.A.'s, Sunbeams, Triumphs, Enfields, Harleys, A.J.S.'s, Matchless, Douglases, Zeniths; spot cash. Send particulars and price.—Wandsworth Motor Exchange, Ebner St., Wandsworth (Town Station). [2524]

WE Are Wanting several solo machines and combinations. Send full particulars, and representative will call with cash and take away if suitable, or will exchange with piano or furniture.—Bunting, Mason's Av., Harrow. [7200]

FREE Engine Wheel complete and all controls, with rear part of frame, for 1911 Triumph; also 3-speed wheel and all controls, with rear part of frame, for 1911 Triumph; approval against deposit.—130, Lincoln Rd., Peterborough. [X3370]

WE are buyers of motor cycles of the following makes, not earlier than 1914: A.B.O., A.J.S., Brough, Enfield, Harley-Davidson, Henderson, Indian, Norton, Sunbeam, Triumph, Zenith, and other good makes.—Write, giving particulars and prices, Service Co., 292, High Holborn, London. [8743]

REWARD. Reward.—Why of course you will be rewarded if you sell the machine you wish to dispose of to Longman Bros., of 2, King's Parade, Acton, because they will give you every attention, pay you a fair price, and send a competent representative to complete the transaction with you for cash. No trouble, and the matter ended.—Tel.: 1578 Chiswick. [3173]

SEND Your Motor Cycle to Palmer's Garage, Tooting, Wimbledon Station. Cash offer will be telegraphed immediately on receipt of machine. Machine can be included in fortnightly auction without charge if offer not accepted. Reserve price may be fixed.—Sole address, Palmer's Garage and Auction Rooms, 183-199, High St., Tooting. [0918]

DOUGLAS. Douglas, Douglas.—Wanted at once for spot cash, second-hand 2 1/2h.p. and 4h.p. Douglas motor cycles. We are prepared to pay you the best possible price for your machine either in part payment for a new Douglas, or we will purchase outright. Send us full particulars and the engine number, and we will make our offer by return. Spare parts of every kind wanted. We are completely sold out of new machines, but we can offer you favourable delivery of the all black and 1919 models. If you are interested in Douglas machines, call and see us.—Virian Hardie, Ltd., Douglas experts, 24, Woodstock St. (off Oxford St.), Bond St., London, W.1. [0987]

WANTED.

DOUGLAS. Douglas. Douglas. Wanted, at once, second-hand machines; best prices paid. We are prepared to buy complete machines or any parts in good condition for spot cash. Send us details and we will make our offer by return of post.—Vivian Hardie, Ltd., Douglas Experts, 24, Woodstock St. (off Oxford St.), Bond St., London, W.1. Always open. [0985]

BRIGHTON Motor Exchange.—Private owners wishing to dispose of motor cycles, combinations, light cars, accessories, spares, etc., write us at once. We have a long waiting list of buyers on South Coast and in Southern counties. We buy, sell on small commission, or take in part exchange. Repairs by skilled staff.—Brighton Motor Exchange and Garage, 73, Preston St., Brighton (opposite West Pier). [0984]

EXCHANGE.

MAUDES.

MAUDES' Arrange Exchanges on any machines; best allowance for modern machines. See other columns for particulars.—Maudes', 100, Gt. Portland St., London, W.1. [2850]

EXCHANGE twin Indian, develops 5b.p., or sell. See Indian column. [X3202]

NORTON 3½h.p., T.T. and sidecar, for good twin combination, or sell. See sales column.—Albert. [X3446]

EXCHANGE 1915 2½h.p. 2-speed Calthorpe-Jap and £10 for 4h.p. twin, 3-speed.—Apply, Box 2,789 c/o The Motor Cycle. [X3230]

22h.p. Silent Knight Daimler (touring body), for motor cycle and cash, or sell £230.—Hollymount, Blackheath Hill, S.E.10. [X3435]

EXCELLENT 1913 Scott, new front tyre, splendid throughout, for lightweight and cash, or sell £32.—Wilton, Dawson Sq., Burnley. [X3348]

EXCHANGE 1916 Ford Van, detachable wheels, as new, guaranteed, for high-class combination and cash, or sell 190 gns.—21, Monney Rd., N.19. [X3380]

BAT 4h.p., perfect running order (value £15), and 25 cask for lightweight 4-stroke Douglas preferred.—Whitley, 1, Mayville Rd., Leytonstone. [3292]

EXCHANGE laboratory, chemicals, apparatus, worth £100, for good motor; suit college or student; or would sell.—Box L8,977, c/o The Motor Cycle. [3303]

YOUR Old Machine taken in exchange, and earliest deliveries given of Clyno, P. and M., Levis, and James. Best allowances.—Martin Mitchell, Ltd., Stafford. [X2924]

EXCHANGE 3½h.p. Rudge, as new, speedometer, horn, lamps, and cash, for 6h.p. combination, or sell.—Apply any time, Thomas, 64, Church St., Edgware Rd., N.W. [3395]

EXCHANGE 2½h.p. Phoenix-Minerva, going order, battery ignition, combination, sidecar, and portable shed wanted; appointments.—Meads, 195, High St., Lewisham. [3294]

120 Children's Winter Jackets, sizes 27x39, value £120, for combination, Matchless, Enfield, etc.—Write only, M.T., c/o Belbarnie, 104, Beaconsfield Rd., Tottenham. [3563]

ALLDAYS Midget Light Car, 2-seater, splendid condition, for Enfield combination, not earlier than 1915, hood, screen, electric lighting set.—E.J., 804, Seven Sisters Rd., S. Tottenham, N.15. [3482]

10h.p. Talbot, tonneau body, artillery wheels, Stepany, spares, good condition; exchange good piano with player, or player-piano with music.—F. Smith, 2, Hampden Av., Hampden Park, near Eastbourne. [3418]

6h.p. Zenith-Gradua Combination, handsome coach-built underlending sidecar, splendid condition, fully equipped; 55 gns.; exchange lower power, cash adjustment.—35, Mowbray Rd., Brondesbury. [3441]

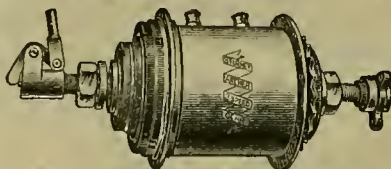
WRITE to us about that exchange deal you are contemplating. We can quote you the best allowance. Your old machine taken in part payment for a new machine, for early delivery.—The H.C. Motor Co., 347, Finchley Rd., N.W.3. [2243]

ZENITH-GRADUA, 3½h.p. J.A.P., late model, top hole condition, very fast, Bosch, new Douglas, accessories, £35; exchange with cash for K.S. counter shaft combination. No enquiries solicited from the crock owners' and take merchants' brigade.—H.D.C., 117, East Rd., London, N.1. [3541]

6h.p. Zenith, and Watsonian Aero C.B. sidecar, 1915, wind screen, lamps, horn, the whole outfit in lovely condition. T.T. model, very fast and powerful; will exchange lower power combination, B.S.A. preferred, or sell £65. Privately owned.—Chas. Bell, 39, Penrhyn Rd., Kingston-on-Thames. [3507]

HOUSEHOLD Furniture, or sell.—Clements cycle car chassis, complete, less power, and tyres, £20; copper radiator, £21/0; Triumph motor cycle, less unit, £8; pair of P.M. wheels, £1; sidecar wheels, 7/6; Indian gear box, less clutch, £5; Triumph engine, £7; sidecar, underslung, sporty, metal body, £4; Chatter gear box, £5; 1912 Rex frame, 50/—; Rex J.A.P., De Dion cylinders; pair of Chatter hubs, 10/—; Rex twin engine, 6h.p., £41/0; Rover frame and tank, £2; 5h.p. twin Peugeot, £5; No. 7 Chatter frame, forks, tank, wheels, bars, saddle, £81/0; 4-cyl. Splittord magneto, £6; waterproof Dixie, £4; Bosch, £21/0; Motosechoche spring forks and wheel, 30/—; Chatter frame, 30/—; Curtis, 127, Ladysmith Rd., Brighton. [3527]

ARMSTRONG AND STURMEY ARCHER



Hub Gear Repairs.

We can supply all parts for all types from stock. Repairs to above gears in one day. Douglas gear box parts in stock. Any Countershaft Gear Part Made.

Send pattern parts if quotation is required as we are not acquainted with every type of gear box made.

CROMWELL ENGINEERING CO., 327, Putney Bridge Road, London, S.W.15.

Phone: 1001 Putney.

Remove all outside axle fittings when sending gears, and attach two labels with senders and our addresses, via L. & S.W. Railway, Putney Station.

THE CHATHAM HOUSE

FOR MOTOR CYCLES.

1919 MODELS IN STOCK.

TRIUMPH	Model H	£85	0	0
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F. BANNISTER, Railway Street,
CHATHAM.

REPAIRERS.

DOUGLAS. Douglas. Douglas.

WE make a speciality of Douglas overhauls.

IF your Douglas wants repairing or tuning up, we can do it.

OUR Staff are all Douglas experts.

OUR Charges are Reasonable.

VIVIAN HARDIE, Ltd., Douglas Experts, 24, Woodstock St. (off Oxford St.), Bond St., London, W.1. Always open. [0986]

FOR Motor Overhauls and Repairs try Kay, 146, St. Sepulchre Gate, Doncaster. [X3231]

ARMSTRONG Gear Repairs, promptly and efficiently.—County Engineering Co., Hounslow. [8500]

FOSTER, of 170, Cardigan Rd., Leeds, is again at your service, and can now undertake any class of welding and machine work.

CYLINDER Grinding and Piston Making is with us a speciality. We shall be glad to have your enquiries.—Foster, Leeds.

PISTONS—We specialise in the manufacture of special aluminium alloy pistons, in hundreds or odd ones.—Foster, Leeds. [0310]

PISTON Rings, high grade, low price: standard or oversize.—Patent Rings, 30, Wigan Rd., Atherton. [1758]

WELDING Broken Cylinders, flanges, combustion heads: immediate attention; reasonable prices.—Below.

WELDING Aluminium Crank Cases, gear boxes, by experts of 11 years' experience.—Below.

CYLINDER Grinding on latest machinery installed since hostilities ceased; accuracy guaranteed; new pistons fitted.—Sadgrove and Co., 140, Conybere St., Birmingham. [X0803]

ENGINES and Gear Boxes Overhauled, rebushing and gear cutting a speciality.—G. Pilkington, Midland Garage, Beechwood Av., Coventry. [3118]

WELDING, Brazing, and General Repairs; work guaranteed; enquiries solicited.—Write D., 25, St. Lawrence Rd., N. Brixton, S.W.9. [3266]

NEW Pistons Fitted, rebushings, gudgeon pins, and valves to suit any make or year.—Russell Engineering Co., 57, Trafalgar St., Sheffield. [3345]

PAINTING, body building, conversions, hoods and screens to clients' requirements; quick deliveries; quotations with pleasure.—Palmer's Garage, Tooting. [9981]

REPAIRERS.

CENTRAL Motors (Oldham), Ltd., undertake to thoroughly overhaul and repair any make of motor cycle.—Below.

BROKEN Frames, forks, crank cases, connecting rods, pistons, cylinders, etc., welded by the process of oxy-acetylene. Send your enquiries. All work guaranteed.—Below.

WE Repair all makes of gear boxes, N.S.U. gears, etc. All repairs promptly attended to.—155, Huddersfield Rd., Oldham. [2694]

STURMEY or Armstrong Hub Gears Repaired promptly, or parts supplied.—The Rotary Jointing Co., Regent St., Warrington. [3554]

ELECTRIC Lighting Sets, starters, motors, dynamos, and condensers repaired.—W. Mantle, Electrical Engineer, 45, Canterbury Grove, West Norwood. [3081]

ENAMELLING, plating, tanks renovated as new. Send your parts to Murray's Plating Works, Union St., Coventry. Electro platers to the trade. [X3261]

N.S.U. 2-speed Gears.—We execute repairs to these gears promptly, and supply replacements for all types.—Eagles and Co., Acton Hill Works, Acton, London, W.3. [X9676]

GROVER, Smith, and Willis, Basingstoke, will make a first-class job of your repairs. We have a fine machine shop and welding plant and skilled mechanics. [3534]

HUB Gears.—Armstrong and Sturmeys motor cycle hub gears repaired and parts supplied; repairs and overhauls of Triumph engines a speciality.—G. A. Dolby, 60, Baker St., Sparkhill, Birmingham. [X1733]

SWIFT of Coveotry, Ltd., undertake the thorough repair and overhaul of any make of motor cycle at their large and well equipped repair works, 132-134, Long Acre, W.C. Enquiries invited. [7931]

HARLEY-DAVIDSON Repairs and Overhauls carried out by skilled staff. We are now in a position to put work in hand without delay.—Harley-Davidson Motor Co., Ltd., 74, Newman St., London, W.1. [2268]

MOTOR Cycle Cylinders Rebores and Ground, new pistons, rings, and valves, any pattern; valve settings tried up at shortest notice.—Vulcon Engineering Works, Vulcan St., Walsden, near Todmorden, Yorks. [9876]

SOUND Repairs to motor cycles, magnetos, carburettors, etc. No notching. Skilled work only. Prompt attention, reasonable charges.—The Murt, 151, Caledonian Rd., King's Cross, London. Plating and enamelling. [3286]

BURST Motor Cycle Covers Remoulded and made perfect; broken away heads remoulded; every job a success, or cash refunded; bursts from 3/6; rubber-studded retreading, 14/6; returned carriage paid quickly.—Melton Rubber Works, Melton Mowbray. [3566]

H. AND S. will make your old machine absolutely as new; overhauls a speciality; enamelling, plating, at minimum cost. If you want the maximum power out of your engine, bring it to us and we will get it for you.—H. and S., 47, South Lambeth Rd., Vauxhall, S.W.1. [3584]

GEARS, Gears, Gears.—We make any gear part for car or motor cycle. If you require quotation, send pattern parts. Do you have trouble with your gears? If so, send your box complete to us, and we can redesign the gears when making new parts.—Cromwell Eng. Co., 327, Putney Bridge Rd., S.W.15. Phone: Putney 1601. L.S.W. Ry. [2399]

ARMSTRONG and Sturmeys-Archer Gears.—All parts for every type in stock. We repair these gears promptly. Douglas gear box parts made and stocked, also parts for countershaft gears. Let us make those replacement gears you cannot obtain.—Cromwell Engineering Co., 327, Putney Bridge Rd., S.W.15. (L.S.W. Ry.) Phone: Putney 1601. [1689]

OLIVOS Motors, 120, Bollo Bridge Rd., Acton, W.3.—We are now open to undertake all classes of motor cycle repairs and overhauls. We have experts who can tune your engine for economy, speed, easy starting, and silence. Our plant and staff enable us to guarantee all our work, and there is nothing too difficult for us to do. It will pay you to give us your consideration. What Olivos promises, Olivos performs. [X2181]

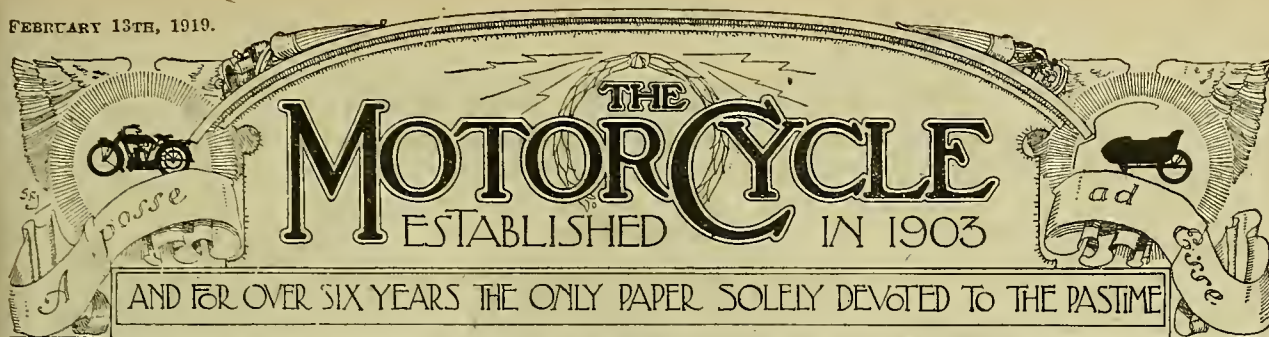
ARMSTRONG and Sturmeys-Archer 3-speed Hub Gears.—F. E. Jones, Muswell Hill, has given up the trade and supply of replacements for the Armstrong and Sturmeys-Archer 3-speed motor cycle hub gear, and the County Cycle and Engineering Co., Staines Rd., Hounslow, have purchased the stock.—The County Engineering Co. hold a complete stock of these parts, and can repair these gears at once.—County Engineering Co., Hounslow. Phone: 322 Hounslow. [2602]

TENNANT Engineering Co., Pershore St., Birmingham, pre-war engineer motor repairers, now released from Government control, are again able to undertake every description of machining and repairing in connection with motors or other form of traction. Cylinders rebored, new pistons fitted; Engines rebushed, thoroughly overhauled and restored to highest efficiency; unobtainable parts duplicated; frames altered and repaired; welding by real experts; prompt delivery; all work fully guaranteed. [X2887]

MISCELLANEOUS.

X'ALL Saddles, scarcely used; guinea.—34, Rodger Rd., Roehampton, S.W.15. [3548]

CHAINS, compression taps, and scarce sundries at reasonable prices.—Crow Bros., Guildford. [9779]



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SOUTH AFRICA—Central News Agency, Ltd. PARIS—Smith's English Library, 248 Rue Rivoli.

Unrationed Benzole.

COMMENCING on Friday last, benzole may now be purchased for use in motor cycles, cars, etc., without a permit from the Petrol Control Department, and therefore without the payment of the tax (6d. per gallon) which had lately been levied upon it as well as on petrol. This must be regarded as an important concession, as it is another proof that the Government are alive to the urgent need of a home-produced fuel which can compete, even in a small way, with petrol. Our readers are aware that a tax of 1s. a gallon is payable on petrol (6d. is included in the price and 6d. payable in advance to the Petrol Control Department). A short time ago the advisability of placing a similar tax upon benzole was considered, but it was finally decided not to impose the 6d. which is included in the price, and now, as we have already stated, the rest of the tax is removed. This is the first real evidence of official support for a home-produced alternative fuel for motor vehicles.

It was lately rumoured that the petrol combine was endeavouring to purchase the whole output of benzole. This step should be opposed at all costs, for if it were brought about the possibility of a cheap, or even moderately cheap, fuel would disappear into the dim and distant future. It is most desirable that benzole should be under separate control and sold at a price which will give a reasonable profit to its producers. This question of price is a very vital one, and for that reason we have repeatedly urged motorists and the motoring organisations to combine and guarantee a market for benzole at a fair price, for if this incentive be lacking the supply will inevitably fall off. It was stated last week that the gas companies were petitioning the Government against the extraction of benzole from gas. The amount of benzole to be obtained in this way is quite considerable, and we understand that when incandescent burners are used there is no noticeable difference in the illumination. We

hope, therefore, that the request of the gas companies will not be granted without due consideration being given to all the points at issue.

Again, of vital importance to the supply of a home-produced motor spirit is the question of quality. The first benzole supplied in pre-war days was inferior in this respect, and contained sulphur, which had a very deleterious effect upon the engine, causing much pitting of valves and other more or less indefinite troubles; moreover, it was dirty. Later the benzole known as 90% gave very good results if it was properly used, and though the carbon deposit was rather larger than that produced by the best petrol, it had the advantage of being more easily removed. The ignition temperature of benzole being high, knocking and pre-ignition were practically absent when this fuel was used. In fact, some engines cannot be made to knock on benzole.

In 1913 and 1914 we used benzole regularly with considerable satisfaction. The power was excellent, and when the carburettor was properly adjusted the consumption was about 20% to 25% better than when petrol was used. The jet should be reduced slightly in size, and the float weighted to allow for the higher specific gravity of benzole, and during a frost it is advisable to mix a little petrol with the benzole to prevent freezing. We have not yet had an opportunity of testing post-war benzole, but we regret to say that information reaches us to the effect that it falls short of what it should be. This is much to be regretted, and if the benzole producers, at the commencement of their campaign, content themselves with anything but the best, the results are likely to prove unfortunate for home-produced fuel. Many of us know what benzole should be like, and what it doubtless will be like when the production settles down, but if new riders experience much trouble in their early experiments with benzole, the fear is that they will discard it for good and all, and utterly condemn what really can be an excellent fuel.

AN INGENIOUS REPAIR.

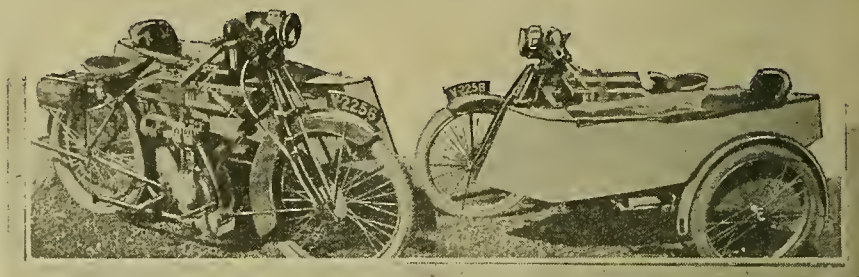
Rebuilding a Cylinder and Fitting a Buffer to the Spring Forks.

AT the present time, when it is difficult to procure replacements, and it is advantageous to do all repairs possible at home, the following description of the redemption of a cylinder which seemed beyond repair should be of more than usual interest.

Owing to a faulty casting the cylinder head of my 1914 T.T. Premier blew off one day, when starting up, at the first explosion, but, fortunately, no other damage was done beyond a dent in the tank.

The makers were unable to supply a new cylinder, and welding was out of the question, as part of the head was lost. It was therefore decided that a detachable head should be fitted.

The portion blown away was only the flat top of the cylinder, so that it was possible to dress off the ragged edges



(Left) The $3\frac{1}{2}$ h.p. Premier, on which the repairs and other improvements were effected. (Right) A "cruiser" sidecar the body of which was entirely constructed by its owner.

The material found most suitable for the joint was graphited compressed asbestos fibre $\frac{3}{32}$ in. thick, painted with boiled linseed oil. This jointing material was mostly squeezed out by the pressure of the bolts, which were tightened up when warm.

The engine runs quite satisfactorily with this head, but the joint requires renewal about every thousand miles. This, however, is no great drawback, as it can be quickly replaced, and, of course, the cylinder may be decarbonised at the same time.

Easy Starting Device.

I have a small petrol tank fitted on to the top tube for starting when using heavy fuels. From it a small copper tube goes down to a hole in the induction pipe, between the carburetter and the engine. The end of this tube is beaten over to form a very small jet. For starting, the main petrol tap is left shut. The air lever is shut, and the throttle very slightly opened. The tap on the auxiliary tank is then opened, and after waiting about three seconds the machine may be pushed off and will start at once. When the machine is once started the main fuel may be turned on, and the auxiliary petrol may be shut off almost immediately. This auxiliary tank was made from an ordinary carbide tin.

At the time when the water injection craze was on this tank was used for water. The water was used on steep hills, and, although it reduced the tendency to knock, it also reduced the power, giving a much duller exhaust. It was on the whole, however, a help in hill-climbing. If used on the level it somewhat reduced the speed. Its use was discontinued for fear lest it might damage the cylinder or valves.

The Hot-air Intake.

A hot air intake is fitted, but it was rather difficult to make a neat one to suit the Senspray carburetter, because the direction of the air flowing into the carburetter had to be completely reversed. The problem was solved by getting a semi-circular bend from an old horn, which fitted over the air intake on the carburetter. The other piece, from the end of this bend to the cylinder, was made from tinplate soldered up. It was secured to the cylinder by a piece of wire which passed through a loop and went round the

cylinder between the fins, where it was quite out of sight.

Fork Improvements.

The machine is fitted with Terry spring links on the front forks. They have made a great improvement in the riding qualities of the outfit; but it was found that, when riding fast on rough roads, the forks sometimes sprang back far enough at the top end to strike the steering head. They did not strike hard enough to do any damage, but the sound of the blow was such as to be annoying to one taking a sympathetic interest in his machine. To obviate this, a rubber buffer was fitted on the top spindle bearing, between the fork girders.

The sidecar body was entirely made by the owner. The floor is of $\frac{3}{4}$ in. pine-wood and the sides of $\frac{1}{2}$ in. three-ply. The space at the back of the seat has a lid over it, and forms a capacious locker. The weight of this body is no more than that of the original wicker one, and it is very strong.

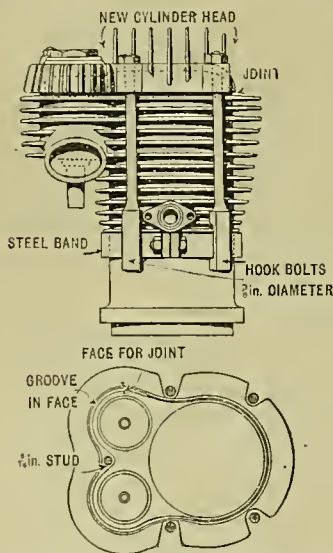


Illustrating the method of securing the rubber buffer to the top fork spindle bearing.

The valance of the sidecar mudguard, which is a great improvement, is made of stout American cloth enamelled over, and secured to the mudguard with small hooks, which pass through $\frac{1}{4}$ in. holes drilled in the guard. The roll seen on top of the tank in the near side view of the machine is a mudshield made of American cloth. It is very handy and useful, for it may be fitted and removed in a couple of minutes, and can always be carried on the machine.

J. A. D. TURNER.

On another page we tell of the road conditions in various parts of the country. We shall be pleased to hear from all road users as to the state of the roads in their district for the common benefit. Generally speaking, the majority of the main roads throughout the country are in a poor state, though brave attempts at repairing are being made by one or two of the more enlightened county councils.



(Top) Showing how the new detachable head is secured to the body of the cylinder.

(Bottom) The face of the top of the cylinder after being ground to receive the head.

and get a flat face all round, just above the valve seats. The shape of this face is clearly shown in the sketch.

A Satisfactory Job.

A pattern for a new head was then made, with four lugs for holding-down bolts, and bosses for the original valve caps. This was cast and machined, with a flat face to lie on top of the cylinder. It was held down by four $\frac{3}{8}$ in. diameter hook bolts and a $\frac{1}{4}$ in. diameter stud. The hook bolts were made of spring steel, for strength, and also to allow for expansion of the cylinder. They were located in slots cut in the cooling fins, and hooked on to a steel band clamped round the plain portion, just below the lowest cooling fin.

To ensure a gastight joint the faces of the cylinder and the head were scraped, and, in addition, a very fine groove was chipped all round the cylinder face, to prevent the jointing material being blown out.

OCCASIONAL
COMMENTSBY
"IXION"

"Clean" Design.

THAT word "clean" conveys an impression that cannot be defined. Perhaps an illustration is the best method of approaching my meaning. The other day I stood among the staff of a certain factory who were busy designing their 1920 car. Before us were the chassis of the best British and the best American car in the class which the unborn 'bus is destined to adorn. The British chassis had wooden running boards, supported by numerous brackets, covered with rubber mat, secured by aluminium beading and brass screws. Various accumulator boxes, etc., stood up four square at intervals along the boards. The gaps between the boards and the frame were filled by patent leather valances, secured by brass turn-buckles. The front and rear springs, with shackles, greasers, etc., came outside the valances. The frame was inswept at the front and upswept at the stern. By contrast the American frame had straight, flat side members, set nearer together at the front. The side members were very deep, and pressed into such a shape that they acted as valances and running boards as well. The springs were inside the frame and invisible. This car was much the prettier of the two, a far better production job, and cost 40% less to buy in this country, after paying freight, insurance, and import duty. Now which of these chassis has the more pronounced affinities with motor cycles? To select a minor item, has anybody ever yet produced a handle-bar, a crank case, a gear box, or a back wheel hub unit of really "clean" design? And cannot our designs be "cleaned" up?

The Difficulty.

OF course, a motor car is a civilised being, and wears clothes: all its indecent intestines are secreted beneath the bonnet, coachwork, and floorboards, and none of its works need show except the steering connections and back axle, which are not obtrusive. By contrast the motor cycle is a naked savage from a kraal, and as long as it is air-cooled, portions at least of the machinery must remain exposed. But there is neither need nor excuse for the myriad dirt and rust-collecting crannies which still characterise the machines of all nations. Whether we consider the handle-bar with its assortment of levers and accessories—all attached by plate-clips—or the front fork head with its telephone exchange of tangled wires, or the tank top with its filler caps, petrol valves, tube recesses, tank clips, and oiling apparatus, or the crank case, or the gear box, or the rear hub, or the carrier, we find an utter absence of smooth and shapely surfaces, and a bewildering multiplicity of what Major Matson used to describe as "tiddly bits." Until these are exorcised, our machines must continue to displease the eye and absorb hours when they require cleaning.

Clothing the Naked.

I AM not at all sure that the smooth exterior is not possible. The power unit and its subsidiary fittings are the main problem: so long as the machine is condemned to carry a bristly, spiky, amorphous unit at its centre, no designer will see the point of cleaning up such comparatively simple details as the handle-bar, crank case, and chain cover. Within the last year I have seen a 200 h.p. air-cooled engine with never a fin on its cylinders, and a powerful water-cooled car without any visible radiator. After all, the cooling draught obtained by motoring along the road is contemptible. Its average velocity can hardly exceed 20 m.p.h., and it is disqualified for efficiency—where air-cooled engines are concerned—by the fact that its nature is to impinge on only *one* side of the cylinder. You can get a better draught and a stronger draught by boxing in your air-cooled engine or your water radiator completely, and using a ball bearing fan to suck the air past the fins or the honeycomb, as the case may be. If this is once successfully attempted, the motor bicycle will, so to speak, substitute a neat pair of tailor-made trousers for its present waistband of beads and wire; and, in due course, it would add a bowler hat in lieu of painting its cheeks and sticking feathers in its hair. All of which improvements are ardently to be desired.

Pardon this outburst, gentle reader. It has been thawing to-day: my front mudguard fell off eight miles away, owing to a rusted bolt; and it is "some" cold in my garage. Also, I had been to a dance, and was too lazy to change out of dress trousers: and when Mrs. Ixion saw them laid over a chair back this morning, she said "——— !!!"

Overhead Valves.

I CONFESS to very real disappointment at the obvious decision of the motor cycle trade as a whole to adhere to side valves. In the old days the overhead valve was wisely eschewed because of the risk of fracture: this danger is wholly obviated by modern steels—there are air-cooled aero engines fitted with exhaust valves nearly 2in. in diameter, which never break, although the heads are thin and light. On the technical side there is not one solitary word to be said in favour of side valves, and least of all in connection with air-cooled engines, where a symmetrical section is so invaluable as a preventive of distortion. The real problem in the application of o.h.v. to motor cycle engines is purely practical. The public demand a certain type of engine, and a motor cycle frame offers scant accommodation for the longest dimension of that engine. Overhead valves threaten to foul the middle rail of the frame with vertical engines, and elongate the already over lengthy flat twin. So we see the Rudge people scolloping out their petrol tank to clear an overhead inlet valve, and Mr. Bradshaw mounting

Occasional Comments.—

his 400 c.c. flat twin athwart the frame. Nevertheless, I cannot help feeling that overhead valves will gain ground, as their technical merits outweigh the practical difficulty. After all, there is no great objection to inclining such valves, whilst the use of volute springs shortens the length of the stem: indeed, the latter tip is freely employed to reduce the "swing" of rotary engines.

No More Broken Sidecar Frames!

THE other day I happened to call at a factory which produced many of the sidecar chassis used by the motor sections of the Machine Gun Corps. Scottish Trials have no terrors for this concern. The machine gun sidecar units scaled 11½ cwt. apiece, and practically every item in the original chassis fractured when it was set to transport this load over the roads of France and Belgium. Little by little all the weaknesses were traced out and eliminated, the last to yield being the spindle of the sidecar wheel, for which Vickers finally produced a special brand of 100 ton steel. A director asked me if I would like to try their experimental 1919 combination. We were in an upstairs shop at the time, but a dust-sheet was whipped off, I took my seat, and we curvetted down a chicken ladder and over a devastated area where works extensions were in progress. I can guarantee that this model will be worth waiting for.

Detachable Cylinder Heads.

WHILST making a round of inspection to pick up information about experimental 1919 models, I have noticed that many manufacturers are coquetting with the detachable cylinder head. It is, of course, as old as the hills, and was abandoned years ago because amateur owners experienced difficulty in remaking the joint. It would be absurd to anticipate a renewal of such troubles when thousands of owners succeed in handling the very complicated gaskets fitted to four-cylinder water-cooled car engines with loose heads. The main advantages of the detachable head are three in number, and are here given.

1. It considerably facilitates decarbonisation, especially on big twins, where a big one-piece cylinder can only be cleared if the crank case is dropped.

2. It permits the interior of the combustion chamber to be machined, which retards carbonisation, assists the cooling, and last, but

by no means least, reduces the liability of pre-ignition.

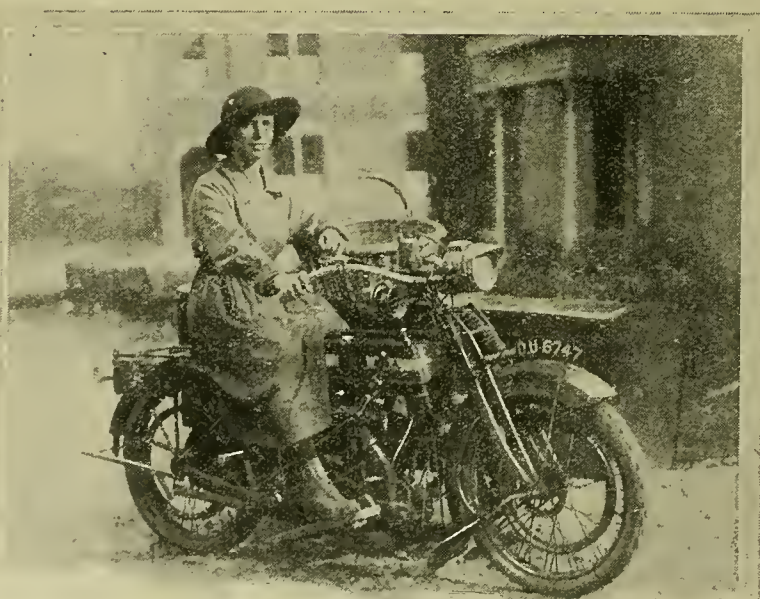
3. If side valves are retained, the construction of the valve chest is simplified. When the valve chest was cast on to the side of the cylinder, a "hot spot" was created on the cylinder wall; and the casting was complex and difficult to machine if an air passage was provided. If the valve chest is an excrescence on a loose head, it is easier to cast and to machine.

In some cases these detachable heads will be secured by dogs or clamps.

High Gear Ratios.

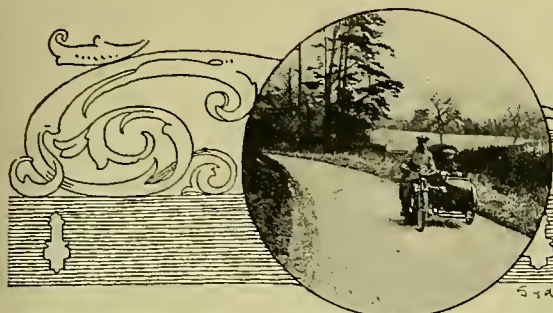
IN this paragraph I rashly challenge two eminent designers, whose pre-war notions, at any rate, ran counter to my own. The Rudge Co. sent us a letter (published on January 30th), in which they drew attention to the fact that their multi-gear gives ratios of 3½-6¼ to 1. For several years the ratios on Mr. F. W. Barnes's Zenith-Gradua gear were limited to a similar range. What I can only regard as a similar heresy popped up in a recent letter, criticising the inclusion of bottom ratios of 14 to 1 in four-speed gear boxes. Admittedly, the high series are suitable for (a) T.T. races; (b) high-speed solo touring; but they are found wanting for (c) the average private owner, and (d) riding in mountainous districts. Given a splendid rider who is an adept at handling and tuning a machine, such mounts are simply delightful; and, therefore, they inevitably obtain considerable prestige. Then the trouble begins. Ignorant amateurs, who are clumsy riders and hopelessly bad tuners, purchase such mounts on the strength of their sporting reputation; and the owner finds his mount an incubus in any really hilly country. Seven out of every ten riders experience extraordinary comfort when they are straddling a gear which will conquer

any hill without the aid of stunt jockeyship. The Brooklands clique will mock at ratios of 12 or 16 to 1. Let them mock. The average owner is a timid and clumsy person, and his engine is usually rather out of tune; give him a double-figure low gear, and he will bless you. Knowledge of this led Mr. Barnes to improve the Zenith from a commercial standpoint by incorporating a chain reduction, and dropping its bottom gear to 11½. For sportsmen who are also mechanics, a 3½-6¼ range is certainly ideal, but this cannot be said of every amateur rider.



Another Midland baker, Mr. S. Jones, has recognised the possibilities of the motor cycle for business purposes, and has his bread delivered by the aid of a B.S.A. tradesman's side-carrier. A load of one hundred and twenty loaves can be taken, and he finds the advantages over a horse and van are numerous, both from the point of view of convenience and of finance.

A Tabloid History of Air-cooling.



MARKED CHANGES IN MOTOR CYCLE ENGINE DESIGN IMPENDING.

By "ROAD RIDER."

THE scientific study of air-cooling was postponed until aeroplanes put a high premium on light engines. Several of the earliest petrol engines produced for road work were air-cooled, notably that of the Leon Bollée tricar. In those days engine design was so bad that even water-cooled engines were apt to run red-hot. The question of weight seemed immaterial—witness the pinions of some prehistoric motor car gear boxes, which look as if they were meant to take the first reduction off a soft water-wheel. So heavy water-cooling systems were clapped on to cars, and if motor cycle engines retained air-cooling it was supposed that 500 c.c. was its limit. As late as 1906 I possessed a $4\frac{1}{2}$ h.p. engine which made its exhaust port glow visibly at night.

Then aeroplanes brought the relation of weight to power into new prominence: and that just at a time when hot-stuff w.c. engines on sporting cars and racers had drawn attention to distortion, piston temperature, valve heats, and other problems relevant to efficient cooling. History does not relate on what lines the designer of the first Gnome engine was thinking. Let us imagine that the sequence of his reasoning was somewhat as follows:

1. The motor car type of engine is too heavy for aviation, and its torque deficient.
2. What parts of this engine can be lightened?
3. The crankshaft, crank case, and water-cooling system are some of the heaviest items.

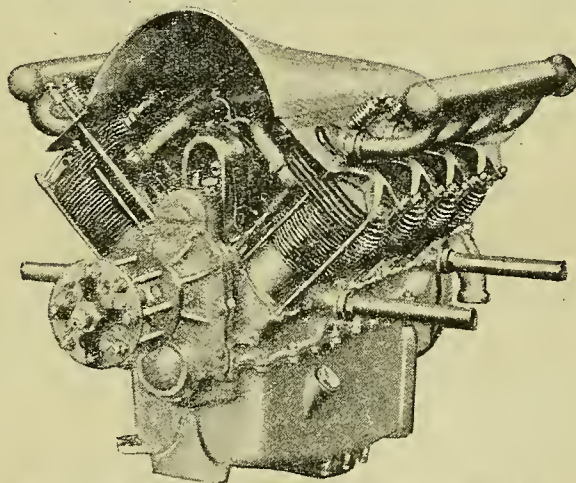
4. If I substitute a starfish outline for a coffin plan I shall lighten the crankshaft and crank case.

5. If I make the cylinders rotate, they may keep cool without the aid of water.

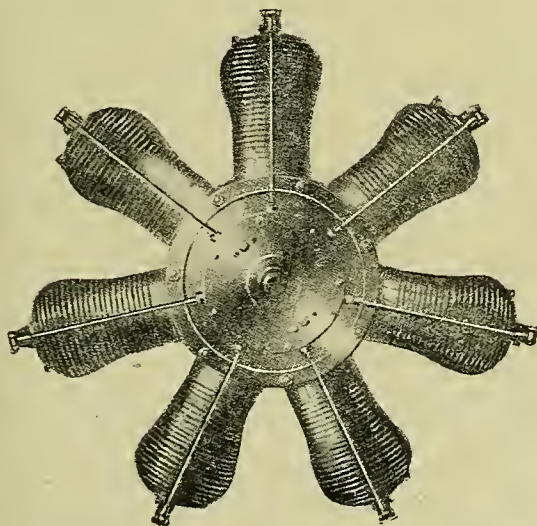
So the original Gnome came into being. It kept cool enough to be usable when it was in a good humour: but at nights, when sighted from another aeroplane, it looked like a dying planet or a gear wheel heated prior to tempering. "Air-cooling no bon for big cylinders!" was the general verdict.

Milestone No. 1. Air-cooling Advances from 8 h.p. to 37 h.p. by dint of the Rotary.

The patient crowd of aviators who wrestled with the early Gnômes soon discovered that their compression became almost non-existent after a few minutes' running. Research showed that *distortion*



An air-cooled eight-cylinder V type aero engine, to which has been added a cowl to assist cooling.



The early type Gnome rotary engine mentioned by "Road Rider."

was the bugbear. What was the use of machining your piston and cylinder to an even .004in. clearance all the way round if five minutes' work swelled the section of each part to an irregular lop-sided polyhedron? One spot on the piston was trying to weld itself into unity with a swollen lump on the cylinder wall, whilst another spot, 2 or 3 mm. away, showed a clearance of .01in. Attempts to restrain this anarchical expansion under heat showed scanty success. Nothing daunted, the imperturbable Gaul discovered that, on the whole, the cylinder expanded away from the piston: so he adopted the flexible "obturator" ring—i.e., an L-shaped brass ring in the top groove, with a conventional ("packing") ring behind it.

A. Tabloid History of Air-cooling.—

which closed the gap as the cylinder bore swelled, and yet created little friction. Pilots were not as grateful as one might have expected. They came in from patrols with crank cases full of pulverised obturators: and they said things. (Incidentally, put an early Gnome cylinder alongside a typical 1914 motor cycle cylinder: and ask yourself which of the two is more calculated to distort.)

Distortion, otherwise uneven expansion, was by now recognised as the real enemy of air-cooling. Immediately a mighty Army of research workers began to grapple with it. Many of these labourers contributed their mite of fact or theory to the campaign. For example:

The leading face of a rotary engine cylinder gets more cooling than the trailing edge: ergo, this is the location for the exhaust valve.

The front side of a naked aero engine gets more draught than the reverse side: ergo, cowl the engine in suchwise as to distribute the draught.

The windward side of an engine gets more cooling: ergo, circumferential conduction round the cylinder walls will help even expansion.

Knobs of metal are the dickens: they make hot spots: à bas the fool designer who retains them.

Castings are *anathema maranatha*, unless machined: and even then the texture of the metal is not too reliable. Saw your chunk of metal across: machine it to limit gauges: and you may know where you are.

Why not run all the engines you have got, and take their temperatures at various points?

Sometimes a cylinder expands away from the piston and you lose all compression. Sometimes the piston expands into the cylinder and seizes. Research with (a) various clearances; (b) different metals might be a good stunt.

Why take the piston rings for granted? They spring outwards, and build up walls of oil resistance as they slide. One designer uses obturators (fig. 1); another employs one ring and a perforated piston (fig. 2); another prefers five rings on an undrilled piston (fig. 3). Some rings are fat, others are thin. Some pistons have waists, others have not. Ought not somebody to go into all this, or are they *all* right?

What about pre-ignition? A red-hot sparking plug or exhaust valve must heat up its neighbourhood. Do all plugs and all valve steels keep equally cool?

Some cylinders have walls as thick as a 7 lb. jam jar: others are of wafer steel, like a safety razor

blade. Some have shallow, coarse fins, like Army bread and butter. Some have deep, fine fins, like knife blades. Some are finned from head to foot: others are naked from the waist downwards. Does it really matter which?

So the great work went on. Locked sheds at experimental factories began to bristle with the weirdest contraptions. Test single-cylinder engines of 50 h.p. Huge wart-like objects swathed in aluminium quoits. Barrels bound round with Bowden brake pull-off springs. Jars sheathed in wavy copper zigzags. Brass hats and No. 8 heads pursed their lips and diffused their hush-hush conversation to intimates. At intervals a sort of thumping bellows was audible behind locked doors. Then perhaps a sound as of two giants tearing linen was heard. Or a few rafters suddenly tilted off the roof, and lumps of metal soared heavenwards in graceful

parabolas. Or the bellows continued, and the brass hat concerned presently mounted another pip. Anyhow, the nett result was:

Milestone No. 2. Air-cooling Advances to 40 h.p. per Cylinder, or 360 h.p. per Engine.

And *stationary* engines at that, gentlemen. Gone for ever, one supposes, is the rotary. No longer need a 300 h.p. engine waste 30 h.p. in overcoming its own wind resistance in still air. No longer need an engine throw out two gallons of perfectly good and very costly oil into the ungrateful atmosphere during every hour. No longer need the ungrateful mixture reach the inlet valve *via* the devious route of crankshaft, crank case, gear box, and inlet pipe. (Methinks a rotary engine's inlet valve must feel like a very fat pug hunting the ghost of a rat round Trafalgar Square.)

Well, that's that. And what about it? We shall presently see very marked changes in the design of motor cycle engines. Do not believe the merchants who tell you that considerations of cost doom us for ever to those knobby cast-iron cylinders which are to modern practice what a Saratoga trunk is to a Whitehall flapper's attaché case. Steel cylinders, machined inside and out, are little more expensive than complex castings with their high percentage of scrap. A modern efficient piston is not necessarily dearer than those prehistoric types best used for door-stoppers. The *principles* of aero engine design are directly and cheaply applicable to motor cycle engines: and a few modifications in their *application* are easily arrangeable.

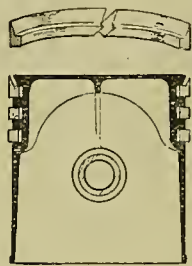


Fig. 1.

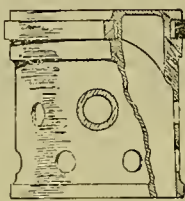


Fig. 2.

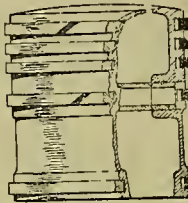


Fig. 3.

BENZOLE AND THE GAS COMPANIES.

In certain districts there have been many complaints about the quality of gas, and the Board of Trade is to be asked by a number of local authorities to rescind the war-time order allowing gas companies to extract benzole from household gas. It has been maintained, however, that after extracting the benzole the difference in the calorific value of the gas is so small as to be

negligible, and that no difference in its illuminating power can be detected if incandescent burners are used. Needless to say, the authorities who desire the cancellation of the order are in the minority.

The output of benzole from this source last year was stated to have been 6,000,000 gallons, most of this being used for munitions.

Motor Cycle Design and Construction.

Notes on a Paper read before the Graduate Section of the Institution of Auto. Engineers.

A DISCUSSION upon general current motor cycle design and construction took place at the meeting of the Graduate Section of the I.A.E. in Coventry on the 4th inst., when a paper was presented by Mr. Romyns.

Many important points were introduced in the paper and in the subsequent discussion.

The general adherence to push cycle design in frame construction was criticised, together with the inefficiency of steering head designs, and the too flimsy bolts. The important feature of accessibility was taken up from many viewpoints, and American machines came in for a great deal of criticism on this score.

Whether taper rollers or adjustable bearings should be substituted for plain ball bearings in steering heads and hubs elicited the reply that there is no such thing as an adjustable roller ball bearing, as wear is not uniform, and any adjustment made is only a compromise. Also, if mud has access to bearings it makes no difference what type they are.

Shaft drive was not thought to be prohibited on account of cost, but rather that public opinion does not demand it.

Unit construction of engine and gear box was advocated, but a suggestion was made that they should be separate castings bolted together, after the manner of car units, to allow of individual removal from the frame.

The use of aluminium pistons was deprecated for ordinary use, as they are liable

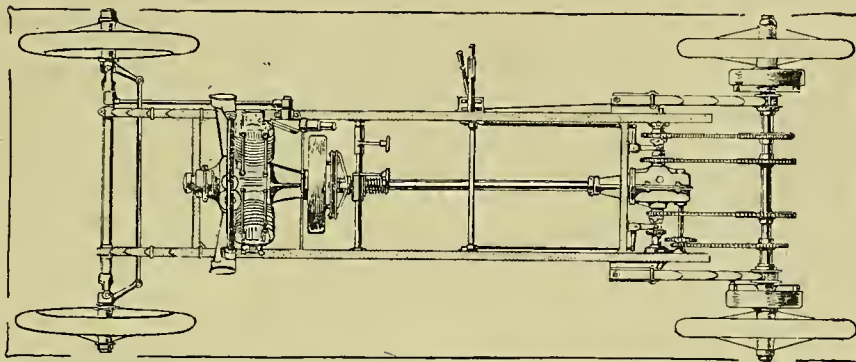
to expand permanently, and the excessive clearance necessary causes piston slap. Also the excessive heat of the motor cycle engine reduces the piston to a semi-plastic condition, and also causes scoring of the cylinder walls.

The use of stainless steel was advocated for nuts and bolts, particularly in exposed positions such as on mudguards. This steel, by the way, is of very good quality, approaching that of B.N.D.

The old question of utilising the crank case as part of the frame was condemned by the author of the paper, but one or two members did not agree with this view,

principally on the grounds that it was necessary to have the metal there for oil-retaining purposes, and, as it is amply strong enough to take the stresses imposed by the frame, it would be mere waste of metal and unused weight if it were not made use of in this way.

Mudguarding was dealt with by a member who has experimented considerably in this direction, and he said that the only way entirely to obviate mud splashing by the front wheel is to bring the guards within 8 in. of the ground, and provide extensive lateral side flaps, and enclose practically the whole wheel.



The chassis layout of the 1919 G.N. cycle car, which embodies final drive by four chains from countershaft to rear axle. Note the engagement of the "reverse" by means of a sliding pinion. A description of the G.N. cycle car appeared in *The Motor Cycle* of Jan. 23.

Readers' Reports of the State of the Roads.

Particulars from South-eastern, Northern, and Midland Counties.

FURTHER details are to hand concerning the road conditions in various districts, as follow: The Westerham Road from Bromley is similar to those in the late battle zones, and accidents are of daily occurrence. The Sevenoaks Road between Bromley and Farnborough is nearly as bad.

The Folkestone coast road up to two miles out from Dover boundary is very bad, and dangerous for motor cycles. An alternative route is through West Hougham and Capel-le-Ferne. Leave Dover by Elmsvale Road; or, leaving Folkestone by Black Bull Road, which is in poor condition, go along the Alkham Valley. The Dover-Canterbury road is good, so is the Dover-Sandwich road. The road between Dover and Deal is rough in places, especially near Dover. Sandwich-Ramsgate road past Richborough Camp is very good, but closed to non-permit holders. On the Canterbury-Folkestone road via Denstone and Hawkinge, the last three miles into Folkestone are very bad indeed. Alternative route by Kingstone, Barham, and Elham, or the Canterbury-Sandgate-Hythe road (turning left after leaving Lyminge). The roads from Canterbury to Ramsgate and Margate are somewhat bumpy.

The road to Newhaven from Lewes, through the villages of Ilford, Rodmell,

and Piddinghoe, is in a terribly bad condition. Tourists are therefore advised to pass through Beddington and Heighton, which is not a main road, but better than the other.

A correspondent sends us the following particulars of the roads radiating from Doncaster:

NORTH.—The Great North Road to Darlington, Durham, Newcastle, and Edinburgh: Good condition with the exception of two or three miles after passing Wentbridge (eleven miles from Doncaster) and short lengths near Micklefield, about twenty miles from Doncaster. After passing Braham the road is good. The North Road to York (via Tadcaster): Fairly good to Tadcaster, very bad from Tadcaster to York. North Road to York (via Selby): Fairly good the whole way.

SOUTH.—The Great North Road (south of Doncaster to London): With the exception of a mile near Rossington Bridge (three miles from Doncaster), good. From Doncaster to Ollerton and Notingham, very good condition generally.

EAST.—The road to Gainsborough, Louth, etc., excellent from Bawtry onward. The road into Lincolnshire to Scunthorpe, Brigg, and Grimsby (via Hatfield and the Keadby New Bridge), fairly good straight forward from Belton via Beltoft to Althorpe; the "Tween

Rivers Road" very bad, the whole width of the road having been stoned without being rolled.

WEST.—Doncaster to Leeds (via Pontefract), fairly good to Pontefract, but bad forward. Doncaster to Leeds, Bradford, and West Riding towns (via Wakefield), fairly good to Wakefield, but bad forward throughout the whole of the manufacturing area. Motorists going beyond Leeds and Bradford are advised to travel by the Great North Road to the thirty-mile post (three miles south of Wetherby) and turn left (via Collingham, Harewood, and Arthington) for Ilkley, Skipton, Settle, Windermere, etc.

DUKES RIVERS ROADS.—The Lime Tree Avenue road deplorable, owing to timber waggons having cut it to pieces.

Ireland.

Particularly bad pieces of road in the counties of Down and Antrim are as follow:

DOWN.—Bangor to Newtownards; Newcastle to Kilkeel; Hilltown to Rathfriland; Belfast to Lisburn; Newtownards to Portaferry; Knock (Belfast) to Dundonald; and Bangor to Ballyhalbert.

ANTRIM.—Belfast to Antrim; Belfast to Carrickfergus; Kilrea to Portglenone; Whitehouse to Mossley; and Ballymena to Antrim.

Why New Models come through Slowly.

What the Manufacturer has to Contend with at the Present Time.

MOTOR cyclists are freely engaging in a double grumble just now—first at the prices which manufacturers are asking, secondly at the fact that three months have elapsed since the Armistice, and few but pressmen have as yet seen a single post-war model. High prices have already been justified in these pages, and that convincingly. Delays are equally excusable. A maker's first anxiety in these days is to keep together a staff which he has recruited with much trouble in the past. The public do not understand how delicate a matter it is to build up a first-class *personnel*. It used to be an axiom that first-class motors could only be built in Coventry: skilled mechanics now congregate in many other districts, but they are shy birds, and easily frightened away from a slack factory. So munition contracts are kept running on a reduced scale; and, if they anchor down the staff, they also hamper works reorganisation.

The Obstacles.

Then the new 'bus has to be designed and several experimental machines tried out. One manufacturer at least has got as far as sending a squad round a six days' course in the hands of some blithe boys who will do their best to break them up and discover any latent weakness. Sometimes the experimental 'bus is a lucky shot. Everything comes out dead right at the first essay, and the works staff have merely to select a prettier colour for the lining round the tank panels, or to cut the cost of an expensive bit of machining. More often something is radically wrong—cost, weight, springing, gear changing, or engine performance. Weeks pass quickly in the necessary experiments.

At last the design is finally approved, and the works begin to hum with actual preparations for manufac-

ture. The key to the position lies in the drawing office. Master drawings of every detail are made on tracing cloth, and blue prints are taken for the use of the hands. Simultaneously, the "alleys" in the shops are being replanned. Time and money are wasted if the finished machine emerges opposite the canteen entrance 500 yards away from the running shed, or if a quarter of a mile separates the erecting shop from the points at which complete engines and gear boxes appear. Useless machinery is being hustled out of the place, now that the last cartridge or tank or machine-gun has been delivered. The staff hustler is exhausting all his tact and profanity upon the railway company and the machine tool firms to get his new equipment delivered. The buyers are trying hard to get definite price quotations and preferential delivery dates from all the firms who supply raw material—steel, tubes, carburettors, magnetos, chains, enamel, and a myriad other necessities. Patterns for castings and jigs for ensuring economy and accuracy in repetition work are being frenziedly designed and made. The financial department are tearing their hair and wringing their hands. In these days of industrial unrest, shipping shortage, and Government control, few people dare say what anything will cost or when it can be obtained. Just when everything begins to run smoothly a section of the hands strike for a twenty-hour week or an extra £1 per day. No wonder that in those rare cases where the experimental 'bus was passed for production last November the first machine may not reach its lucky buyer till June. Pity the poor manufacturer. Never was any business man beset by so herculean a task. He deserves our sympathy rather than our criticism.

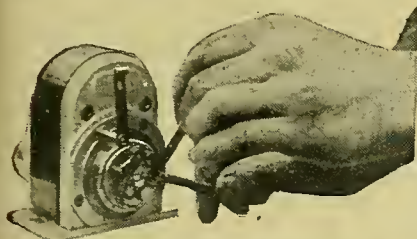


A motor cycle as an aid to the sport of sledging. A snapshot taken during the last downfall of snow.

1919 IMPROVED DESIGNS.

A NEW PATTERN C.A.V. MAGNETO.

WE recently inspected a new pattern C.A.V. magneto—a beautifully made and well-finished little instrument. The type illustrated is suitable for flat twin motor cycle engines. So far as its working parts are concerned, it is in no way different from other practically similar models turned out by Messrs. Vandervell and Co., Warple Way, Acton Vale, London, W., but it will be noticed that it is slightly different in shape, the magnets being of true horse-shoe form, and not rounded as in previous models. The contact breaker which the firm has adopted is simple and ingenious. As there is no fibre bush to swell and no rocking arm to stick, it can be seen at once that it possesses advantages of its own; and these two items, which give trouble under certain conditions, are dispensed with by



A new pattern C.A.V. magneto, showing how the platinum points are adjusted.

mounting the moving platinum point on an L shaped flat spring, the upper and curved end of which comes in contact with a loosely mounted roller of fibre. This in turn comes in contact with the steel segments on the contact breaker ring, which thus force back the spring, causing the points to separate.

Two tools are supplied with the magneto—one an ordinary spanner with gauge for adjusting the platinum points, and a tiny box spanner for turning the end of the screw on which the adjustable point is mounted. The method of adjustment is shown in the illustration.

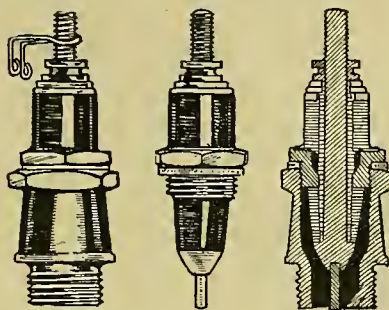
K.L.G. MOTOR CYCLE PLUG DEVELOPMENTS.

A FEW months ago a reference to K.L.G. sparking plugs appeared in this journal. At that time the hand of the Censor lay heavily upon articles of this kind, but we are now able to describe the plug more fully.

As it was originally made for air-cooled rotary aeroplane engines, there can be little doubt that it will stand the temperatures encountered in a motor cycle engine.

A good idea of the construction of the plug may be gathered from the illustration, which shows three views. That on the left is an external view of the plug, which, it will be noticed, has no terminal screw, but in its place is a neat little wire clip, which is instantly detachable, and every bit as effective as the more clumsy

and more easily lost screw. The central view shows how the interior portion of the plug can be detached from the body, enabling the portion which projects inside the combustion chamber to be cleaned.



Exterior and sectional views of the K.L.G. plug.

The right hand view shows a section of the plug, and incidentally the robustness of the central electrode, which is of nickel steel and has a pure nickel end. The central electrode is wrapped in mica, and this wrapping is surrounded by numerous mica washers which are hydraulically compressed into position.

These plugs are now to be sold by the Robinhood Engineering Works, Ltd., Newlands, Putney Vale, S.W.15, at a moderate price.

Not long before fighting ceased a D.R. wrote to the Robinhood Engineering Works, and related how he had searched a derelict Boche aeroplane for souvenirs, and had chosen for himself one of the plugs. This he fitted to his motor bicycle, and thinking all the time that brother Boche, whatever other faults he might possess, was no bad judge of plugs, he thought one day to examine it more closely, and then espied the letters K.L.G.7. It was plain, therefore, that Fritz had originally taken the plug from a British machine brought down in his lines.

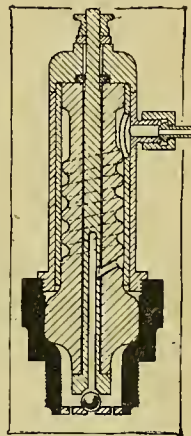
THE C.C. SPARKING PLUG.

MENTION has already been made in this journal of the C.C. sparking plug, but since that reference it has undergone considerable alteration. It may be remembered that the idea is to draw a minute quantity of mixture from the induction pipe, past the ends of the electrodes, and this cools them and keeps them continually clean. It also serves to prime the spot which needs it most—the place where sparking occurs.

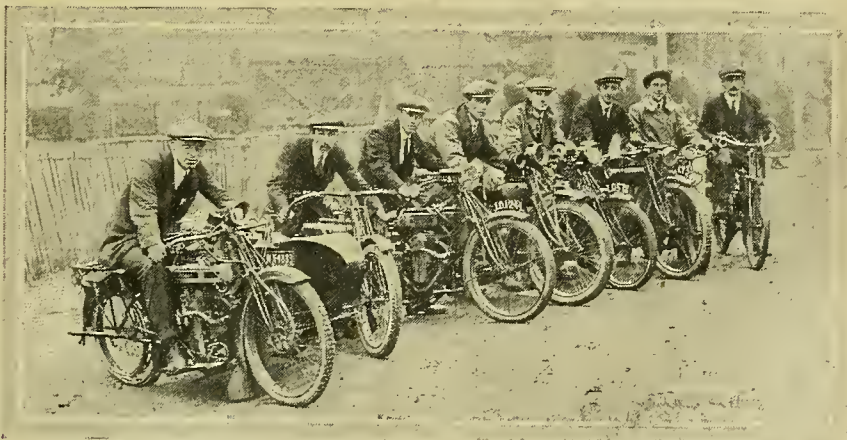
The latest form of C.C. plug possesses an insulator in two portions, consisting of a porcelain cap, and a central portion on which are moulded a series of spirals. The upper portion of this insulator is enclosed by means of a brass casing. The lower portion of the central electrode is hollow, beneath the concave end of which is a small perforated plate on which rests a steel ball.

Projecting from the upper portion of the plug is a small union intended to be connected to the induction pipe, or, in the case of two-stroke engines, to the transfer passage. On the suction stroke a minute quantity of mixture is drawn through the tube and carried round the spirals moulded in the insulator, and, passing through a hole into the hollow portion of the electrode, issues through the spark gap, which is formed by the ball and the hollow upper electrode, at the moment when the spark occurs.

On the firing and compression strokes the ball is held against its seating.



The improved C.C. sparking plug.



A group of workers mounted on motor cycles at the K.L.G. plug factory; all these are enthusiastic motor cyclists. (In November, when an article on K.L.G. plugs appeared, this photograph was submitted to the Censor who, for some unfathomable reason, refused its publication.)

1919 Improved Designs.—

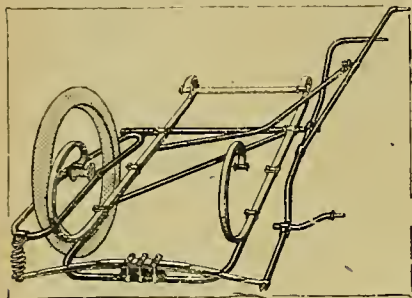
A trial of this plug on two-stroke motor cycles, resulted in great improvement in the running.

The plug is manufactured by the C.C. Sparking Plug Co., 145, Queen Victoria Street, London, E.C.4.

A SPRING SIDECAR CHASSIS DESIGN, FROM AUSTRALIA.

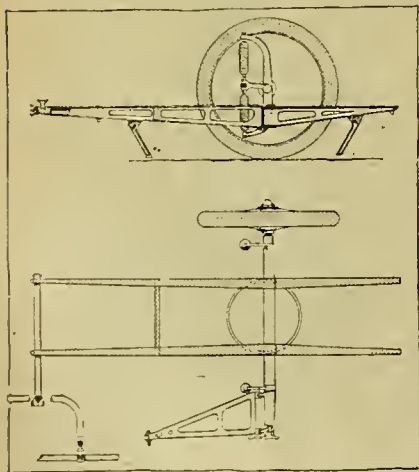
THE springing problems connected with overseas machines are, or should be, of interest to the British designer, not only as an indication of what is required in the Colonies, but as being of assistance in solving the suspension problems of home models.

The sidecar chassis design illustrated emanates from Australia. Perhaps the

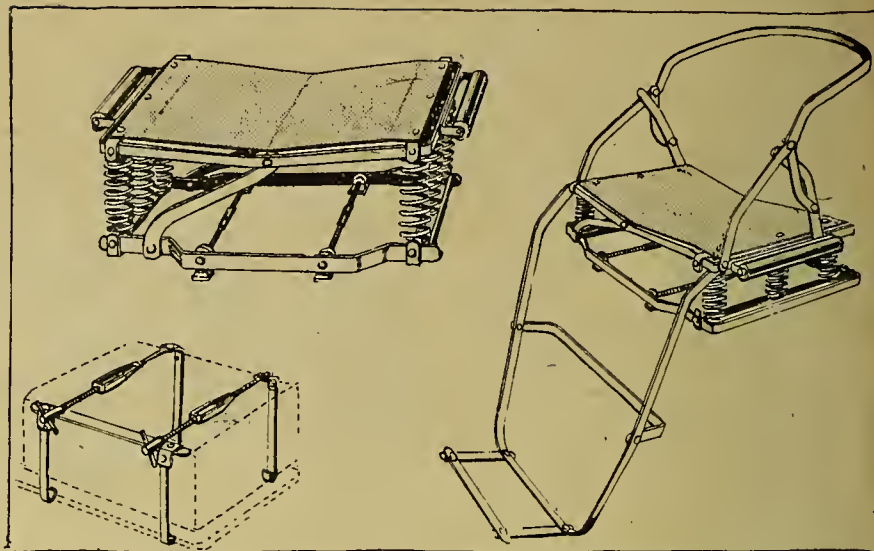


An Australian sidecar chassis, embodying a springing device of unusual design.

most interesting feature is the system of transverse springing at the rear. The wheel cradle is hinged at the forward end and the smaller road shocks are taken up by the coil spring at the rear end. This coil spring is in turn attached to one end of the transverse semi-elliptic spring. The opposite end of the latter is hinged to the main side member, thus insulating the machine to



The chassis of the Gonther sidecar, which was referred to in last week's issue of *The Motor Cycle*. It is constructed in the main from steel pressings with welded joints, giving great strength with lightness. The main attachment is also of pressed steel. The body is intended to be sprung at the rear only, and attached to a swivelling bar at the front.



The Tan-Sad sprung pillion seat is shown with and without the addition of a foot and back rest. The petrol-can grip is formed of turnbuckles and linked metal strips.

a large extent from side stresses. Large scroll springs are provided for the further insulation of the body. The wheel has a knock-out axle to facilitate tyre repairs.

THE TAN-SAD PILLION SEAT.

WHILST we do not wish to encourage the dangerous practice of carrying a passenger on the carrier of a solo machine, it is obvious that there is little objection to the carrying of a third person on a properly-designed carrier seat of a powerful sidecar combination; and it is principally with this object in view that the Tan-Sad Co., 46, Weaman Street, Birmingham, are developing their series of spring carrier seats.

The general design has been altered to give a better cushioning effect, three coil springs being used at front and back—six in all. The two centre springs can be removed, when required for lightweight use only. A link action in the frame gives a parallel movement as the springs are compressed.

Upholstery has been avoided, and a plain metal seat provided, curved to a comfortable shape, upon which a cushion may be strapped if desired. Wooden handles may be added as further security for the rider, and for a solo machine a jockey type of stirrup gives support for the passenger's feet. When in use with a sidecar, with the passenger sitting sideways, a footrest and backrest can be fitted.

IMPORTANT NOTICE.

GOODS MADE IN GERMANY.

The proprietors of this journal, being fully in accord with the recommendations agreed upon at the Paris Economic Conference, give notice that they will not permit the advertisements of new goods manufactured in enemy countries to appear in this publication.

— ILIFFE & SONS LTD.

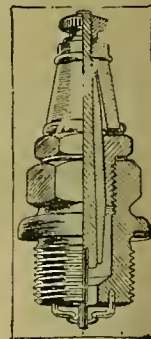
A can of petrol may be firmly fixed on the seat, when not occupied by a passenger, by the use of a patent grip.

The fixing of this pillion seat to the carrier of the motor cycle has not been altered, the same principle of right and left-threaded rods operating clamps in the underframe being employed.

The intention of the firm is not to market a particular series of models, but to leave it to the purchaser's wishes as to how, and with what, he will fit up the seat. Prices are not definitely settled yet, but will be quite reasonable. Production is being commenced at once, and delivery should be possible in a few weeks' time.

A PLUG FROM THE U.S.A.

WE have received particulars of a plug with separable electrodes which, although it has been on the American market some time, is not so well-known over here. The insulation is composed of layers of mica wrapped round the central electrode, the whole being compressed into a hardened steel shell, which is screwed into the main body of the plug, the joint being rendered gastight by the interposition of a copper-asbestos washer. The plug body is of case-hardened steel, with the washer permanently attached. The electrode is bent in the form of a semicircle round the central "point," and fixed at both ends. The porcelain collar merely serves to protect the mica insulation. It is hoped to put these plugs on the English market at an early date, at a price of about 4s. 6d. The British distributor is Mr. Louis N. Cooper, 117, East Road, City Road, London, N.



The Benton (U.S.A.) plug.

SPRING OR RIGID FRAMES?

Final Article on the Various Points of Specification as voted for by Readers of "The Motor Cycle" in the Recent "Which Type" Referendum.

IN the issue for January 23rd we gave the proportionate voting of readers on types and systems of transmissions, while previous articles have dealt with engine types and sizes and their equipment.

The voting on the various types of gears and clutches omitted from the article in that issue was as follows:

TYPES OF GEARS.

	Solo.	Sidecar.
Epicyclic gears	6% ..	5.8%
Sliding gear	37.7% ..	35.8%
Dog clutch	51.2% ..	51.9%
Expanding ring	5.1% ..	6.5%

TYPES OF CLUTCH.

{Dry plate	69.3% ..	67.6%}
{Wet plate	30.7% ..	32.4%}
{Single	35.1% ..	18.3%}
{Multi	64.9% ..	81.7%}
Cork inset	22.6% ..	21.9%

CLUTCH CONTROL.

Hand	30.5% ..	23.5%
Foot	4.2% ..	10.7%
Hand and foot	65.3% ..	65.8%

The following figures give the results of the voting on other details of specification. The first of these is the question of spring frames, from the figures regarding which it will be seen that *The Motor Cycle* campaign in favour of spring frames has borne good fruit, and that the demand for this type of frame from both solo and sidecar class of rider is most insistent.

	Solo.	Sidecar.
Rigid frames	21.1% ..	15.2%
Spring frames	78.9% ..	84.8%

It is interesting to note that those who did not favour spring frames specified some means of insulating the rider from road shock, such as the Edmund and Bat semi-spring frames or a spring saddle-pillar. The voting on the three systems affecting riding comfort only, as distinct from complete springing of the machine, was as follows:

	Solo.	Sidecar.
Conventional saddle	77.2% ..	70.7%
Sprung saddle-pillar	15.5% ..	18.5%
Semi-spring frame	7.3% ..	10.8%

The popularity of the diamond frame in both classes is very clear, but from the voting one gathers that this should be of the duplex type.

DIAMOND OR OPEN DESIGN.

	Solo.	Sidecar.
Diamond	88.4% ..	85.7%
Open	11.6% ..	14.3%

OTHER DETAILS OF DESIGN.

Loop design	25.1% ..	27.7%
Girder design	32.5% ..	27.6%
Duplex design	42.4% ..	44.7%

Handle-bars.

Considering the known popularity of the semi-T.T. handle-bar, it is not surprising that in both classes this type has a distinct lead, while the D.R. type comes second in the solo group.

	Solo.	Sidecar.
Upturned	13.6% ..	30.9%
Flat	8.3% ..	19.7%
Dropped	2.3% ..	2.2%
Semi-T.T.	58.6% ..	39.7%
D.R.	17.2% ..	7.5%

Present-day brakework has been the subject of criticism many times, and on the voting on this point makers no doubt will have material for thought, as the most conventional type of front brake is the one scoring the lowest number.

FRONT BRAKES.

	Solo.	Sidecar.
In V rim	49.6% ..	43.9%
Conventional shoes on rim ..	13.4% ..	8.3%
Expanding	21.7% ..	39.6%
Contracting	15.3% ..	8.2%

REAR BRAKES.

Inside V rim	28.8% ..	14.8%
Outside of V of rim (conventional)	17.1% ..	11.9%
Expanding	36.7% ..	57.4%
Contracting	17.4% ..	15.9%

The demand for quickly detachable wheels is most emphatic, no less than 91.6% voting for them in the solo class and 96.8% in the sidecar group.

On the question of lighting, the majority favour the dynamo lighting set, the conventional gas generator coming second. The voting was as follows:

	Solo.	Sidecar.
Dynamo	65.9% ..	67.6%
*Battery	6.5% ..	7.7%
Generator	20.0% ..	14.5%
Gas cylinder	7.6% ..	10.2%

This concludes the results of the voting, and we think both trade and rider will have learnt something of value from them. Whether we shall see machines on the lines set forth by our readers staged at the next Olympia Show remains to be seen. We know that quite a number of designers have followed the plebiscite very closely, and, unable to wait for the results to appear in *The Motor Cycle*, have telephoned us concerning various points in order that they may give them consideration for inclusion in the new models they are now designing.

In conclusion, we thank the thousands of readers who have sent us their ideal specifications. In subsequent issues we hope to deal with the hundreds of suggestions for the improvement of motor cycles, which formed the second part of our competition.

*Of these a few specified the F.R.S. system of lighting from the magneto, with a dry battery in reserve for use when the engine is not running.



TIME TO LIGHT LAMPS

GREENWICH TIME.

Feb. 13th	...	..	5.38	p.m.
" 15th	...	...	5.42	"
" 17th	...	...	5.45	"
" 19th	...	...	5.49	"

Prices.

Despite the high prices of 1919 motor cycles, manufacturers report a "brisk" demand.

Handle-bar Muffs.

This is the time of the year when handle-bar muffs add to the comfort of riding, yet very few are seen in use.

Police Traps.

We are informed that there is a trap working outside the Hotel Cecil, in the Strand, London, where attention is paid more especially to number plates, to see if they are defaced in the daytime or not illuminated at night.

We also hear that a further trap is working in Sloane Square.

Munitions and Motor Cycles.

The combination of three large all-British engineering firms to produce the Angus-Sanderson car sets an example to the motor trade. It is a policy discussed throughout the war to meet foreign competition. Only by greatly increased outputs and specialisation can the price of a car or motor cycle be reduced very considerably, and it will be interesting to see if the policy is adopted by a fusion of motor cycle manufacturers.

Drivers for Women's Legion.

Motor drivers are still needed in connection with the Women's Legion. An enormous number of women have received motor driving training at the various schools, and it is not too late for them to apply this knowledge to useful account. Particulars as to how to join the Army Service Corps may be obtained from the Commandant, Women's Legion Motor Drivers, 15, Pall Mall East, S.W.

The Industrial Reconstruction Council.

The fourth lecture of the series arranged by the Industrial Reconstruction Council will be held in the Saddlers' Hall, Cheapside, E.C.2, on Wednesday, February 19th. The chair will be taken at 4.30 by the Right Hon. Lord Leverhulme, and a lecture on "The Responsibility of Trade Unions in Relation to Industry" will be delivered by the Right Hon. J. R. Clynes, M.P. Applications for tickets should be made to the Secretary, I.R.C., 2 and 4, Tudor Street, E.C.4.

SPECIAL FEATURES

TABLOID HISTORY OF AIR-COOLING.

SPRING OR RIGID FRAMES?

WHY NEW MODELS COME THROUGH SLOWLY.

Gloves.

Gloves that fit tightly upon the hands are as bad as no gloves at all, at this time of the year.

How they "Collect" the Motor Cycle Tax in France.

The French Chancellor of the Exchequer has just issued an illustration of the official plate for 1920, which must be carried on all French motor cycles, either on the steering head or the diagonal down tube of the frame. It is depicted in the accompanying reproduction, which is the full size of the plate, measuring 2½ in. wide x 1½ in. deep.



Sidecars and solo motor cycles provided with more than one seat will have to carry two of these plates, the second of which must be fixed above, below, or alongside the first. This plate is the official receipt for the annual tax, and there is therefore no doubt about it having been paid. A plateless machine is an advertisement of non-payment.

Canadian Roads.

The Government of Quebec has spent approximately £3,000,000 on roads in five years. In 1907 the Quebec Government and municipalities systematically maintained 1,000 miles of highways. This total had jumped to 18,000 miles in 1916.

The British Middleweight Machine.

After the experience of U.S. despatch riders with British solo machines, there is a tendency in America for consideration of the "middleweight" type of machine on the lines of the British 4 h.p. single. A writer in the American *Motor Cycle and Bicycle Illustrated* states: "British middleweights, are splendid machines but expensive."

The Scottish Demand.

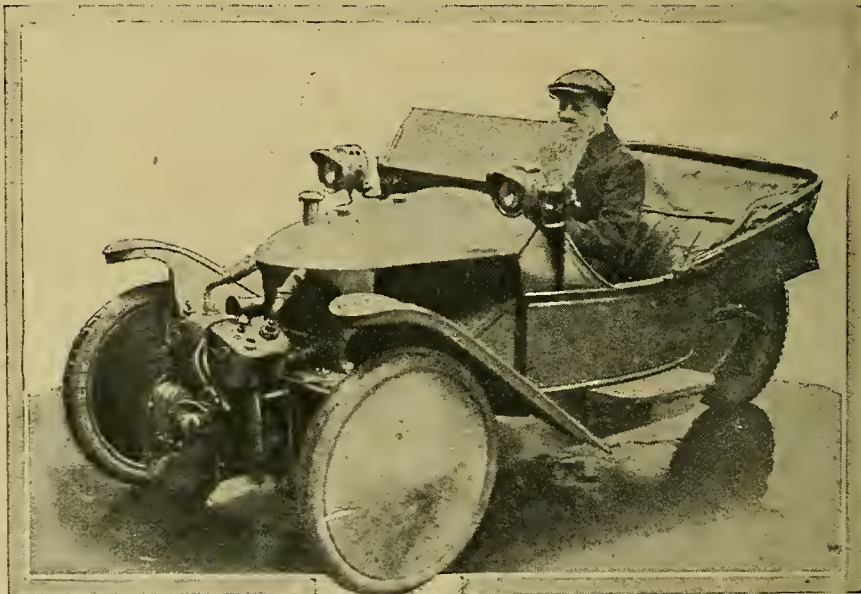
Like most farmers, those in Scotland have done well during the war, and practically every farmer one meets in the Lowlands, states his intention of purchasing a car when conditions relax somewhat.

"They will all buy Fords," sighed a garage owner to our representative.

"What about sidecar outfits and cycle cars?" enquired the latter.

The garage man shook his head. "They know Fords," he said, "but they regard everything else as complicated."

Yet there is nothing simpler than the modern motor cycle, if only this fact were realised.



In view of the high price of second-hand motors, it is refreshing to hear of anything selling cheaply. A reader of *The Motor Cycle* bought the Morgan illustrated for £82 10s. It is a 1914 model, with J.A.P. water-cooled engine, disc wheels, electric lamps, accumulator tools, etc., and in excellent condition. He has had offers for it of £110 and £120.

Ivy Two-stroke.

Ivy de Luxe two-strokes for 1919 range in price from £42 to £53, the former being a single gear model and the latter the I.O.M. T.T. with two-speed gear.

The British Motor League.

A new motoring organisation has made its bow to the public—The British Motor League. The new league intends to offer the same kind of legal assistance to its members as do other organisations—but it is to be more “democratic.”

Pressed Steel Frames.

The number of pressed steel frames and the interest taken in the subject is rather noticeable just at present. “Mechanicus,” contributor of the article “Sidecar Design,” May 23rd, 1918, suggesting a pressed steel frame for a four-cylinder sidecar unit, writes us that he is particularly gratified to notice the advances that are being made in the direction of pressed steel frames, and hopes to see his suggestion for the sidecar combination adopted very shortly by a firm of motor cycle manufacturers.

The Cyclecar Club.

A special general meeting of the Cyclecar Club will be held towards the end of March, and there will be several interesting items on the agenda. It is proposed that the club, which will be re-started as from April 1st, will be known as the Junior Car Club, that its light car members will be affiliated to the Royal Automobile Club, and its cycle car members (owners of three-wheeled vehicles) will be affiliated to the Auto Cycle Union. A list of events, runs, and other fixtures will be arranged for 1919, and a design for a new badge is to be prepared.

INDEPENDENT OF TUBES AND BUSES.

There was quite a noticeable increase of motor cycles and sidecars in the City during the strike last week, and the utility of the motor cycle was exemplified in no uncertain manner judging by this loaded sidecar.

THE DISPOSAL OF ARMY MOTOR CYCLES.

At the time of going to press very little information can be added to our previous statements regarding the disposal of War Office motor cycles. The Surplus Government Property Disposal Board appears to be organising, and has appointed seventeen controllers to deal with the different classes of property. Lt.-Col. C. V. Holbrook is the controller in charge of the Mechanical Transport section. In accordance with arrangements made with the various Government Departments concerned, no surplus property will in future be disposed of except through, or by arrangement with, the Disposal Board. A special section is being set up to deal with sales to neutral countries.

The Velocette.

The prices of the Velocette given in our Buyers' Guide have been withdrawn.

Price Fixing.

Concerted price fixing by any industry is regarded as a restraint of free competition in the U.S.A., and therefore illegal.

The Latest Service Journal.

The Albatross is the title of the newest Service newspaper. As its name denotes, it is an Air Force production, and its home is Blandford Camp, the principal R.A.F. depot. It is edited, printed, and published at that delightful spot so endeared to both officers and men of the R.A.F., and the first number is a most promising one.

Morgan Prices.

1919 Morgans have been raised in price slightly above the figures shown in our recent Buyers' Guide. The sporting model is now £145; the G.P. £150; the De Luxe a.c. £150, w.c. £160.

The A.C.U. Six Days' Trial.

Although nothing has yet been officially announced regarding the A.C.U. Six Days' Trial, it may be taken as practically certain that this will be held next August, and that the course will be in the Wye Valley district. No doubt a capital series of day trials can be arranged radiating from, say, Chepstow, and a great deal of new ground to A.C.U. competitors could be included. Thirteen years ago the Six Days took in a portion of South Wales.

United Action.

A conference of representatives of all motoring organisations has been called for to-morrow (Friday) by the Motor Legislation Committee, 83, Pall Mall, of which Mr. Joynson-Hicks, M.P., is chairman, to consider the best means of removing the war restrictions on motor vehicles, the restoration of roads and bridges, and the provision of a plentiful supply of fuel at reasonable rates.

The Committee is opposed to the placing of the roads and railways under the proposed Ministry of Ways and Communications, and advocates the reconstruction and strengthening of the Road Board.

This united action has been strongly advocated by this journal and *The Autocar*.

French Tariff.

The French Government is still keeping the 70% *ad valorem* tax against the British motor trade, and French manufacturers say they need this protection for at least another twelve months.

Import Duty.

The authorities consider that by protecting the British motor industry by means of a tariff against foreign imports, skilled mechanics in the R.A.F. and R.A.S.C. will be given a better chance of finding employment.



CLUB NEWS.

Nottingham and District M.C.C.

The meeting of this club arranged for February 14th, and notified in last week's issue as a committee meeting, is to be an extraordinary general meeting, to which all local motor cyclists are invited.

South Birmingham M.C.C.

A preliminary meeting of this club was held at headquarters, "The Mermaid Hotel," Stratford Road, Birmingham, on Monday evening, February 3rd.

It was decided to call a general meeting of the club on Thursday, February 27th, at 7.30 p.m., and all district motor cyclists are invited to attend.

Birmingham M.C.C.

At a committee meeting of the B.M.C.C. it was decided to hold the opening run on April 5th, to Stratford or Evesham. All past and present members, with their motor cycling friends, are invited to participate in this social run.

Strictly speaking, this will not be a competitive event, but it is intended to award prizes and souvenirs to those taking part. Full particulars will be announced later.

The competition programme for 1919 will be a most attractive one, and motor cyclists, both experts and novices, will be well catered for. All those who are desirous of becoming members should communicate with the hon. sec., Mr. W. H. Egginton, 76, Earlsbury Gardens, Birchfields, Birmingham.

Essex M.C.

It has been decided to hold the annual meeting of the above club in London on March 4th; the actual venue will be announced later.

An active and attractive programme is being arranged for this year, and will include events which have been so popular in past years. The club is financially in a very strong position, having about £200 in hand.

The hon. secretary, Mr. D. S. Kapadia, Algers Road, Loughton, Essex, is anxious to hear from old members still in the Forces, and also from prospective members.

The attention of members of the club using the district of Woodford, Snarebrook, etc., is called to the very active police supervision that is now going on in this district, motor cyclists being stopped in several places.

The Motor Cycling Club.

It has been definitely decided to hold the annual opening run to Brighton, which has not been held since 1915. It is expected that this popular gathering will be well attended. Further details will be published in due course.

It has also been decided to hold the usual M.C.C. Easter tour, concerning which there will be a further announcement.

It has been decided to hold, in the middle of March, a smoking concert for members of the M.C.C. and their friends. Newly elected members are reminded that they are liable for the entry fee of 5s. and subscription, which will be demanded when competitions begin, not exceeding one guinea. Hon. sec., Mr. Southcombe May, 15, Endsleigh Gardens, London, N.W.1.

Club Dates.

MEETINGS.

Feb. 13th.—Bolton and District M.C. General, Swan Hotel, Bolton.

Feb. 14th.—Nottingham and District M.C.C. Committee, Welbeck Hotel, Nottingham.

Feb. 21st.—Sutton Coldfield A.C. Annual.

Feb. 26th.—York and District M.C.C. General, York Station Hotel.

Feb. 27th.—South Birmingham M.C.C. General.

March 4th.—Essex M.C. Annual.

March 22nd.—Auto Cycle Union, General, Birmingham.

EVENTS.

April 5th.—Birmingham M.C.C. Opening Run to Stratford or Evesham.

April 5th.—M.C.C. Opening Run to Brighton.

April 21st.—M.C.C. Easter Tour.

April 21st.—Dublin M.C.C., Dunlop Cup Reliability Trial.

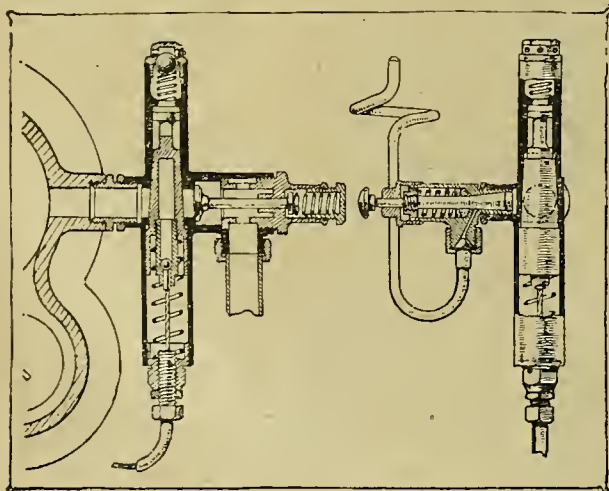
June 9th.—Dublin M.C.C., Whit-Monday Trial.

June (end of).—Dublin M.C.C., Twenty-four Hours Reliability Trial.

August 2nd and 4th.—Dublin M.C.C., Two Days Reliability Trial.

A COMBINED VARIABLE COMPRESSION RELEASE DEVICE.

A DEVICE, which we illustrate, has been patented by A. S. Baylis, 2, Lowther Street, Coventry, the object of which is to combine the functions of the exhaust valve lifter, a decompressor, petrol injector, and compression tap. It is intended to be operated by an



A patented device embodying in one instrument a release valve, decompressor, petrol injector, and compression tap.

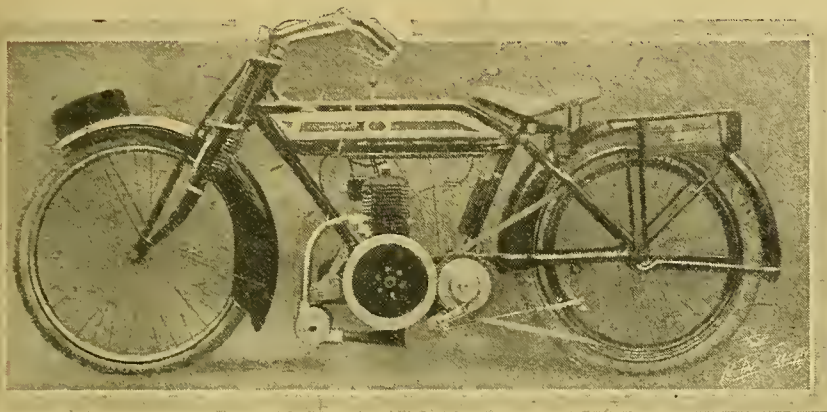
adjustable lever on the handle-bars. The main feature of the construction appears to be a valve which may be gradually opened, releasing some of the gas under compression. The outlet from the body of this valve also embodies a double-seated valve of the mushroom type, which seats automatically on the explosion stroke and on the induction stroke. A priming device is also incorporated, operated by a milled nut, and connected to the petrol tank by a pipe.

A POINT FOR BENZOLE USERS.

THE fact that benzole can now be obtained without the formalities of a licence will doubtless impel many to times in these pages, when benzole is used in a car-take advantage of it. As has been pointed out many burreter adapted for petrol it is necessary to make provision for an increased air supply. We repeat this information, as we have recently heard many complaints from benzole users as regards the tendency of this fuel to gum up the valves and dirty the engine internally—a state of affairs which is generally due to too rich a mixture. If the carburetter is not already fitted with an adjustable air supply, it is certainly worth while to get one, simply drilling a hole in the induction pipe and arranging a clip cover. A good-sized oil cup, threaded into the induction pipe, is quite satisfactory, the extra air being allowed to enter or shut off, simply by opening or closing the lid of the cup. It should be placed downwards, so that grit cannot collect in the bowl of the cup. This is a simpler arrangement than changing the jet each time the fuel is changed. If benzole be employed and the maximum amount of air given, truly astounding m.p.g. can often be obtained.

THE CONNAUGHT PEACE MODEL.

New Model of a Pioneer Two-stroke Lightweight.



The peace model Connaught $2\frac{1}{2}$ h.p. two-stroke.

NEW models of the Connaught are always of particular interest, if only on account of its position as one of the two pioneer simple two-strokes which popularised this useful type of machine. After four years of war, one naturally expects alterations from a firm manufacturing its own engine, but although the Bordesley Engineering Co. has been practically exclusively engaged upon "munitions" during the war, the principals have found time to experiment. The results of these experiments have not brought forth any discoveries necessi-

tating alterations to the engine, consequently the peace model Connaught follows the pre-war models closely, with the addition of minor refinements.

The engine has a bore and stroke of 73 mm. and 70 mm. respectively, the capacity being 293 c.c., and, as in the pre-war model, the cylinder is offset, which, it is claimed, permits of a more effective scavenging by reason of the slow movement of the piston at the points of exhaust and intake. The exhaust and inlet ports are superimposed, so that the mixture passes into a chamber in the

manifold, which is separated from the exhaust chamber by a thin partition of steel. By this means the cold gas takes up some of the heat of the exhaust, cooling the later, and becoming more thoroughly vaporised. This feature is patented, and is used in one or two other leading makes under licence from the Connaught firm.

It may be remembered that it was the Bordesley Engineering Co. which introduced the petrol system of lubrication into this country, and, while it was much ridiculed at the time of its introduction, it has been found fully efficient for two-stroke engines, not only by the Connaught concern, but also by many others. The war-time experiments of the makers of this lightweight have been with lubrication, and it is interesting to note that they still retain the system, and have every confidence that it is the best method of introducing lubricant into the engine.

One of the new features of the machine is the tank, which is most pleasing to the eye. The edges have broad bevels, and with the aluminium and red panels give the machine a very distinctive appearance.

The machine is fitted with 26×2 in. tyres, and weighs 125 lb., with single gear, all-belt drive, the price being £42. With a countershaft two-speed gear and clutch, the price is £53, and without clutch £49 15s.

A miniature model with 24×2 in. tyres is also catalogued, a single gear machine at £34 and a two-speed at £42 15s.

THE SCOTT SOCIABLE.

A New Company formed to Market Mr. Alfred Scott's Three-wheeler.

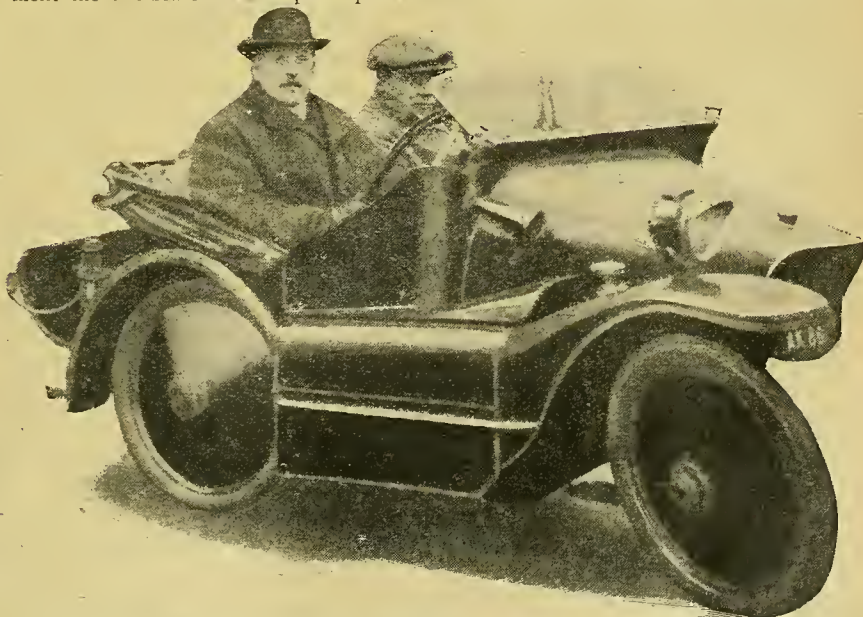
AT the time we introduced the Scott Sociable to the motoring world in 1916, we characterised it as a most praiseworthy attempt to solve the problem of weatherproofing the most economical form of two-seater. Owing to the war, the idea of manufacturing it in quantities had to be postponed. We are now in a position to announce that new and extensive works have been acquired in the Bradford district for the manufacture of the Scott Sociable in big quantities. The Scott Autocar Co., Ltd.—an entirely new company, under the management of Mr. C. Tunstall, who formerly held a similar position with the Scott Engineering Co.—will market the runabout, which, incidentally, is to retain the original title of Scott Sociable, the designation given it by the Editor of *The Motor Cycle*.

The specification of the Sociable which we described and illustrated in detail on July 27th, 1916, and January 4th, 1917, is as follows: Vertical two-stroke water-cooled engine, 76.2×63.5 mm. bore and stroke—578 c.c. capacity, clutch situated in flywheel, three-speed gear, shaft drive, triangulated frame sprung fore and aft, detachable and interchangeable disc wheels.

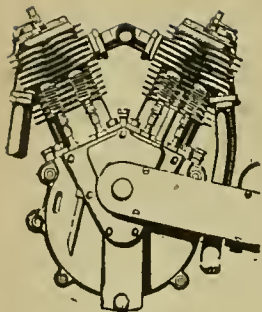
The car literally bristled with ingenious features, as do most Scott productions, and we feel sure that our readers will hail the announcement with joy, since it

brings nearer to successful accomplishment the two-seater weatherproof passen-

ger vehicle at a price approaching the £100 mark.

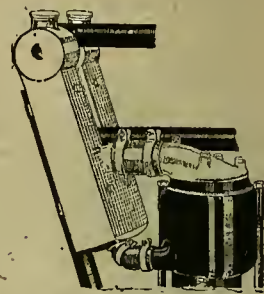


The Scott Sociable, produced in 1916, with Mr. Alfred A. Scott, A.M.I.A.E., the designer, at the wheel.



A Water-cooled Sidecar on the Scottish Hills.

Conditions Affecting its Efficiency.



A GREAT deal has been said in favour of water-cooled engines, more especially for sidecar use, and the Scott motor cycle stands out as an example of the suitability of the system for solo use. My own experience of water-cooling is that it is eminently successful in a moderately undulating country. It is, however, apt to be a nuisance when one's riding is done over really mountainous roads, such as one encounters in Scotland, where eight or nine mile rises are commonly met with in passing from one valley to another. Water-cooling is entirely dependent upon a current of air for cool running. Recently my journey lay over the mountain tops in the teeth of such a gale that we had nine miles of low gear work ere we gained the height of land, yet there was no suggestion of boiling, and the engine demanded a minimum of oil. On the return journey we had the gale behind us, and, though we resorted to low gear only for two miles or so, the water in the radiator was all but boiled away ere we shut off for the descent.

Disadvantages of the System.

Repeatedly this has been my experience with water-cooled engines. Travelling against the wind all goes well, but with a following wind the least excess of low gear work brings the water to boiling point. This is a great nuisance, since one is compelled to stop in order to fill up, quite apart from the mess that is created by the radiator overflowing.

The pith of all this is, then, that a water-cooled engine is more dependent on the wind for retaining its proper temperature than is an air-cooled engine.

Of course, there are two sides to the question. It may be argued that, whereas the water-cooled simply boils, thereby giving visible warning, but at the same time retaining its full power, the air-cooled overheats till finally it peters out, which is bad for the engine and more annoying for the rider. But does a modern air-cooled engine overheat to that extent under the same conditions? My opinion is that it does not. It may attain a temperature far and away above boiling point, but boiling point is an unnecessarily low temperature; therefore all the trouble that is caused by the radiator boiling over is the result of quite unnecessarily attempting to keep the engine at a lower temperature than good results demand.

Of course, if one is using a 500 c.c. engine for hauling a sidecar over these mountain roads water-cooling is thoroughly worth while and calculated to prevent many a konk, but taking a modern sidecar outfit of, say, 8 h.p., it is very seldom one experiences overheating provided the engine is properly tuned. Curiously enough, moreover, the conditions which cause an air-cooled engine to overheat are often the reverse of those which cause a water-cooled to boil.

I have had an air-cooled overheat when slogging away for miles on middle gear against a wind, whereas a water-cooled seldom boils under these conditions; similarly, it is very seldom I have had an air-cooled overheat with a following wind, as often happens in the case of a water-cooled engine.

The Future of Water-cooling.

Interesting though the water-cooled motor cycle engine is, there is every probability of the system dying out entirely except in such engines as the Scott, which is a type by itself. Vast strides have been made in air cooling, with the result that the more elaborate system becomes superfluous, and the general tendency will be with internal combustion engines of every type to adopt the simpler method. Water-cooling is a complication, and for the motor cycle a very significant one. The additional weight, though not so great as one would imagine, is a consideration, and the whole question revolves round the point—is it necessary? It would seem that the only factor to warrant the water-cooled motor cycle engine is the inefficiency of air-cooling, and as it cannot be claimed that the air-cooled engine is inefficient, since it is calculated to become in the future infinitely more efficient than in the past, there would seem but a poor prospect for the water-cooled.

Over and above all this, however, the water-cooled engine is not to be lightly discarded. It has been retained by many of the world's leading engineers in aero practice, where the question of weight, etc., is all important, solely on account of its superior durability and reliability, its economy in lubrication and sparking plugs. But aero engines are not up against the difficulty that motor cycle engines are up against. The former are not so much limited in the area of the radiator used, and are always assured of a sufficient cooling draught. In motor cycle practice we are compelled to use a radiator of small area, and we cannot afford to carry a large volume of water.

CHINOOK.

THE MOTOR CYCLE INDUSTRY.

There is scarcely a motor cycle factory in this country which has not been extended during the war. In some cases large manufacturers have doubled their output facilities, while a few of the firms which in pre-war days were regarded as small concerns are now in a position about equal to that of better known makers in 1914. At least one Midland firm has so expanded that facilities now exist for an output of 200 machines per week, whereas before the war their average output was less than a dozen motor cycles.

LETTERS to the EDITOR

The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

THE THREE-JET BINKS CARBURETTER.

Sir,—I have followed with interest the correspondence on the Binks carburetter, and having used one for some time, perhaps my experience may be of interest to others. The carburetter is fitted to a $\frac{1}{4}$ h.p. Precision engine (single cylinder) in a sidecar combination. Total weight without driver or passenger is 4 cwt. Jets in use are 000, 4, and 10.

(1.) *Starting*.—With pilot jet open, extra air closed, and carburetter flooded, the engine will start in frosty weather at first kick on 95% benzole. Present day petrol requires an injection in cylinder as well.

(2.) *Jet Sizes to give Single Lever Control*.—Jets 000, 4, and 10 give approximately correct mixture in temperatures from 45° to 60° F. until the engine is warm, when extra air has to be given to get correct mixture. If 0000 and correspondingly smaller jets are used the mixture is about right when the engine is hot, but starting is difficult, and the mixture is too weak unless the engine is warmed up for several minutes before moving off. The mixture gets too rich and causes petrol choke when the pilot jet is nearly shut off, which necessitates adjustment of extra air lever for slow running.

(3.) *Dead Spot*.—With 000, 4, and 9 jets the dead spot occurs when opening on to the main jet unless the throttle is opened up very slowly. Different settings of air slide over the bottom air holes seem to have little effect.

I find it best to use a 10 jet for the main, as this practically cures the dead spot, but necessitates using much more extra air with the main jet in action. I find this an advantage, as when hill-climbing with full throttle one can shut off a little air and enrich the mixture.

It is useless with this carburetter to slam the throttle open, as the engine air chokes at once and fails.

(4.) *Consumption*.—I get 70 to 75 m.p.g. on straight runs with passenger. The best I could do with another carburetter on the same engine was 55 m.p.g.

(5.) *General*.—The engine is much more responsive to control than with the previous carburetter. It will tick over in free on the pilot jet at 250 to 300 r.p.m. Acceleration is better, and power on full throttle is much greater.

I think the Binks is the nearest approach to an automatic carburetter that has yet been brought out, but it fails in one respect, i.e., compensation for temperature variation, and unless this is overcome I fail to see how any carburetter can be called "automatic." I should not like to use the Binks without the extra air lever fitted.

Arriving at the correct jet sizes for any particular engine is a matter of much experiment, and I think many users have never got the best results because they have not spent time on this.

Usual disclaimer.

A. SHARVELL CULLWICK.

Sir,—There is a self-complacency about Lt. Wheeler's letter of February 6th which is generally found only in the incubations of the very young.

I believe that Mr. Binks claims to have sold upwards of 20,000 carburetters. Lt. Wheeler has apparently tested something less than ten, and upon the strength of that he is apparently prepared to assert that none of the remaining 19,990 has a dead spot, and this in spite of Mr. Binks's own explanation (see letter published on September 12th, 1918) of the causes which occasionally lead to a dead spot.

Personally, I regard Capt. Lindsay's letter a better testimonial to the Binks carburetter than Lt. Wheeler's; for the former has had a large experience of the carburetter, and

must have found some considerable advantages which outweigh the single disadvantage of the dead spot—in fact, he says so in his article—while the latter's experiences are insignificant in comparison.

J. HOLLAND.

T.T. RACES IN THE ISLE OF MAN.

Sir,—In a paragraph in your issue of the 30th ult. it is suggested that, owing to the uncertainty as to whether the T.T. course can be put into proper order, Ireland is the only alternative for a race this year. I do not know on what facts this paragraph is based. The truth is that the T.T. course, with the exception of one small part, is in as good condition to-day as it was in 1914, when the races were last held. That one patch—it is part of the mountain road—is cut up very badly, and I have talked the matter over with the Highway Board, which is responsible for the upkeep of the Manx roads, and the Board is ready, provided the A.C.U. signifies its willingness to hold the race, as quickly as possible to divert all work on other roads and to restore, and even better, the T.T. course, so that the races could be held here as in former years.

I trust that your influential journal will do what it can to assist in the reconstruction of the T.T. races. The Isle of Man has passed through a very bad time since August, 1914, and it wants every possible help it can get, otherwise the plight of the inhabitants, who have hitherto always given of their best to the motor races, will be terrible. I might add for your information that the Shipping Controller has already informed the Island that we shall have our boats back before June next.

Douglas, I.O.M.

GEORGE S. A. BROWN.



THE STRIKE BREAKERS. A Douglas owner makes good use of his sidecar during the suspended operations of the Tube railways.

TO KEEP THE HANDS WARM.

Sir,—A tip for winter riding: Instead of thick gloves, get a pair of fur or fleece-lined handle-bar muffs. They keep the hands beautifully warm, and one is free to make adjustments, etc., without the trouble of pulling off gloves.

E. W. R. PETERSON.

INFINITELY VARIABLE GEARS.

Sir,—Re your article on "Gears" by "Julius" in the issue of *The Motor Cycle* of January 23rd, I may state that I have patented a gear for either chain or shaft drive which gives ratios from 1 to 1 down to infinity (theoretically—practically it is a 1000 to 1), free engine and a reverse. Owing to the difficulties of obtaining material, etc., during the war, it has not been possible yet to test this sufficiently to market it, but the principle is one which has been used in the textile industry for years, and has given every satisfaction.

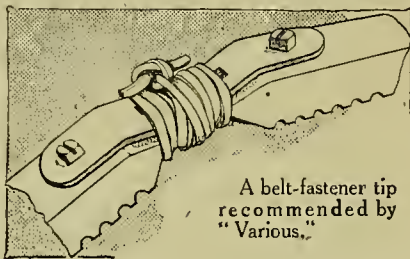
Now that hostilities have ceased, I hope to be able to place it on the market within a few months.

T. W. E. BROGDEN, LIEUT., R.A.F.

THE LIFE OF BELTS.

Sir,—I have found a very perceptible lengthening in the life of the belt when used on an infinitely variable gear if the belt ends are shaped to fit well home in the belt fastener, and a still further improvement if the belt fastener hook is wrapped round with a thong or belt lace. This soon shapes itself to the angle of the pulley, and when running on low gear increases the arc of contact very considerably, and does away with the "click" of the belt hook when passing the pulley, and if this thong is tied with a knot on the top the leather will last until it is time to shorten the belt again. I enclose a model, which may be of interest to some of your readers if sketched.

Coventry.



A belt-fastener tip recommended by "Various."

VARIOUS.

SPEED!

Sir,—In your issue of January 16th your contributor "Ixion" discourses on the "Hogbus" of the future, and makes the statement that an ex-R.A.F. pilot "accustomed to 150 m.p.h. will not be thrilled by slamming open his throttle with about $3\frac{1}{2}$ h.p. loaded up to about 4 cwt." Your contributor is evidently labouring under the same delusion as the said R.A.F. pilot, who very probably joined the Royal Air Force under the impression that he was likely to experience the joys of hitherto un hoped-for speeds. Surely enough has been written about flying to make it quite clear, that the 150 m.p.h. that is made by our single-seated fighters does not convey the feeling of high speed to the pilot unless he deliberately makes mental notes of the actual distance apart on the ground of objects over which he is flying, and the time he takes to pass from one to the other. Flying an aeroplane at 10,000 feet may be compared to sitting in a fixed aeroplane and looking down on a huge coloured map which is slowly passing underneath the machine. The first impression I got when I was "taken up" was that the machine was unable to make any headway in the terrible wind which seemed to be blowing. We barely seemed to be moving, and yet the air speed indicator registered fifty knots. The wind illusion was, of course, caused by the fact that I was in the propeller "slipstream." When landing, the nearer the machine gets to the ground the more speed it seems to acquire, although the speed is in reality being reduced from "gliding" to "stalling" speed.

Most aspiring pilots went in for flying with "Ixion's" delusions as to feeling the speed of an aeroplane, and as their instincts are not likely to change until they grow considerably older, they will probably demand some sort of "hogbus." I personally consider that the T.T. model, or its 1920 equivalent, will have a great vogue among ex-R.A.F. pilots. Young men of eighteen to twenty-one do not need kick-starters and four

speeds, and it is doubtful if many of them would care for the extra weight and expense.

I cannot agree with "Torque" that "losing one's prop" is a matter of small account at any time, and especially with a stationary engine. Does he know of any stationary that will restart purely from "friction of the air on the propeller"? As his article is extremely informative and well-written, he probably is speaking from actual experience, and, if so, I should like to hear about it as far as it concerns my point.

New Brighton.

REVS.

AN OPINION OF A WELL-KNOWN COMPETITION RIDER.

Sir,—Post-war machines! Many times have we read these words in *The Motor Cycle* during the arduous times just past, and considered them in many climes and many countries strange to the motor cycle.

Surely, if Mr. Manufacturer has studied the lessons which the war should have taught him, we shall get at least improvement of detail.

In the past we have been troubled with the small things on a machine; some fittings are "too flimsy," and in consequence cause trouble on the road, and by frequent renewal increase the cost of motor cycling. "Accessibility" is another point which needs careful investigation, and in my opinion the seller who can always point out to the buyer the simple way he can remove this or that, without having to interfere with something else, scores points all along the line. Problems of compromise, I know they generally are, but still improvement can be made with a little extra care and forethought.

The question of competitions is another post-war item, and we must look to the A.C.U. to give us something really instructive, and a more searching test than in pre-war days. How many entries would be forthcoming for a week's trial without tool outfit or spare (except tyre repair outfit) and standard machines taken from stock? A perpetual trophy, to be held for one year, should be put up for this event.

The future of the motor cycle is in the hands of the manufacturers, and the onus rests with them to place before the buying public a machine at all times serviceable and thoroughly reliable, with comfort and cleanliness combined.

W. PRATT.

ELECTRIC LIGHTING BY DRY BATTERY.

Sir,—The article, "Electric Lighting by Dry Battery," by "F.B.S." calls for a strong protest. I have no stake in the matter other than a keen interest in the pastime for its own sake, but I think that non-technical riders, who generally pay heavily for experience, should not be misled by such claims as the writer puts forward.

Leaving out of question the weight and inelegant encumbrance of any kind of battery on a motor cycle, one is compelled to state in definite terms that primary cells of any kind whatsoever are useless for electric lighting on a motor cycle. A dry cell that would last two years on a door-bell circuit would be such a good proposition that the "wet" Leclanché would cease to exist outside of museums. I will quote an instance of everyday dry battery service. Dry cells are used in appliances, "galvanic" sets, faradic coils, etc., for electrical massage treatment, almost to the exclusion of wet varieties, on account of convenience, and the currents normally used are measured in terms of milliamperes, yet their life is rarely as long as six months. Average discharge 15 mil-amperes, not $1\frac{1}{2}$ ampere for nine months.

"F.B.S." says his head lamp gives 6 c.p. and tail lamp 3 c.p. All I say is that if he can get 6 c.p. from a 4 watt lamp and 3 c.p. from a 2 watt lamp, he is indeed fortunate. Of course, to a motor cyclist who has cash to spare, a dynamo and accumulator are the finest lighting outfit possible, because as soon as the battery gives trouble he can throw it out and replace with a new one; but to the rider not so well blessed I say electric light is "off," because an accumulator is a *sine qua non*, and the accumulator has yet to be invented which will survive the strenuous conditions of service on a motor cycle, and a well-made acetylene outfit is quite reliable and cheaper.

In conclusion, I suggest that electric light has been boomed for motor cycles merely because a few like to emulate car practice, and partly because of the shortage of calcium carbide.

St. Albans.

PRACTICAL ENGINEER.

ALUMINIUM RADIATING FINS.

Sir,—I have been experimenting for some considerable time with a view to obtaining better cooling of motor cycles and other air-cooled engines, and have now perfected and provisionally patented a method of permanently uniting aluminium radiating ribs with a cast iron cylinder body.

It is a well-known fact that aluminium has a much higher conductivity than cast iron, the proportion being about $2\frac{2}{3}$ to 1 in favour of the former metal, and numerous attempts have been made to fit ribs to iron or steel cylinders. Any method of casting on or shrinking the ribs over a barrel is bad, as, upon heating, the aluminium having a greater expansion than iron becomes loose, thus destroying the metallic contact between the rib and the cylinder with a great loss of cooling effect. In my method the rib forms part and parcel of the cylinder body, being put into place during the actual moulding and casting of the cylinder.

The sectioned cylinders show the metallic contact to be perfect under all conditions; any temperatures up to dull red heat having no effect whatever, and on cooling or heating the ribs ring as sound as those on cast iron. The ribs may be made any depth, and as close together as desired, and it is impossible to separate them from the cylinder without tearing the aluminium or breaking the cast iron.

This construction marks a distinct advance in cylinder design: the aluminium ribs giving very much greater cooling whilst retaining the desirable features of a cast iron cylinder, and the rib being in perfect metallic contact with the walls, allowing a free and unobstructed transmission of heat.

The method should be of great value, particularly in the case of two-stroke engines. The extra cooling should make a vast difference, and to a great extent overcome the sticking up of the top ring due to carbonised oil.

EDGAR RUSSELL.

FUEL PRICES.

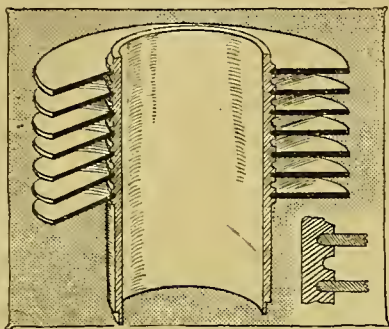
Sir,—Reading so much of the high prices of fuel, and the uncompromising attitude taken up by the different companies, I am surprised the powerful associations of manufacturers and owners do not take up the matter in a more practical manner. Suppose, for instance, the A.A. decided to supply its own members with petrol, and invited its members to supply the capital according to the h.p. of their motors. I do not think the Association would be long before it had all the capital required. Then with its system of scouts all over the country, it has the means of distribution already established, a percentage on the sales being retained by the purely tourist department of the Association, which would greatly reduce the wages account.

Surely something of the kind can be done. There is never a disease without a remedy, and we should be a poor lot if we put up with being fleeced by these big monopolies without making some effort. Although I only own a $3\frac{1}{2}$ h.p., my £5 or £10 is ready any time.

A. J. MALBY.

A SUGGESTED UNION.

Sir,—The majority of motor cyclists seem a very meek-minded lot, or long ago we should have had some something done to put a reliable fuel on the market at a reasonable price. Unless the industry is to be strangled, it is absolutely necessary that we should have this done without delay. The tens of thousands of returning men from the war, in the great majority of cases, cannot possibly afford to run a machine with fuel at the present fancy prices. With regard to benzole, I have just been experimenting with it, and find it far superior to No. 3 petrol, which is little better than



Section of a cylinder designed by Mr. E. Russell, showing the aluminium fins in position on a cast iron body.

neat paraffin. With "petrol" my combination rapidly heats up and will not take the most moderate hill without knocking and konking (unless dropped into bottom (!) gear), whereas with benzole, knocking and overheating quite disappear. Of course, the drawback to its use, in winter, is that it is impossible to start up on it. I have to inject No. 1 petrol (cold) or No. 3 (hot) to effect a start. The price charged, 3s. a gallon, is absurd. It could be sold at a good profit at 1s. a gallon, but it looks as if a "combine" had been effected, as one big company supplies both petrol and benzole (!), and so riders are bled for the benefit of the shareholders. What is wanted more than anything else is a strong motor cyclists' union, which could easily enforce fair treatment at the hands of manufacturers of fuel, as well as of machines and accessories. What excuse can be made, for example, for the way makers are charging £3, and over, for carburettors?

If a strong union were formed, with a nominal subscription (2s. 6d. a year would be enough), it would be a simple matter to obtain machines and fuel, etc., at a reasonable price, and, not only so, but the present numerous faults in machines would be rapidly eliminated. A general meeting once or twice a year in our largest towns would be quite enough to draw up the necessary requirements.

We want no more machines put on the road with working parts (wheel spindles, etc.) calculated at about 5% above breaking strain, and it is about time riders "got a move on" by taking action in the way I have named—forming a strong union. I can see no possible objection to the plan, though the trade might raise some, naturally. Making every allowance for extra cost of labour and materials, there is no excuse whatever, in my opinion, for the present-day fancy prices charged for fuel, for motor cycles, or for necessary accessories.

M. HITCHCOCK.

BENZOLE.

Sir,—I am in full agreement with "Motorist and Chemist's" letter criticising the N.B.A.'s fuel specification, and am quite sure that this specification has certainly never been worked out by any chemist who really understands either motors or benzole.

As he says, three shillings per gallon is too much to charge for this product, especially considering the price at which the Government have taken it.

His suggestion that the National Benzole Association should call a meeting of both chemists and engineers is a good one.

I think a benzole for fuel use would be quite good if made of 88% of 95's standard benzole with 12% 90's toluol to prevent freezing, and would give the producer an outlet for the toluol which now seems to be a drug on the market.

I find that a lot of benzole now being produced is going to the petrol companies, which is to be deplored.

As regards your remarks in "Current Chat" re poor benzole, I might say that there is absolutely no reason for this, as the quality should be a great deal better than that obtained pre-war, as the Explosives Department of the Ministry of Munitions have made the tests much more exacting, with the result that benzole now contains more benzene and less toluol in proportion than the pre-war 90% benzole.

I am pleased to see the prominence you give this subject, as this all-British industry should be encouraged, so that the price of petrol will become reasonable.

ANOTHER MOTORIST AND CHEMIST.

Wakefield.

[Licence-free benzole can now be purchased at 2s. 4d. per gallon.—ED.]

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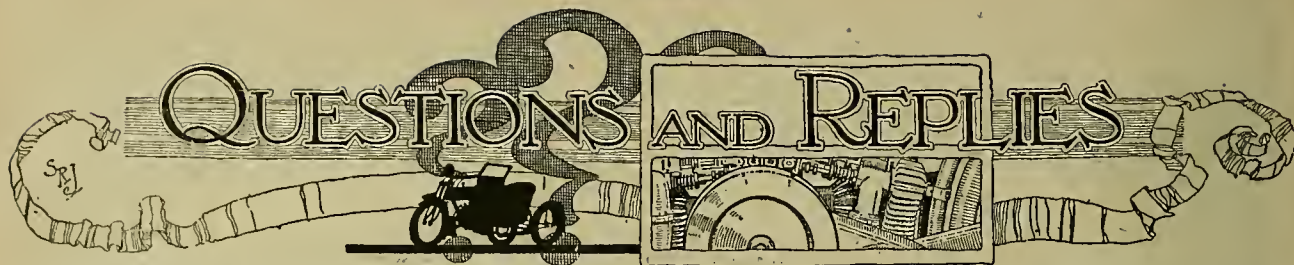
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A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C.4, and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

Backfiring.

?

After about five miles running on my Scott at a good pace the induction pipe blows off. It is a 1911 model, with a Bosch magneto and a Scott carburettor.

Do you think I have timed the magneto too early? I have tried retarding it one tooth, but then the engine spits in the exhaust.—H.H.L.

The trouble may possibly be due to retarding the ignition too much, or to too weak a mixture. It is just possible that the trouble might have been due to an explosion in the crank case if the pipe was violently blown off, and this might have been caused by the absence of gauzes in the transfer port covers.

Magneto Conversion.

?

I have a spare magneto, and am thinking of fixing it on to my Morgan for a lighting outfit while the machine is running, utilising an accumulator when the machine is stationary. The armature being H section is, of course, useless for charging the accumulator, but, is it right that, with permanent field magnets, the voltage is not materially affected by the speed of the armature within certain limits? I propose removing the contact breaker and utilising the current off the low-tension part of the armature only, running the wires one from the cut-out and the other from earth. It is a car magneto. At what speed do you think would give enough current for five lamps?—T.W.E.B.

Although it is possible to use the primary windings of a magneto in this way, the output will vary a good deal with the speed, in spite of the field being produced by permanent magnets instead of electric magnets. There are some lighting sets made in this way, but the field magnets in that case, being much larger and more powerful, will ensure better regulation. There is no reason why you should not try it, however, and we should suggest that you gear the magneto so as to run at about 1,500 to 2,000 r.p.m. at the ordinary speed of your engine. We presume you intend to replace the long central screw after removing the contact breaker, otherwise you will not get a connection to the primary windings from the cut-out terminal. The best output is given at a speed of about 2,000 r.p.m., and at this speed the magneto will give a current of 2 amperes at four volts or 1½ ampere at six volts. Probably the best light would be obtained by using two six-volt four candle-power lamps in parallel.

Purchasing a Motor Cycle.

?

Could you give me your opinion of a 3½ h.p. Premier motor cycle? I am considering buying one second-hand for use with a sidecar.—D.R.A.

The 1914 3½ h.p. three-speed countershaft motor cycle (not a 1915 model, which was enamelled grey) was a good machine, as its records in the trials with sidecar testify. When buying second-hand, it would be advisable to remove the exhaust valve cap and examine the cylinder wall at the point where it is nearest to the exhaust valve seating, to ascertain whether this is cracked. Replacement cylinders are not obtainable just now.

Legal Query—Essence of Contract.

?

I gave an order about three weeks ago for a new machine, to be delivered in February, paying a deposit of £5. Since then I find I cannot possibly pay for it. I have written the agents, explaining that I cannot pay for the machine, and asking them to cancel the order, I forfeiting my £5 deposit. They have answered, explaining that they cannot cancel the order, and that when the machine is ready they will enforce payment. (1.) Can I legally cancel the order? (2.) What do you advise me to do?—G.R.

It is quite clear that you cannot cancel the contract by forfeiting the deposit, and the agents can make you take the motor cycle, or they could resell it and sue you for any loss sustained. If the motor cycle is really worth the money which is being paid for it, one would imagine you would be able to get someone to take the machine over at the same price; but it rather looks as if you have made a bad bargain, as otherwise one would think that the agents would be only too pleased to have the deposit of £5 and then resell to another party at the same figure. However, you have entered into the bargain, and must put up with the consequences if you do not pay. The proper course is for you to inform the agents that, having regard to the attitude they take up, you intend to carry out the contract, and will be glad to know when the machine is ready. You could in the meantime take steps to resell. You do not say what machine you have ordered, but if it is a good make you should have no difficulty in disposing of it, and getting someone to take the deal off your hands by completing the purchase, in view of the scarcity of new machines at the present time, at a good price.

READER'S REPLY.

In reply to the queries of your correspondent, "F.H.," in your issue of January 30th, re F.N. motor cycle, machine No. 35,757 was made during the year 1910. The F.N. multiple-disc clutch can be fitted to any fixed gear machine by substituting it for the existing flywheel and screwing a new front cover into the bottom bracket. The flywheel is screwed on a left-hand thread with a right-hand lock-nut, a special tool being required for its removal. A two-speed gear can be fitted between the bottom bracket and the bevel case in place of the plain driving-shaft and frame tube. Gears for converting old machines were made by Messrs. Horstmann, of Bath, but the only people now likely to be able to supply are Messrs. Robert Earl and Co., High Street, Hampstead, London, N.W. If the machine will not run slowly, make sure the distributor is clean, fit new inlet valve springs, and take great care to make all joints on the induction system perfectly airtight. Also see the exhaust valves are not sticking in their guides owing to burnt oil. Should your correspondent require any other information, I shall be pleased to give it.—ERIC CAUDWELL.

EXPERIENCES WANTED.

"A.W.N." (Hull).—4 h.p. Douglas and sidecar. Consumption, speed, and reliability.

RECOMMENDED ROUTES.

BRADFORD TO SOUTHPORT.—E.W.

Bradford, Halifax, Huddersfield, Rochdale, Bury, Bolton, Hindley, Wigan, Skelmersdale, Ormskirk, Scarisbrick, Southport. Approximately 76 miles.

LEICESTER TO COLWYN BAY.—E.B.

Leicester, Market Bosworth, Tamworth, Lichfield, Rugeley, Weston, Stone, Pipe Gate, Woore, Nantwich, Tarporley, Chester, Mold, St. Asaph, Abergele, Colwyn Bay.

ORPINGTON TO ROCHESTER.—H.K.G.G.

Orpington, St. Mary Cray, whence you can reach the main Dover Road, which follow for a short distance, then turn left for Sutton-at-Hone, Cobham, Cuxton, Rochester.

BRADFORD TO LEEK.—A.E.B.

Bradford, Brighouse, Huddersfield, Holmfirth, Holme, Woodhead, Glossop, Hayfield, Whaleybridge, Buxton, Royal Cottage Inn, Leek. Approximately 65 miles.

MISCELLANEOUS ADVERTISEMENTS.

PRICES.

ADVERTISEMENTS in these columns—First 12 words or less 2/-, and 2d. for every additional word. Each paragraph is charged separately. Name and address must be counted. Series discounts, conditions, and special terms to regular trade advertisers will be quoted on application.

Postal Orders sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd., and crossed** & Co.

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.4), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge, which must include the words Box 000, c/o "The Motor Cycle." Only the number will appear in the advertisement. All replies should be addressed No. 000, c/o "Motor Cycle," 20, Tudor Street, E.C.4.

DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pays carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged; when under £10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

MOTOR CYCLES FOR SALE.

A.B.C.

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery of the new A.B.C. [2254]

WE Are Now Booking Orders for earliest deliveries of A.B.C. motor cycles. Secure an early delivery by placing your order with us now.—Dunwells' Garage, Wigan. Tel.: 328. [X3219]

JONES' Garage, appointed North and North-west London agents for the A.B.C. motor cycle; large contracts placed; let us book your order, if you want prompt delivery, which is expected in March; price £70.—The Broadway, Muswell Hill, N.10 (short bus ride from Finsbury Park or Highgate Tube). [4014]

Abingdon.

A BINGDON King Dick, late 1914, 3-speed, Gloria De Luxe sidecar, luggage and petrol carrier; cheap.—A.D., 4, Ormand Yard, Jermy St., London. [3919]

A BINGDON, 4hp. King Dick engine, 2-speed gear, clutch, new heavy tyres and tubes, B. and B. new condition, faultless; trial: £35; evenings—102, Lethian Rd., North Brixton. [3870]

A.J.S.

1917 A.J.S., 6hp.; £85.—Below.

1916 A.J.S., 4hp., lamps, horn, speedometer, very good condition: £75.—Elce and Co., 15-16, Bishopsgate Av., Cammille St., E.C.3. [0481]

MAUDE'S MOTOR MART For Earliest Deliveries

of

P. & M.
B.S.A.
JAMES
ROVER
M ARIEL
O LEVIS
D TRIUMPH
E MATCHLESS
L NEW IMPERIAL
S ROYAL ENFIELD

Orders booked for delivery in strict rotation. Highest prices allowed for your present mount.

YOU HAD BETTER NOT BUY A

MOTOR CYCLE

Unless you are sure of getting a good one with

A GUARANTEE.

SECOND-HAND.

RUNABOUTS AND CARS.

HUMBER 1914 10 h.p. 4-seater Touring Car £425
CALCOTT, 1916, dynamo set, standard £375
PHENIX, 1913, 11.9 h.p., 3-seater £200
STELLITE, 1914, dickey seat £260
ENFIELD, 1915, dynamo lighting, yellow and black £275
WOLSELEY 1912 12-16 h.p. Laodauette £375
G.W.K., 1915, 8 h.p., standard £190
MORGAN, 1915, 8 h.p., G.P. £185
HUMBERETTE, 1914, w.c., Stepney Bargain £135

SIDECAR COMBINATIONS.

HARLEY-DAVIDSON, 1917, 7-9 h.p., electric model £135
P. & M., 1914, 3½ h.p., Sidecar, as new .. £70
NORTON, 1916, 4 h.p., Norton Sidecar .. —
ROVER, 1918, 3½ h.p., 3-speed, almost new £105
SUNBEAM, 1914, 3½ h.p., Sidecar, all lamps £90
MATCHLESS, 1914, 6 h.p., 3-speed, Sidecar £95
A.J.S., 1915, 6 h.p., electric lamps £110
P. & M., 1914, 90" twin, 2-sp., new Sidecar £115

SOLO MACHINES.

SUNBEAM, 1917, 3½ h.p., 3-sp., Cowey, lamps £100
LINCOLN-ELK, 1914, 2½ h.p., nice order .. £22
RUDGE, 3½ h.p., 1913, fixed gear, very fast £22
PREMIER, 1914, 3½ h.p., 3-speed, head lamp £40
ENFIELD, 1917, 3 h.p., twin, as new £69
NEW IMPERIAL, 1917, 2½ h.p., 2-speed .. £45
TRIUMPH, 1908; requires repairs £25
SUNBEAM, 1915, 3½ h.p., 3-speed, like new £95
P. & M., 1914, 3½ h.p., 2-speed, kick-start B.S.A., 1916, 3½ h.p., single-speed £45
STEWART, 1918, 2½ h.p., 2-stroke, 2-speed, shop-soiled only £48
STEWART, 1918, 2½ h.p., 2-stroke, single-speed, new £35
ALLDAYS MATCHLESS Frame, less engine and gear box £10

100, Gt. Portland St.,
London, W.1.

Telephones: Mayfair 552.

Museum 557.

Telegrams: Abdicat; Wesdo,
London.



MOTOR CYCLES FOR SALE.

A.J.S.

A J.S.—For 1919 models and service, Taylor, Garage, Wednesbury. [3774]

A J.S. 6h.p., 2-speed, kick start, countershaft: £55.—79, Park Hill, Clapham. [3915]

CROW Bros., Guildford.—A.J.S. Agents since 1912. Write us for your requirements. [9777]

A J.S. Combination.—Book your order now for earliest delivery.—Parker's, Bradshawgate, Bolton. [X3808]

1919 A.J.S. Combinations.—Write Merrick's Stores, 174, Listerhills Rd., Bradford. 'Phone: 2439. [X2430]

A J.S. Combination, 2-speed, countershaft, all-chain, stored 2 years: £60.—17, Garden Av., Mitcham Lane, S.W. [3961]

1915 A.J.S. Combination, spare wheel and tyre, screen, lamps, speedometer; price £120.—Wauchope, 9, Shoe Lane. [3980]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery of the new A.J.S. [2255]

A J.S.—For quick deliveries try the sole Leicester-shire agent, Will Chapman, 113, Belgrave Rd., Leicester, the first appointed A.J.S. agent. [3531]

24 h.p. A.J.S., 3-speed, h.b. clutch, Lucas set, speedometer, perfect; exchange for good combination, or sell £54.—"Gwalior," Rustic Av., Streatham, S.W.16. [3683]

A J.S., 1914, 6h.p. (750 c.c.), detachable rear wheel, late 1915 A.J.S. sidecar, good order throughout, accessories: £75/10.—Pewell, Holbeton Vicarage, Plymouth. (D) [X3771]

A J.S. (early 1914) 6h.p. Twin Combination, thoroughly overhauled, Coronet sidecar, lamps, accessories, powerful, fast; any trial; genuine bargain, £70.—Howse, Southall, Fairfield, Gles. [X3775]

A J.S.—For the earliest possible deliveries of 1919 models, advance specifications and super service, try the A.J.S. Specialists, The Walsall Garage, Wolverhampton St., Walsall. 'Phone: 444. [X0125]

A J.S. Late 1914 6h.p. Combination, 3-speed, gate change, h.b. clutch, fully equipped, Lucas lamps, horn, speedometer, tools, spares, all in beautiful condition, coachbuilt sidecar; lowest price £63, no offers.—Page, 11, Southgate St., Gloucester. [3694]

LATE 1917 6h.p. A.J.S. Combination, interchangeable wheels, spare wheel with new Dunlop tyre and tube, hood with side curtains and storm apron, screen, luggage grid, Lucas lamps and horn, new condition, very little used: £110.—R. L. Shiers, Cotswold, Glosby Rd., Altrincham. [X3742]

A J.S. Combination, 1916, 4h.p. twin, 3 speeds, hand control clutch, adjustable wind screen, hood, side curtains, storm apron, and waterproof hood cover, Smith speedometer, horn, Lucas lamps, and spare wheel, practically new: £110.—Can be seen at 180, West End Lane, West Hampstead, N.W.6. [3997]

A J.S. spares; prompt delivery.—Cyrii Williams, Chapel Ash Depot, Wolverhampton. [9189]

Alldays.

ALLON, 2½h.p., 2-stroke, 2-speed, as new: £35.—3, Park St., Wellington, Salop. [X3739]

ALLDAYS Matchless 2-stroke, new condition: £25.—29, St. Leonards St., Bromley-by-Bow. [3889]

ALLDAYS MATCHLESS, 3½h.p., 2-speed, 4-stroke: £37.—24, Lushington Rd., Harlesden, N.W.7. [3661]

ALLON 2-stroke, 2 speeds, hand-operated clutch; delivery from stock.—Parker's, Bradshawgate, Bolton. [X3813]

ALLDAYS-MATCHLESS, 4½h.p., 3-speed countershaft, all-chain drive, combination; 50 gns.—232, Brixton Rd., S.W.9. [3853]

ALLON 2-stroke De Luxe, 2 speeds and clutch: £55.—Isle of Wight agents, Witham Bros., Newport, Wight. Early deliveries. [3686]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery 2-speed and clutch Allons, £58; also De Luxe models, with kick start. £65 [2258]

ALLDAYS Allon.—We have five of these in stock: 1915 2-speed £33/10, and two 1916 price £42/10, 1917 2-speed hand clutch £46/10, and 1918 2-speed hand clutch and featherweight sidecar £65; all complete with accessories.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [3805]

Antoine.

ANTOINE, 3h.p., kick-starter, requires slight repairs: £10.—B. 76, Grange Walk, Bermondsey, S.E. [X3412]

Ariel.

ARIEL, T.T., late 1914, not used during war, just been overhauled: £35.—H.S., 33, St. Stephen's Rd., Bow, E. [3768]

ARIEL, 3½h.p., countershaft, solo £80, combination £106; early delivery.—Island agents, Witham Bros., Newport, Wight. [3688]

MOTOR CYCLES FOR SALE.

Ariel.

RIDER TROWARD and Co., 31, High St., Hampstead.—New 3½ h.p. 3-speed Ariel in stock, £80. Orders being booked for earliest delivery 5-6 h.p. combination. [2257]

ARIEL, 1914, 3-speed, speedometer, Lucas lighting set, tyres and everything in good condition; any trial given; £32.—A. Selbury, West Horsley, near Leatherhead, Surrey. [3698]

3½ h.p. 1919 Ariel Motor Bicycle, 3-speed countershaft gear; price £80; immediate delivery from stock; can be fitted with handsome coachbuilt sidecar, £18/4 extra; combination, complete, £98/4.—Wauchope, 9, Shoe Lane. [3981]

JONES' Garage, Old Ariel Agents.—As old agents we will be able to give prompt deliveries of the new model 4½ h.p. 3-speed countershaft, and 5-6 h.p. twin 3-speed countershaft model, which will embody several new features; 1919 3½ h.p. models from stock, £80.—The Broadway, Muswell Hill, N.10 (short bus ride from Finsbury Park or Highgate Tube). [4015]

Arno.

BARGAIN.—3½ h.p. Arno, 1914, splendid condition, not used for over 2 years, guaranteed perfect running order; first cheque, £35.—Wingate, 36, Gracechurch St., E.C.3. [3618]

Auto-Wheels.

UTO-WHEEL, good condition, new tyre; £8.—Wiltshire, Inwood, Grange Rd., Bushey, Herts. [3695]

UTO-WHEEL, standard model, good order, little used; £8.—R. Dennis, Woburn Sands, Beds. [X3631]

UTO-WHEEL, £6; also Brown lightweight, £20.—Hall, Auctioneer, High Rd., Whetstone, N.20. [3659]

WALL Auto-Wheel, complete, good condition; £5, or offers.—Burst, 27, Grove Rd., Leytonstone, E.11. [3719]

UTO-WHEEL, late model, good condition; £8/8, complete.—Geo. Smith, Motor Cycle Depot, Chapham Junction, S.W. [3741]

UTO-WHEEL and Lady's B.S.A. Bicycle, made specially for Auto-Wheel, in excellent condition; £14/14.—Mrs. Addison Seatt, Althly, Sandy Lane, Chesham, Surrey. [X3629]

UTO-WHEELS, B.S.A. model, just overhauled by company, £12/12; also standard model, £8/10.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [3806]

Bat.

BAT 8 h.p. Combination, 1914, 2-speed, kick, clutch, Millford sidecar, perfect order; £47.—Box L9219, c/o The Motor Cycle. [4009]

6 h.p. Bat and Swan coachbuilt sidecar, countershaft 3-speed gear, free engine, and kick starter, price £77/10; also a solo 2-speed Bat, fitted with 4-5 h.p. J.A.P. engine, price £55.—Wauchope, 9, Shoe Lane. [3982]

Blackburne.

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery of new Blackburne; 2½ h.p., 2-speed, clutch, £60; 4 h.p., 3-speed, £80; 8 h.p. combination, £125, or with spare wheel £130. [2256]

JONES' Garage have been appointed North and North-west London agents for the Blackburne motor cycles; 2½ h.p. 2-speed, £60; 4 h.p. 3-speed, £80; 8 h.p. combination with detachable wheels, £125; spare wheel £5 extra. If you contemplate purchasing one of these ideal mounts and want prompt delivery, let us have your order now.—The Broadway, Muswell Hill, N.10 (short bus ride from Finsbury Park or Highgate Tube). [4016]

Bradbury

4 h.p. Bradbury, single-speed model; £23/10.—Wauchope's, 9, Shoe Lane. [3976A]

BRADBURY, 3½ h.p., mag., in good order, modern; £12/15.—Hall, Auctioneer, Whetstone, N.20. [3639]

1919 Bradburies: cash or exchange.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [3756]

Briton.

BRITON 2-cyl. 10 h.p. 2-seater, complete with head, screen, 5 lamps and generator, spare wheel and tyre, in first-class running order; £90.—18, Woodstock St., W.1. [3962]

Brown

BROWN 6 h.p. Twin, 2 speed, free engine, new tyres, just overhauled; or exchange lower power.—Coe, 101, Mill Hill Rd., Acton. [X3747]

B.S.A.

B.S.A., 3-speed, 1919 models in stock.—Reys, 378, Enston Rd. [2972]

1919 B.S.A., Model H, just arrived; 78 gns.—Jenkins, Cycle Agent, Northampton. [X3408]

1917 B.S.A., 4½ h.p., 3-speed, B.S.A. sidecar; £75.—29, St. Leonards St., Bromley-by-Bow. [3887]

1919 B.S.A. Chain-cum-belt Models in stock; 76 gns.—Rivett, 236, High Rd., Leytonstone. [3652]

NEW B.S.A.'s in stock; immediate delivery Model K.—Alexander, Agent, Wallasey Village. [1506]

EVANS

I have the RIGHT Mount please you

—both in point of ECONOMY and RELIABILITY!

And it will pay you to call at "The BIRMINGHAM House for Motor Cycles and Light Cars" and inspect my representative stock. Compare at your leisure the many new models offered, and then follow up with an actual test of the mount you select.



EARLY delivery of any of the following:—

A.J.S., ENFIELD, ROVER, NORTON, INDIAN, NEW IMPERIAL, ZENITH, TRIUMPH, JAMES HUMBER, CALTHORPE, &c.

If it's a LIGHT CAR you need, equal satisfaction will follow the choice of any of these:—

PERRY, G.W.K., CALTHORPE, STANDARD.

Fix appointment by 'phone or wire TO-DAY. Complete Satisfaction Guaranteed with EVERY purchase.

P. J. EVANS

87-91, John Bright St., BIRMINGHAM.

'Phone: Mid. 662.

Wires: "Lytcar, B'ham."

ECONOMY

MOTOR CYCLES FOR SALE.

B.S.A.

1919 B.S.A. Models in stock; exchanges quoted.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [3752]

1913 B.S.A., 2-speed, kick, coachbuilt combination; £32/10.—L. Johnston, 58, Park Rd., Colliers Wood, S.W. [X3720]

B.S.A., 3½ h.p., 2-speed, excellent condition, done very little work, two new tyres; £55.—W. Sandcock, Knapwell, Cambs. [X3705]

1916 4½ h.p. B.S.A. Combination, all-chain, good condition; £65, or nearest offer.—J.C., 45, Sweet Briar Walk, Edmonton. [3787]

1914 B.S.A., T.T. model, large Miller lamp set, mechanical horn, good tyres; £30.—Parker, 65, Clifton Av., Wembley, Middlesex. [3820]

B.S.A. Lite 1913 Combination, 3½ h.p., Stewart speedometer, F.E., good condition; £40; Yorkshire, Box 2,840, c/o The Motor Cycle. [X3662]

3½ h.p. B.S.A. and Sidecar, 1912-13, 2-speed N.S.U., splendid condition; any trial; £20.—16, St. Germain's Rd., Forest Hill, S.E.23. [3643]

IMMEDIATE Delivery from stock of new B.S.A. Model K., 4½ h.p.; £79/16.—Elce and Co., 15-16, Bishopsgate Av., Cannonville St., E.C.3. [0491]

B.S.A. and Sidecar, 2-speed, free engine, good tyres, Lucas lamps, ready for road; bargain, 31 gns.—Garner, Lane Ends, Hapton, Burnley. [X3718]

1916 B.S.A. 3-speed Gear Box Model Combination, as new, all chain drive, all accessories; £76, or near.—Palmer, 127, Montgomery St., Hove. [X3715]

B.S.A.—For the earliest possible delivery of 1919 models, advance specifications and prices, sole district agents, The Walsall Garage, Wolverhampton, S. Walsall. 'Phone: 444. [X0126]

1914-15 B.S.A., 4½ h.p., all-chain drive, speedometer, lamps, etc., condition as new, not used last 2 years; £58.—Lester, 10, Hanway Place, Hanway St., Tottenham Court Rd., W. [3709]

FOR Earliest Delivery B.S.A., place your order with us. Free insurance policy with every machine ordered before March 7th.—The Brook Motor and Engineering Co., Withington, Lancs. [X2727]

RIDER TROWARD and Co., 31, High St., Hampstead.—New 4½ h.p. B.S.A. chain-cum-belt, in stock, £79/16. Orders being booked for earliest delivery chain drive model, £81/18. [2259]

B.S.A. 1916½ Combination, with head lamp, electric sidecar and rear, speedometer, horn, tools, and all accessories, very little used, in exceptionally good condition; 70 gns.—Alpha, 134, Goswell Rd., London, E.C. [3731]

JONES' Garage are old B.S.A. agents, and can give you delivery where others cannot; Model K, £79/16, Model H, £81/18.—The Broadway, Muswell Hill, N.10 (short bus ride from Finsbury Park or Highgate Tube). [4017]

B.S.A., 1915, chain-cum-belt, 3 speeds, kick, clutch, lamps, horn, speedometer, auxiliary tank, little used since 1916, perfect condition, with coachbuilt sidecar, 3 new tyres just fitted; £65 cash.—Edgell, Backley Rectory, Snssex. [3662]

B.S.A.—We have two models K, actually in stock, 76 gns. each; also 1916 K, combination, £89/10; and 1917 K, combination, £95; both fully equipped; good prices allowed on exchanges.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [3806]

B.S.A. Combination, 1914, 4½ h.p., 3-speed countershaft gears, all chain drive, tyres excellent, Lewis acetylene generator, coachbuilt sidecar, outfit in good condition, practically unriden past 2 years.—Can be seen at Wilton Carriage Co., 107, Wadden New Rd., Croydon. £45. [3630]

Calthorpe.

CALTHORPE, 1916, 2-speed, 2-stroke, as new; £32.—H.S., 33, St. Stephen's Rd., Bow, E. [3769]

RIDER TROWARD and Co., 31, High St., Hampstead.—Immediate delivery new Calthorpes, all models. [3603]

CALTHORPE Motor Cycles—All models in stock for immediate delivery.—P. J. Evans, 91, John Bright St., Birmingham. [0955]

CALTHORPE J.A.P., 1916 model, hardly used, enamel, plating, engine, etc., as new; 36 gns.—171, East Barnet Rd., New Barnet. [3667]

LATE 1916 2½ h.p. Calthorpe-Jap, Enfield gear, complete, as new, many improvements.—Apply, 56, King Edward's Grove, Teddington. [3721]

BARGAIN, £14.—Calthorpe Junior, 1914, 2-speed, F.E., unused 2 years, overhauled, tyres excellent.—Elson, Mivfield Rd., Beaufort, Mon. [3782]

CALTHORPE, 1916, 2½ h.p., 2-stroke, good running order and condition.—Legman Bros., 2, King's Parade, Acton. Tel.: 1578 Chiswick. [4034]

CALTHORPE Junior, 1916, 2½ h.p., 2-speed, fitted paraffin, 120 gallon; seen after 7 p.m.; £28, or offer.—Lawrence, 5, Dewey St., Tooting. [3703]

CALTHORPE J.A.P., late 1916, 4½ h.p. twin combination, 2-speed Enfield gear, handle starter, Stewart 80 m.p.h. magnetic speedometer, electric lamps, coachbuilt sidecar, with luggage carrier, perfect condition throughout, tools, spare tyre, price £70; seen any time.—Wells, Marton Place, Woodbridge, Suffolk. [3615]

MOTOR CYCLES FOR SALE.

Indian.

INDIAN Combination, 1915, 7.9h.p., 3-speed, coach-built, not used for nearly 2 years; seen any time. £65.—10, Woodside Rd., South Norwood, S.E. [3965]

INDIAN Combination, 1914, 7.9h.p., spring frame, 2-speed, clutch, all accessories, in splendid condition; £60: after 1 p.m. Sat.—99, Willfield Way, Golders Green. [3725]

INDIAN, 7.9h.p., 1915, owner in France, 2-speed, kick-starter, handsome coachbuilt sidecar, tools, lamps, pump, spares, etc.; £50.—Box L9,150, c/o The Motor Cycle. [3670]

INDIAN, 5.6h.p., 3-speed, clutch, lamps, spares, unused 2 years, in very good condition; seen by appointment; £57.—Capt. Crowe, Crumlin, Osborne Rd., Farnborough, Hants. [3883]

7.9h.p. Powerplus Indian and Sidecar, £80; also a 1915 5.6h.p. Indian and coachbuilt sidecar, £77/10, 3-speed gear model, clutch, and kick-starter.—Wauchope, 9, Shoe Lane. [3979]

INDIAN, 7.9h.p., 2-speed gear box, spring frame, perfect condition, tyres Dunlop studded, low and fast machine. Bargain. £39, or near.—Thorpe, 54, Hergate St., Waltham Rd., S.E. [3786]

INDIAN, 7.9h.p., 2-speed and free engine, T.T. model, in good condition, very fast; subject to any expert examination; £56, or near offer.—H., 48, Clarendon Rd., Putney, S.W. [3992]

INDIAN, 7.9h.p., 1913, spring frame, 2-speed, clutch, electric head and tail lamps, and Indian sidecar with new tyre, other tyres in good condition; £50.—Wells and Son, Dovercourt, Essex. [3526]

INDIAN, 7.9h.p., 1916, electric lighting and horn, 3 speeds, speedometer, recording, kick starter, Indian sidecar (right), mileage under 2,000; £78.—Particulars, F. V. Dalton, Dena, Kimbolton, Huntingdon. (D) [3729]

1915 3-speed Indian, Model A, mileage 500, £65: 1914 2½h.p. Douglas, 2-speed, £35; both perfect; wanted, Morgan or light car, value £100, expert examination.—MacDonald, Helensien, Rattray, Blairgowrie. [X3707]

INDIAN, 1915, 7.9h.p., T.T., free engine, Jones speedometer, Klaxon horn, lamp, 2 generators, original tyres excellent condition, not done 3,000 miles; £55 cash; seen any time.—Young, 46, Cazenove Rd., Stoke Newington; N. [3742]

VERY Fast 1916 T.T. Powerplus Indian, 3-speed, kick start, special engine, Swan sporting sidecar, complete with lamps, horn, knee-grips, and disc wheels, very good condition; £87, or modern lighter machine part exchange.—Brown, 16, Broad St., Ross-on-Wye. [X3770]

POWERPLUS Indian Combination, 7.9h.p., 1916, 3-speed, clutch, Mills-Fulford sidecar, speedometer, lamps, etc., many spares, including tubes, done under 5,000, running perfectly, owner leaving country; must sell; £75.—Longman, Fisherton St., Salisbury. [3668]

INDIAN, 1915, 7.9h.p., luxurious coachbuilt combination, 3 speeds, clutch, kick-start, disc wheels, Gloria sidecar, hood, screen, splendidly equipped; bargain for quick sale; £72/10, offer; exchange for lower power and cash.—Peat, 72, The Chase, Clapham Common. [3873]

INDIAN Combination, Swan sporting Projectile sidecar, purchased brand new October, 1918, run under 200 miles, an exceptional opportunity to obtain a practically new outfit at second-hand price; 90 gns.—Longman Bros., 2, King's Parade, Acton. Tel.: 1578 Chiswick. [3580]

INDIAN, 1915 T.T., 7.9h.p., with lamps, generator, Klaxon, overhaul just cost £10, new heavy Dunlops, 45 gns.; also 1915-16 Indian, spring frame Powerplus model, lamps, speedometer, etc., ridden under 5,000 miles, a powerful mount, in thorough order, £76.—Pughs, Engineers, New Barnet. [3647]

James.

JAMES Combination, 3-speed countershaft, in very good order; £55.—James, 114, Rochdale Rd., Blackley, Manchester. [X3414]

JAMES Twin, 1916, 3-speed gear, kick start, hand controlled clutch, totally enclosed, but accessible chain drive, only done 600 miles, perfect order; £55.—Liddell, c/o Dallas, Millgate, Capar, Fife. [3700]

1918 James Combination, 5.6h.p. twin, 3-speed gear box, chain drive, 3 lamps and horn, spare cover and tube, very little used, in perfect condition; £105; seen by appointment.—Montagu, Black Lake Cottage, Farnham. [X3683]

1915 4½h.p. James Combination, countershaft 3-speed, clutch, kick starter, new tyres, lamps, accessories, complete; 53 gns.; owner willing to guarantee same; lightweight and cash adjustment considered.—30, Legard Rd., Highbury, London, N. [3777]

RIDER TROWARD and Co., 31, High St., Hampstead—James machines. Delivery this month new 5.6h.p. twin combination, £126; 4½h.p. solo, 85 gns.; combination, 104 gns.; delivery February, 3½h.p. twin, 85 gns.; March, 2½h.p. 2-stroke. Orders accepted in strict rotation. [2267]

J.A.P.

4h.p. J.A.P., 3-speed gear, and coachbuilt sidecar; £55.—Wauchope, 9, Shoe Lane. [3971]

J.A.P., 4h.p., late 1915, single-speed, Bosch, heavy Dunlops, good, one new, lamps, genuine; £35.—Pinchin, Kelston, Bath. [X3817]



NEW MACHINES.

We are now booking orders for new machines. Those who want earliest possible delivery of their favourite mount, or a wide range of choice amongst the leading makes, should communicate at once with us. Our arrangements cover:

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MOTOR CYCLES FOR SALE.

J.A.P.

4h.p. J.A.P. Model, dropped back frame, pavelled tank, drip feed, stand, carrier, etc., 26x2½ w. Saxon forks, nearly new, less power unit; £87/10.—Clapham (Motors), King George St., Greenwich. [X3754a]

8h.p. J.A.P. Twin, internal parts brand new, also brand new frame, Druids, wheels, carrier, stands, foot brake, handle-bars, mudguards, metal footboards, and ball bearings to suit; £30: what offers?—Reid 18, Howat St., Govan. [X3565]

Kerry

KERRY 4.5h.p. Twin, Bosch mag., 2-speed, countershaft, and sidecar; £25.—Wiggins, 22, Glendale Rd., Erith. [3963]

1914 Kerry-Abingdon, 4h.p., Mabon clutch, just been thoroughly overhauled; £33, or offers; sidecar £5.—C.T., 126, Queen's Rd., Upper Norwood. [3696]

Lea-Francis

1915 3½h.p. Lea-Francis, very good condition, 5,400 miles, 2-speed, kick-starter, spare back chain, valve, 2½in. Dunlop extra heavy; £45; will ride 50 miles from Southampton to meet purchaser.—Box L9,155, c/o The Motor Cycle. [3675]

Levis.

LEVIS Popular Model 1917, little used, in perfect order; £29.—Lloyd, Lewes. [3964]

2½h.p. T.T. Levis, looks like new; will accept £25/10.—80, Sycamore Rd., Handsworth. [3813]

LEVIS, 2½h.p., with footboards, excellent condition.—Box L9,160, c/o The Motor Cycle. [3646]

1919 Levis, cash or exchange.—Halifax Motor Exchange, 18a, Union St South, Halifax. [3760]

LEVIS—Order now for earliest deliveries of 1919 models.—Longman, Fisherton St., Salisbury [2358]

LEVIS, 1915, Bosch mag., new tyres; £28.—Geo Smith, Motor Cycle Depot, Clapham Junction, S.W. [3738]

LEVIS, 1916, 2½h.p., 2-speed, little used; best offer, reserve £35.—Eadsforth, St. Winefride's, Welshpool. [X3633]

1917 Levis, 2½h.p., mag., Enfield gear; 35 gns.—Wandsworth Motor Exchange, Ebner St., Wandsworth (Town Station). [3936]

LEVIS Popular, single speed, 2-stroke; £38.—Isle of Wight agents, Witham Bros., Newport, Wight. Catalogues on request. Early deliveries [3687]

1916 Levis, 2½h.p., practically unused; seen by appointment; £36, no offers.—Capt. Tickler, Brathay, Park Rd., Teddington. Phone: Kingston 1510. [3718]

RIDER TROWARD and Co., 31, High St., Hampstead.—Levis. Delivery this month, Model E, 2-speed, clutch, £47/10; Popular, £38. Orders being booked in strict rotation [2268]

LEVIS—For the earliest possible delivery of 1919 models, advance specifications of all models, sole district agents, The Walsall Garage, Wolverhampton St., Walsall. Phone: 444 [X0127]

FOR Sale, 2½h.p. Levis, 2-speed Albion gear, brand new Dunlops, lamps, and horn, and bars, overhauled and good running order; £28; no dealers.—Burgess, Conservative Club, Epsom. [3875]

Martin.

2½h.p. Martin, very sporting, carburettor needs adjustment, otherwise perfect; best offer over £17.—Bullard, West Watling Place, Cambs. [X3413]

MARTIN Motor Cycle, Fafair engine, Senspray, Bosch, good tyres, wants overhauling; offers.—Gander, 31, North Rd. Av., Brentwood. [3781]

Matchless

MATCHLESS, early deliveries.—Sole Agent, J. A. Stacey, 12, Ecclesall Rd., Sheffield. [X1544]

CROW Bros., High St., Guildford, West Surrey agents for the 1919 Matchless. Order now to ensure early delivery. [1552]

MATCHLESS—Book your order now for delivery of the new 8h.p. models; exchanges.—Parker's, Bradshawgate, Bolton. [X3811]

NEW Matchless Combination with spare wheel, in stock; £140.—Elce and Co., 15-16, Bishopsgate Av., Camomile St, E.C.3. [0492]

RIDER TROWARD and Co., 31, High St., Hampstead.—Matchless. Earliest delivery Victory model combination £140 [2269]

MATCHLESS, 1913, racing machine, overhead valves, J.A.P. engine, perfect condition; £32, or exchange combination.—Westons, Vincent Rd., Clacton-on-Sea. [X4008]

MATCHLESS 8h.p. J.A.P., 1914, coachbuilt sidecar, lamps, mechanical horn, hood, wind screen, in splendid condition.—Bassett, Handel House, Yeovil. [3872]

MATCHLESS Victory Model Combination actually in stock, with spare wheel and tyre; £140; seen by appointment.—J. Tassell, 1a, Bloomfield Rd., Plumstead, S.E.18. [1606]

MATCHLESS and Sidecar, 1912, 8h.p., 1914 Armstrong 3-speed hub, not used from August, 1914, till January, 1919; £45; stamp for reply.—79, Arndel St., Portsmouth. [X3661]

MOTOR CYCLES FOR SALE.

Matchless

1919 Guaranteed 8-10 h.p. Matchless Combination, complete, spare wheel, carrier, etc.; £135; to be seen after 6 p.m.—Petersen, 10, Morley Rd., Twickenham, near Richmond Bridge. [3885]

MATCHLESS—Special contracting agents for post-war Matchless models; earliest deliveries; exchanges and easy payments arranged.—Maudes', 100, Gt Portland St., London, W.1. [3920]

6 h.p. Model Matchless, dropped back countershaft frame, Matchless spring forks, panelled tank, drip feed, kick-up stand, etc., less power unit; £12/10.—Clapham (Motors), King George St., Greenwich. [X3754]

MATCHLESS, 8 h.p., 1912, 2-speed, twin belt, late 1914, Montgomery de Luxe sidecar, screen, apron, luggage grid, new 650x65 tyres, all accessories, perfect running order, not used last 3 years; £60.—Roberts, Binkly House, Ruthin, Denbighshire. [X3687]

JONES' Garage, North London agents for Matchless; you can always rely upon us having one or two of these in stock; Victory models, £140; no waiting for month's delivery from stock.—The Broadway, Muswell Hill, N.10 (short bus ride from Finsbury Park or Highgate Tube). [4021]

Metro.

METRO All-red 2-stroke, 2-speed gear box, T.T. long plated exhaust, done about 200 miles, equal to new; £35.—68, High St., Crawley, Sussex. [3906]

METRO-TYLER—Earliest delivery of this sporting lightweight. Free insurance policy at Lloyds for all machines ordered before March 7th.—The Brook Motor and Engineering Co., Withington, Lancs. [X2728]

RIDER TROWARD and Co., 31, 40b, and 78, High St., Hampstead, sole agents for the Metro-Tyler 2½ h.p. 2-stroke for London, Middlesex, Essex, Hertfordshire, Surrey, Sussex, Kent, and portions of Berkshire and Buckinghamshire; immediate delivery 2-speed model £52, single-speed £46; demonstration model in stock. Trade enquiries invited and district agencies arranged. [3601]

Minerva.

3½ h.p. Minerva, n.o.v., Amc. £6.—G. W. Bennett, 2 Lyke, Tonbridge, Kent. [3818]

MINERVA, 3½ h.p., perfect, less accumulator; offers, or exchange anything useful.—Chandler, Castle St., Cirencester. [3730]

Moto-Reve

TWIN Moto-Reve, 2½ h.p., good tyres; £12.—Nash, 323, Boro' High St., S.E.1. [3913]

MOTO-REVE, mag. wants slight attention, otherwise sound; £10.—Milnthorpe, Rooper Hill, Sessay, Thirsk. [X3638]

MOTO-REVE 2½ h.p. Twin, mag., good running order; must sell; £12/10; will exchange 3½ h.p.—Johnson, 58, Park Rd., Merton, S.W. [X3721]

New Hudson.

LATE 1914 3-speed New Hudson, Montgomery sidecar, smart turnout, been stored 2½ years; £46.—50, Upton Rd., Dulston, N. [3669]

NEW Hudson, 3½ h.p., 3-speed, free engine, condition as new; £45, bargain.—Smith, Church Lane, Handsworth, Birmingham. [X3415]

3½ h.p. New Hudson Combination, Mills-Fulford sidecar, 3 speeds, clutch, in first-class condition; £28/10.—Atkinson, Glasshouse Mills, Pateley Bridge. [X3708]

NEW Hudson Combination, 3½ h.p., 3-speed, clutch, new tyres, in perfect condition; £49/10, a bargain, or would separate.—45, Brookfield Rd., Bedford Park, Chiswick, W.4. [3927]

1913 New Hudson, 3½ h.p., and Premier coach sidecar, idle 2 years, needs hub gears and minor repairs; inspection and enquiries invited.—Leavesley, Market Hill, Calne, Wilts. [X3763]

NEW HUDSON, 1914, 6 h.p., 3-speed, clutch, kick-starter, control from 2-seater U. and I. C.B. sidecar, hood, screen, completely protecting driver and passenger, Bosch, Binks, Jones trip, spare tank, tyres perfect, lamps, car generator; £60/10.—129, Grove Green Rd., Leytonstone. [3616]

New Imperial.

NEW Imperial-Jap, 2½ h.p., 2 speeds, lamps; £33.—39, South Parade, Oxford. [3792]

RIDER TROWARD and Co., 31, High St., Hampstead.—Immediate delivery New Imperials [3604]

CROW Bros., Guildford.—New Imperial, all models new and overhauled second-hands stocked [3778]

1915-16 New Imperial-Jap, 2-speed countershaft; suip. £26.—8, St. Nicholas Rd., Brighton. [3799]

BRAND New Model 2½ h.p. 2-speed New Imperial-Jap; £42, no offers.—Clarke, 12, Queen St., Louth. [3867]

NEW Imperial—All models for immediate delivery.—J. A. Stacey, Sole Agent, 12, Ecclesall Rd., Sheffield. [X1545]

1919 New Imperials in stock; exchanges quoted.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [3754]

NEW Imperials, sole London agents.—2½ h.p. 2-speed 1919 models in stock; trade supplied.—Reys, Euston Rd. [2973]

THE H.C.M. MOTOR CO

Have the following Machines for disposal:

63. **ARIEL**, 1919, 4 h.p., 3-sp., c/shaft, kick-start, clutch. Just delivered, new £80
101. **AUTO-WHEEL**, 1916, 1½ h.p., with Triumph best 3-sp. model Gent's Cycle. Whole lot as new 19 gns.
102. **ALP**, 1914, 1½ h.p., lightweight, single-speed, Bosch mag., just overhauled 18 gns.
105. **ENFIELD**, 1916, 3 h.p., 2-speed, kick-start, clutch, as new 43 gns.
87. **HUMBER**, 1914, 2½ h.p., 2-cyl., single-speed T.T. model, just overhauled 26 gns.
78. **INDIAN**, 1915, 7-9 h.p., 2-sp., special W.O. Model, completely overhauled, kick-start, clutch 47 gns.
11. **JAMES** Combination, 1918, 5-6 h.p., new machine, 3-speed, countershaft, de luxe Sidecar £104 0
73. **JUNO**, 1918, 4 h.p., 3-speed Sturmev-Archer countershaft, J.A.P. engine, new machine; just delivered 69 gns.
103. **O.K. JUNIOR**, 1919, 2½ h.p., 2-speed, countershaft, new machine List price.
93. **MARTIN-J.A.P.**, 1914, 3½ h.p., o.h.v., single; one of Harry Martin's racing machines, specially tuned up, very fast 35 gns.
18. **PREMIER**, 1913, 2½ h.p., 3-speed, hub gear, clutch, fine order 29 gns.
61. **SINGER**, 1914, 3 h.p., 2-speed, countershaft, clutch, dropped frame 14 gns.
96. **TRIUMPH**, 1912, 3½ h.p., clutch model; good condition, overhauled 24 gns.
98. **TRIUMPH** Comb., 1914, 3½ h.p., 3-sp., clutch model, cane Sidecar; perfect order throughout 49 gns.
91. **T.D.C.**, 1912, 3½ h.p., Grado gear; mechanically perfect, enamel rough 19 gns.
104. **TRIUMPH**, 1911, 3½ h.p., single-speed, good condition 19 gns.
76. **ZENITH** Comb., 1914, 6-8 h.p., T.T., coach torpedo Sidecar; in fine order 69 gns.

CARS.

100. **ADAMS**, 1914, 16-20 h.p., 4-seat, self-start., hood, screen, detach. wheels; just overhauled. Perfect 349 gns.
106. **BEDELL** Cyclecar, 1912, 5 h.p., requires slight adjustment 19 gns.
56. **DARRACQ**, 1912, 15 h.p., 4-seater, hood, screen, detach. wheels with spare; all complete 149 gns.
75. **G.N.** Light Car, 1915, 10 h.p., 4-cyl., 3-sp. and reverse, gate change, 2-seat., just completely overhauled, and is as new 169 gns.
61. **MAUDSLAY**, 1914, 16-20 h.p., 4-seat., with detachable box body to fit in place of rear seats; in splendid order 270 gns.
2. **OAKLAND**, 6-cylinder, 1914, 40 h.p., dynamo light and start, Klaxon horn, detach. rims (2 spare), all tyres as new; just completely overhauled; English 5-seater body, back screen, every accessory 475 gns.
60. **STELLITE** Light Car, 1915, 8 h.p., 2-sp., 4-seater body, dynamo lighting, detach. wheels and spare, hood, and screen 315 gns.
107. **STUDEBAKER**, 1913, 20 h.p., 4-seat., Bosch mag., hood, screen; perfect order 179 gns.
1. **WEIGEL CHASSIS**, 1912, 45 h.p., 4-speed, gate, live axle, detach. rims (2 spare), make fine van 98 gns.

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MOTOR CYCLES FOR SALE.

New Imperial.

NEW Imperial-Jap, 2½ h.p., 2-speed, perfect order; £35.—Geo. Smith, Motor Cycle Depot, Clapham Junction, S.W. [3739]

NEW Imperial Combination, 8 h.p.; immediate delivery; 109 gns.—Exeter Motor Cycle and Light Car Co., Ltd., Bath Rd., Exeter. [0956]

2½ h.p. 1919 New Imperial-Jap, 2-speed countershaft 2 gear; £50/8; delivery from stock; first cheque secures.—Wauchope's, 9, Shoe Lane. [3972]

NEW Imperial Motor Cycles—2-speed standard and lady's models in stock for immediate delivery.—P. J. Evans, 91, John Bright St., Birmingham. [0956]

NEW Imperial-J.A.P., 1916, 2½ h.p., 2 speeds, reliable machine, in perfect running order; £36.—Loweth, 6, Mount Pleasant Rd., Ealing, W.5. [3861]

LATE 1915 2½ h.p. New Imperial-Jap, 2-speed, Miller's lamps, horn, and speedometer, in perfect condition, little used, like new; bargain.—H. Wilson, 66, West Sq., S. Farnborough, Hants. [4002]

1917 New Imperial-Jap, only used 3 months, as new, 2½ h.p., 2-speed countershaft, P. and H. lighting, all accessories; buying combination; £45.—Basnett, Canal Farm, Aeton Grange, Warrington. [X3729]

JONES' Garage, Agent for the New Imperial—8 h.p. combination in stock, £126; 2½ h.p. 2-speed models in stock, 48 gns.—The Broadway, Muswell Hill, N.10 (short bus ride from Finsbury Park or Highgate Tube). [4022]

SAVE Money by paying a good price for a reliable second-hand machine.—2½ h.p. New Imperial-Jap, 1916, 2-speed, clutch, kick starter, Lucas lamps, Gloria-phone, little and carefully used; £40; good for many years yet.—Lt. Hamilton, 5, Gordon Terrace, Newport, I.W. [X3566]

Norton.

NORTON 1919 Models and prices:

MODEL No. 1, 4 h.p., 3-speed, chain drive; £87.

MODEL No. 7, Brooklands special; £80.

MODEL No. 8, Brooklands road special; £73.

MODEL No. 9, Tourist Trophy; £63.

MODEL No. 16, countershaft, all-chain; £85.

DELIVERIES Commence February. Book your machine now.—Bathelot, Clarence St., Kingston. [3167]

1919 Nortons; cash or exchange.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [3757]

T.T. Norton, 1915, mileage 1,000, as new, speedometer; £55.—Box L9,167, c/o The Motor Cycle. [3716]

NORTON—Book your order now for the earliest possible delivery; exchanges.—Parker's, Bradshawgate, Bolton. [X3815]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new Nortons. [2266]

3½ h.p. T.T. Norton, 1916, extraordinary fast; exchange heavier machine, N.U.T. preferred; sale £52.—Dobson, 28, Prince St., Dalton-in-Furness. [X3562]

NORTON'S Big Four, model No. 1; will take your present mount in part exchange and allow full value; write to-day.—Bunting, 7, Mason's Av., Woldstone. [3986]

NORTONS—We are now booking orders for the latest model Nortons, solo and sidecar outfits; £5 deposit; deliveries in strictest rotation.—Maudes', 100, Gt. Portland St., London, W.1. [1442]

N.S.U.

N.S.U., 3½ h.p. Twin, sidecar, 2 speeds, mag., Seq-spray, good tyres, and running order; £25.—Reed, 346, Westborough Rd., Westcliff, Essex. [X3564]

N.U.T.

RIDER TROWARD and Co., 31, 40b, and 78, High St., Hampstead, sole agents for the N.U.T. 3½ h.p. twin 3-speed, dynamo lighting for the whole of London, Middlesex, Essex, Hertfordshire, Surrey, Sussex, Kent, and portions of Buckinghamshire and Berkshire. Orders now being booked for earliest delivery, and district agencies arranged. [3602]

O.K.

2½ h.p. O.K. Junior; £20.—Wauchope, 9, Shoe Lane. [3973]

RIDER TROWARD and Co., 31, High St., Hampstead.—O.K. Orders being booked for earliest delivery. [2271]

O.K., 1916, 2½ h.p., 2-speed; 25 gns. or exchange with cash for bigger power, Indian or Harley, not earlier than 1915.—64, Brownlow Rd., Willesden. [X3593]

JONES' Garage, agents for O.K. J.A.P.'s, having placed orders for these little mounts long ago, we will be able to deliver promptly, so let us have your order and get the mount you want in quick time.—The Broadway, Muswell Hill, N.10 (short bus ride from Finsbury Park, on Highgate Tube). [4024]

MOTOR CYCLES FOR SALE.

P. and M.

P. and M., R.A.F. model, and sidecar, in stock.—Mylam, 197, London Rd., Croydon. [3947]

P. and M., 3½ h.p., 1912, 2-speed, clutch, Binks with hot air intake, stored 2 years, overhauled by P. and M.; £25; in West Yorkshire.—Box 2,850, c/o The Motor Cycle. [X3646]

P. and M., 1914, 3½ h.p., 1917 gears, lamps, horn, speedometer, new tyres, excellent condition; bargain, £43, or nearest offer.—Can be seen, Macleod, 5, Cadogan Mansions, London, S.W. [3623]

P. and M., 1914, just been overhauled, re-enamelled, plated as new, war service colour model, new Dunlop tyres, new cylinder, piston, valves, etc., 2-speed free engine, kick start, absolutely as new; only wants seeing; £50, no offers.—Motorist, 136, St. Ann's Rd., Tottenham. [X3639]

Peugeot.

PEUGEOT 6h.p. Combination, 1914, Bosch mag., wicker sidecar, excellent condition; £25.—32, Woodside Rd., Kingston. [3953]

PEUGEOT, 6h.p., 2-speed, kick start, about 1913, new heavy Dunlop back, original enamel good, excellent mechanical condition, stored 2 years; bargain, £28/10.—6, Upper North St., Brighton. [3845]

Precision.

PRECISION, 1915, 2-speed, clutch, new tyres, like new.—172, Thorold Rd., Ilford, Essex. [3723]

PRECISION, 2½ h.p., free engine, practically new, a very sporty mount; £30, or near offer.—64a, Highbury Grove, Highbury Barn, N.1. [3714]

PRECISION 1913 4½ h.p. Combination, in running order; trial given; few spares; £18.—W. Hadley, 36, The Hale, Tottenham, London. [3949]

Premier.

7-h.p. 1914 Premier, as new, complete with sidecar.—61, Stockwell Park Rd., Stockwell, S.W. [4042]

PREMIER, 3½ h.p., 2-speed hub, mag., wants attention; £25, near offer.—20, Baladara Rd., Cardiff. [X3775]

3½ h.p. Premier and Sidecar, 3-speed gear, chain-drive, 32 belt drive; £35.—Lucas, Berrier, Monticeny shire. [X3245]

PREMIER, 2½ h.p., 3-speed; good as new; cash, or same and £40 for tip-top combination.—Claydon, Eastry, Kent. [3849]

3½ h.p. Premier and Handsome Coachbuilt Sidecar, 32 speed countershaft gear; £73/10.—Wauchope, 9, Shoe Lane. [3974]

3½ h.p. Premier, late 1913, 3 speeds, splendid condition; £38.—Hamby, 113, Longford Rd., Chorlton-cum-Hardy, Manchester. [X3725]

PREMIER, 1911, 3½ h.p., Grado pulley, Bosch, B. and B., good condition; £15, or exchange lighter machine.—White F. West, 160, Polkstone Rd., Dover. [3691]

1914 Premier, 3½ h.p., 3-speed countershaft and kick-start, in good order; £38/10.—Mr. Bates, 5, Canning Place, Denmark Hill, Camberwell, S.E.5. [3663]

3½ h.p. Premier, 3-speed countershaft, clutch, kick start, £42; 7-h.p. Premier, 2-speed, countershaft model, snip, £52.—Clapham (Motors), King George St., Greenwich. [X3753]

SPECIAL Model 1917 Premier Coachbuilt Combination, 3-speed, countershaft, kick start, head and foot clutch, 2 band brakes, as new, ridden 300 miles only, accessories, only needs seeing; £69.—Thorpe Whitehorse Rd., Thornton Heath, S.E. [3925]

Quadrant.

QUADRANT, mag., good order, sound; £9/10.—Hall, Auctioneer, Woburn, N.20. [3640]

QUADRANT, 4h.p., 1910-11, clutch, h.b.c., really powerful and reliable; seen after 7 p.m.; trial Saturday afternoon or Sunday; £15/10, or near offer.—Nicholson, 42, Southsea Av., Watford. [X3666]

Radco

RADCO, 2½ h.p., 2-stroke, T.T. splendid condition; £20, or exchange 3½ h.p. or 4h.p., with cash adjustment.—Wallis, 78, Leicha Rd., James St., Walthamstow. [3824]

Rex

1919 Rex; cash or exchange.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [3759]

5-h.p. Twin Rex de Luxe, 2-speed, in good condition; £30, or exchange for Scott.—A. R. Hill Lowe, Whitehaven. [3776]

£18.—Rex Coachbuilt Combination, 6h.p., 2-speed, Bosch mag., complete less front forks.—Speechley, 1, Gungersbury Lane, Acton, London. [3862]

4h.p. Rex, 1913, 2-speed, handle starting, lamp, speedometer, accessories, good tyres, only run 3,200, exceptional condition, perfect running order; £40.—Thorpe Brookside, Cranleigh, Surrey. [3789]

6h.p. Twin Rex, free engine, variable gear, Bosch mag., good tyres, Whittle belt, low, perfect order, excellent condition, B. and B. carburettor, coachbuilt sidecar, apron, accessories; bargain, £58/10.—45, Charles St., Commercial Rd., E. [X3766]



Two Stroke Ivy Policy for 1919.

"Specialisation"

Having now completed our Munition and Aero contracts, we desire to advise you that we are manufacturing for 1919 our well-known Two-stroke only in four models. We are discontinuing our Popular Models and concentrating solely on de Luxe productions, in order to give the Motor Cyclist the finest engineering product obtainable.

Our programme is—

2½ h.p. de Luxe "All-purpose" Two-stroke, Single-speed - - - £42

2½ h.p. de Luxe "All-purpose" Two - stroke, Two-speed Gear - - - £50

2½ h.p. de Luxe "Isle of Man" Sporting Two-stroke, Single-speed - £45

2½ h.p. de Luxe "Isle of Man" Sporting Two-stroke, Two-speed Gear - - - £53

Sporting Models have Special Engines and Disc Wheels.

Deliveries start end of March

To
Agents

The Ivy Agency will be in great demand. If your district is not covered write us, as we are now fixing up territory.

S. A. NEWMAN,
LTD.,
ASTON CROSS,
BIRMINGHAM.

THE
ARISTOCRAT
OF ITS TYPE

MOTOR CYCLES FOR SALE.

Rex-Jap.

REX-J.A.P. Combination, 1913, 8h.p., 2 speeds, handle starting, sidecar upholstered 1919, electric light; or exchange smaller h.p.—W.G., Pickwick House, London Rd., Strood, Rochester, Kent. [X3666]

Rover.

3½ h.p. Rover and Sidecar, Bosch, B. and B.; £25.—32 13, North St., Barking. [3946]

ROVER, 1913, free engine clutch, new Dunlops, Bosch; 18 gas.—Police Station, Billericay, Essex. [X3672]

ROVER Combination, 1914, 3-speed, beautiful condition, heavy Dunlops; £60; photograph sent.—20a, Pittsanger Lane, Ealing. [X3713]

1914 T.T. Rover, 3½ h.p., Philipson pulley, very little used, and as good as new, lamps, horn, etc.; any trial; price £45.—Abergele Motor Co., Abergele. [X3146]

ROVER, 3½ h.p., T.T., Philipson pulley, late 1915, in splendid condition, 2 lumps and generator, speedometer, Klaxon, fast and reliable; price £47/10.—Lt. Kayner, C.M.B. Base, Haslar, Hants. Tel.: Gosport 255. [3660]

ROVER, 1917, 3½ h.p., 3 speeds, countershaft, clutch, kick starter, with Rover coachbuilt sidecar, lamps, Klaxon, speedometer, tools, perfect order and condition like new; £90.—Box L9,202, c/o The Motor Cycle. [3811]

1912 Rover, 3½ h.p., running order, £17; 4h.p. J.A.P. engine, Bosch waterproof mag., B. and B., as new, £20, bargain; bench drill, self-feed, 50/-; 1917 3-stroke, stored 12 months, £22; stamp, reply.—Fidell, Springfield, Coleford, Somerset. [3666]

JONES' Garage are Rover agents, and can give you delivery, not in a month's time, but as from stock; 5-h.p. twin, £100; 3½ h.p. 3-speed, £85; 3½ h.p. T.T., Philipson, h.b.c., £72; 3½ h.p. T.T., £67.—The Broadway, Muswell Hill, N.10 (short bus ride from Finsbury Park, on Highgate Tube). [4025]

Royal Ruby

1919 Royal Ruby; cash or exchange.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [3758]

ROYAL Ruby, 2-stroke; order now for earliest deliveries of 1919 models.—Looganua, Fisherton St., Salisbury. [2559]

ROYAL Ruby, 3½ h.p., Bosch mag., B.B. carburettor, good tyres, new speedometer, perfect running order; £25, or offer.—P. Willcocks, Datchet, Bucks. [3735]

ROYAL Ruby.—Orders now being booked for earliest delivery; 2-strokes £40, 8h.p. combination £135.—Rider Troward and Co., 31, High St., Hampstead. [2902]

1917 2½ h.p. 4-stroke Royal Ruby, J.A.P. 2-speed gear box, lamps, Handphone, all spares, little used, practically new; £45.—Lieut. Bitwistle, Little Hallingbury, Bishop's Stortford. [X3693]

Rudge.

RUDGE, 3½-4h.p., perfect; first cheque £20.—Butlio, 26, Monney Rd., Tufnell Park. [3891]

RUDGE Multi, 3½ h.p., 1914, very fast, in perfect running order; 30 gas.—230, Brixton Rd., S.W.9. [3854]

RUDGE Multi, 5-h.p., sidecar, lamps, speedometer, spares, done 4,000, new condition.—Gudd, 14, Caledonian Rd., King's Cross. [3628]

RIDER TROWARD and Co., 31, High St., Hampstead.—Rudge-Multi, I.O.M. models only. Orders being booked for earliest delivery [2272]

1916 Rudge Multi, variable gears, clutch, recently overhauled Rudge works, all accessories; £50, or offer, quick sale.—A. K. Rayson, 35, King's Rd., Hammersmith. [3791]

RUDGE Multi, 1919, 3½ h.p., I.O.M. T.T. Model, new, never used, privately owned; owner buying car; complete with 25/5 speedometer, lamps, etc.; £87.—Hissey, Trevis Towers, Eastbourne. [X3692]

JONES' Garage, Rudge Agents.—Isle of Man models expected shortly; let us have your order; we will be prompt.—The Broadway, Muswell Hill, N.10 (short bus ride from Finsbury Park or Highgate Tube). [4023]

RUDGE Multi, 3½ h.p., 1914, and sporting torpedo sidecar, nearly new tyres all round, whole combination in almost new condition, and all accessories; £50.—Butterworth's Garage, 64, Mill Lane, Brixton Hill. [3836]

A Real Genuine Bargain, 1915 5-h.p. Rudge-Multi; 18 gas. Rudge sidecar, windscreen, beautifully upholstered, foot oil pump, new Dunlops; 4,000 miles; excellent condition; £70; exchange.—Holland, 28, Whitehall St., Bury. [3932]

Scott.

SCOTT, 2-stroke, 2-speeds; a bargain, £30.—Reilly, 215, Overgate, Dundee. [3944]

SCOTT 1912 Combination, in good order, lamps, speedometer, and accessories; 40 gas.—Moger, Rosemount, Ledbury, Herefordshire. [X3741]

SCOTT Motor Cycle, 1915, in perfect condition, been stored last two years; £55; approval.—Arnold, 45, Summerland Rd., Mincehead, Somerset. [X3620]

SCOTT Coachbuilt Combination, 2-speed, kick starter, water-cooled, Binks carburettor, quite new; 85 gas., bargain.—Rove, 95, Lower Addiscombe Rd., Croydon. [3817]

MOTOR CYCLES FOR SALE.

Scott.

SCOTT 1915 Combination, two-cyl., hood, screen, not used 2½ years, excellent condition; £70; exchange 3-wheeler or cycle car.—96, Chobham Rd., Stratford. [3852]

SCOTT, 1914, 4½ h.p. twin, water-cooled, solo or side-car machine, unused last 3 years, tyres as new, splendid condition; bargain, £40.—804, Seven Sisters Rd., S. Tottenham, N.15. [3960]

SCOTT, 4½ h.p., first-class condition, overhauled throughout, new crank case and piston, tyres and chains in new condition, not used 5 years; bargain, £37.—Capt. Millard, Devon House, Uxbridge. [3650]

SCOTT, 3½ h.p. twin, 2-stroke, 2-speed, kick start, late 1912, unused 2 years, re-enamelled, gear and crank case just overhauled by makers, new crankshaft bearings and chain sprockets, Binks carburettor, lamps, gear shields, horn, and tools; £35, or near.—Box 2,834, c/o The Motor Cycle. [X3634]

Singer.

SINGER, 3½ h.p., 1915, 3-speed Sturmer-Archer, excellent condition, not used 500 miles; complete £47.—James, 27, King St., Carmarthen. [X3177]

SINGER, 1913, 2½ h.p., 2-speed, clutch, Bosch, B. and B., cylinder and piston damaged; sell parts separately or together; what offers?—Robertson, 10, Dundhope Place, Dundee. [X3818]

Sparkbrook.

1914 Sparkbrook, 2-stroke, 2-speed, new tyre on back, splendid condition; £25.—68, High St., Crawley, Sussex. [3995]

SPARKBROOK, 2-stroke, 2-speed, 1917, with spare special heavy Bates tyre, scarcely used; £32; owner on service.—Lt. Grainger, Wyken Hall, Hinkley. [X3572]

SPARKBROOK, 1915, 2-speed, 2-stroke, first-rate condition, lamps, horn, spare chain and belt, tools; £30.—Harvey, Hurst Hall Estate Office, Saxmundham. [3826]

SPARKBROOK, 2-stroke, 2-speed, 2½ h.p., excellent condition, bought new in Dec. 1916, and only ridden for 2 months; 40 gns.—Goodman, Hamlet Gardens, Hammersmith. [3298]

Sun.

1914 Sun-Precision, T.T., 3½ h.p., mag.; 25 gns.—Wandsworth Motor Exchange, Ebner St., Wandsworth (Tova Station). [3937]

SUN V.T.S., 2-speed, F.E., new brake fitted, 2 tool-bags, and battery in leather case; £27/10; seen only time.—171, East Barnet Rd., New Barnet. [3648]

2½ h.p. 1916 Sun-Villiers, 2-stroke, Amac, Avon tyres, 2 in splendid condition; £29, a bargain, or exchange combination with cash.—66, Iron Mill Lane, Crayford, Kent. [3720]

Sunbeam.

1916 3½ h.p. Sunbeam, T.T. Bars, discs, mudshields, lamps, horn, splendid condition; £85.—Below.

1916 Sunbeam Combination, 8 h.p. M.A.G., lamps, horn, speedometer; £135.—Elce and Co., 15-16, Bishopsgate Av., Cannon St., E.C.3. [0551]

1919 Sunbeams in stock; exchanges quoted.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [3755]

SUNBEAM.—Immediate delivery of new models; exchanges; enquiries invited.—Parker's, Bradshawgate, Bolton. [X3814]

SUNBEAM Combination, 3½ h.p., 3 speeds, clutch, kick starter, stored since 1916, in exceptional condition; 70 gns.—Loweth, 6, Mount Pleasant Rd., Ealing, W.5. [3925]

FOR Sale, 3½ h.p. Sunbeam, new October 1915, in use two seasons, tyres just renewed, guaranteed perfect order; offers wanted; see Wants. advt.—Reed, New York, Northumberland. [3930]

1916 3½ h.p. T.T. Sunbeam Combination, 3-speed, clutch, kick start, disc wheels, very good condition, complete with lamps, horn, etc.; £95, or part exchange higher powered machine.—51, Broad St., Rose-on-Wye. [X3767]

SUNBEAM 8 h.p. Combination, Lucas electric lighting set, hood, screen, electric horn, and spare wheel, delivery next month; full value allowed for any motor in part exchange.—Bunting, 7, Mason's Av., Wealdstone. [3987]

A BARGAIN, 1914-15 3½ h.p. Sunbeam combination Gloria sidecar, windscreen, beautiful condition, tyres practically new; mileage 3,000; guaranteed; first cheque £95 secures.—Holland, 23, Whitebull St., Bury. [3933]

1916 Sunbeam, 3½ h.p., 3-speed, free engine, kick starter, speedometer, front and rear Lucas lamps, watch, horn, pump, waterproof overalls, etc., little used owing to petrol restrictions; £70, or near offer.—George Delahoy, 24, Park Rd., Spalding. [3704]

1916-17 Sunbeam 3½ h.p. Combination, sidecar new, Lucas electric lighting, with spare accumulator, speedometer, watch, and mirror, 2 tools, tyres good and unpunctured, machine just overhauled, condition guaranteed perfect and appearance as new, complete and luxurious outfit; seen after 6.30, or ride 50 miles week-end; £110, offers considered.—Guest, 5, Barnsley Rd., Edgbaston, Birmingham. [X3571]

Triumph.

4 h.p. Triumph, 3-speed model, 1914; £47/10.—Wauchope, 9, Shoe Lane. [3975]

TRIUMPH, countershaft, 1919; early deliveries; £87.—Longman, Fisherton St., Salisbury. [2360]

SPECIAL OFFER THIS WEEK

Latest 1919 B.S.A.,

4½ h.p., chain and belt drive.

Price 76 gns.

Book your order now for early delivery of any of the following machines:

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Biggest Light Car and Motor Cycle Dealers in the South.

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No rubbish offered or wanted.

COMBINATIONS.

1917 8 h.p. SUNBEAM Combination, M.A.G., spare wheel, Lucas dynamo lighting, condition as new £160
1918 3½ h.p. N.U.T. Combination, 3-sp. countershaft, kick-starter, hand clutch; very sporty, only done 100 miles £95
1916 Powerplus INDIAN Combination; mileage 500 £105
1916 B.S.A. Combination, very good order £65

SOLOS.

1917 3½ h.p. SUNBEAM, W.D. model, lamp set, all accessories £85
1916 3½ h.p. SUNBEAM, disc wheels, lamp set, speedometer, Klaxon, semi-T.T. bars £80
1915 T.T. 2½ h.p. DOUGLAS, splendid condition £45
1916 Baby TRIUMPH, almost new .. £45

CARS.

1914 SINGER, 10 h.p., Rotax dynamo lighting, very good order £220
Special sporting SINGER, outside exhaust pipes, fish-tail back, dynamo lighting, very fast £250

J. SMITH & CO.,
16, HAMPSTEAD ROAD, LONDON, N.W.1.

MOTOR CYCLES FOR SALE.

Triumph.

2½ h.p. Baby Triumph, only ridden a few miles; £47/10.—Below.

NEW 4 h.p. Countershaft Triumph in stock; £87.—Elce and Co., 15-16, Bishopsgate Av., Cannon St., E.C.3. [0552]

1919 Triumphs in stock; exchanges quoted.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [3762]

TRIUMPH, 1914, clutch, tyres and belt new, engine recently overhauled; £37.—367, Church Rd., Leyton. [3635]

TRIUMPH Spares in Stock.—W. Brandish, Triumph Garage, 625, Foleshill Rd., Coventry. 'Phone: 1050. [X3369]

TRIUMPH, 1912, 3½ h.p., grand condition, 1916 improvements; £25.—29, St. Leonards St., Bromley-by-Bow. [3886]

TRIUMPH 4 h.p. Countershaft Model in stock.—Mylam, 197, London Rd., Croydon. 'Phone: 2379. [3948]

TRIUMPH.—Delivery from stock new 4 h.p. countershaft models; exchanges.—Parker's, Bradshawgate, Bolton. [X3809]

1914 4 h.p. Triumph, 3-speed Sturmer-Archer, good extra heavy Dunlop tyres; 42 gns.—Rose's Garage, Uxbridge. [3917]

TRIUMPH, 1919, 4 h.p., latest model, just delivered; first cheque secures, £87.—Grey's Garage, Beaconsfield. [3847]

FOR Sale, 1913 3½ h.p. Triumph, 3 speeds and clutch, equal to new, not used during war; £35.—The Supply Stores, Strabane. [X3195]

TRIUMPH, 1914, 3½ h.p., 3-speed model, in excellent condition; £38.—Longman Bros., 2, King's Parade, Acton. Tel.: 1578 Chiswick. [4029]

3½ h.p. Triumph, £26; sidecar, £5; both new condition, ride away; exchange entertained.—Wright, 113, Blair St., Poplar, London. [3879]

TRIUMPH-ENGINEED Rover, 5 h.p., very hot stuff, and sporty appearance; £20; exchange for good 2-stroke.—68, High St., Crawley, Sussex. [3907]

TRIUMPH, 3½ h.p., T.T., as new, guaranteed perfect running order, with accessories; bargain, £28.—After 6 p.m. at 7, Ravenhurst Av., Hendon. [X3755]

RIDER TROWARD and Co., 31, High St., Hampstead.—Triumph, delivery February, 4 h.p., £87. Orders being booked for 2-stroke, earliest delivery. [2273]

LATE 1915 T.T. Triumph, 3½ h.p., climb anything, lamps, accessories, condition perfect; £48, or nearest offer.—G., Ivy House, Burton Latimer, Kettering. [X3719]

TRIUMPH, 1913, 3½ h.p., 3-speed, clutch, sporting wicker sidecar, nearly new tyres, perfect condition, ride away; £45.—48, Temple Sheen Rd., East Sheen. [3712]

TRIUMPH, 1914, 3-speed clutch model, Bosch ignition, stored during war, almost new; £38; to be seen by appointment.—H.J.B., 10, Pembroke Mews, W.8. [3846]

TRIUMPH, 3½ h.p., late 1913 clutch model, mileage 2,500, Cowey speedometer, Lucas lamps, horn, stored since 1914; £30.—Capt. Dickinson, Estcourt, Heene Rd., Worthing. [3860]

TRIUMPH, 1913, 3½ h.p., free engine, 3-speed, Bosch mag., 2 massive lamps, horn, Klaxon hooter, speedometer, X'All saddle, excellent condition; offers.—H., 13, Montague St., Worthing. [X3765]

TRIUMPH 1910 3½ h.p. Model, new Bosch water-tight mag., drip feed lubrication, excellent condition; £23.—Longman Bros., 2, King's Parade, Acton. Tel.: 1578 Chiswick. [4030]

TRIUMPH, 1914, 3-speed, clutch, mileage 500, plating, enamel, tyres as new, unspratched condition; £50, nearest offer; stored whole war.—Lt. Hellett, 8, St. Nicholas Rd., Brighton. [3797]

TRIUMPH, 1916, countershaft 3 speeds, coachbuilt sidecar, nearly new, lamps, tools, spares; good reason for selling; highest offer accepted.—Palmer, 61, Commercial Rd., Waterloo, S.E.1. [3772]

TRIUMPH, 1919, 4 h.p., 3-speed countershaft model, just arrived from works, now actually in stock; £87; first one secures.—Wilkins, Simpson and Co., 11, Hammersmith Rd. (opposite Olympia), London. [3376]

TRIUMPH, 1914, 4 h.p., Sturmer-Archer 3-speed, all tools, spares, and accessories, with 1917 20 ga. Gloria sidecar; £50; can be seen and tried any time.—Wood, 1, Broomhill Rd., Goodmayes, Ilford. [X3744]

TRIUMPH and Sidecar, 1913, Sturmer 3-speed, lamps, tools, new tyres, perfect mechanical condition, enamel, plating poor because stored during war; genuine bargain, £38.—Fenn, 129, Castellain Mansions, W.9. [3751]

TRIUMPHS.—Longman Bros., 2, King's Parade, Acton. Tel.: 1578 Chiswick. We have several first-class second-hand Triumphs from 1910 to 1914; also we are booking for the post-war model early deliveries. [4051]

1915 2½ h.p. Triumph Junior, 2-speed gear, Miller lamps, mechanical horn, brand new Clincher tyre on back wheel, condition perfect, climb anything; bargain, £45.—H. Massey, 19, Station Lane, Wornthley, near Barnsley. [X3647]

MOTOR CYCLES FOR SALE.

Triumph.

COMMERCIAL'S cross-country 1912 fixed Triumph, grand engine, fast and flexible, appearance good, new tyre, other and belt good; first £23 secures, or exchange recent 2-speed lightweight.—77, Birkbyhall Rd., Huddersfield. [3985]

JONES' Garage, Triumph agents, and contracts placed; one model H in stock, £87; others expected and promised in March.—The Broadway, Muswell Hill, N.10 (short 'bus ride from Finsbury Park, on Highgate Tube). [4026]

31 h.p. Triumph, engine No. 9,382, Bosch mag., 32 plating and enamel like new, new back tyre, the original one on front, not used for 4 years, carefully stored, lamp, tools, etc.; £30, or exchange with cash for 7-h.p. 2-speed Indian spring frame or 7-h.p. F.N.—R. S. Andrews, The Limes, Out Northgate, Bury St. Edmunds, Suffolk. [X3728]

Victoria.

19 15 2-speed 2-stroke Victoria, very little used, fine condition; £21.—The Supply Stores, Strabane. [X3191]

Vindec.

VINDEC Special 5h.p. Twin, 2-speed Roc gear, handle starting, Bosch magneto, and sidcar, in splendid mechanical order; £18, bargain.—Butterworth's Garage, 64, Mill Lane, Brixton Hill. [3838]

Williamson.

WILLIAMSON, 8h.p., water-cooled, sidcar, 2-speed; £85.—79, Park Hill, Clapham. [3916]

19 19 Williamson; cash or exchange.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [3761]

Win-Precision.

WIN-PRECISION, 3½ h.p., 1912-1913, fixed gear, good tyres and belt, machine in appearance similar to a Triumph; £24.—Butterworth's Garage, 64, Mill Lane, Brixton Hill. [3839]

Wolf.

21 h.p. Wolf, U.H. mag., Seaspray carburettor, splendid condition; bargain, 16 gns.—76, Western Rd., Southall, W. [3990]

Wooler.

JONES' Garage are appointed agents for the new Wooler, 2½ h.p. horizontal twin with spring frame and also other attractive features; £59; let us have your order, it is good; show model expected shortly and deliveries in March.—The Broadway, Muswell Hill, N.10 (short ride from Finsbury Park on Highgate Tube). [4027]

Zenith.

31 h.p. Zenith and Sidcar, Gradua gear; price £35.—Wanchoupe, 9, Shoe Lane. [3967]

FOR Sale, Zenith-Gradua 3½ h.p. combination; expert examination allowed.—97, New Rd., Grays. [X3735]

ZENITH, 1916, 5½ h.p., and Canoelet sidcar, hardly used, like new; £85.—Hubert, 9, Ormonde Rd., East Sheen, S.W. [3699]

19 15 Zenith Combination, 8h.p., practically new, spare tube and belt; £90.—Letters 2, Church Hill, Walthamstow. [X3671]

ZENITH-GRADUA, 3½ h.p., and wicker sidcar, tyres and belt perfect, lamps; £36/10, snip.—261, Mitcham Lane, Streatham. [3903]

RIDER TROWARD & Co., 31, High St., Hampstead.—Zenith-Gradua, new models, delivery this month; prices on application. [2274]

ZENITH, 8h.p., kick-start, coachbuilt sidcar, new condition; £70; exchange 3½ h.p. and cash.—29, St. Leonards St., Bromley-by-Bow. [3890]

ZENITH, 8h.p., 1915, countershaft, clutch, coachbuilt sidcar, C.A.V. lighting set, excellent condition; £75.—Don, Mon Abri, New Malden. [X3614]

4 h.p. Zenith-Gradua, 1912, Bosch, new Dunlop and belt, T.T., excellent condition, lamps, horn, £50, or offer.—H., 16, Tuscan Rd., Plumstead. [3638]

ABSOLUTELY as New 8h.p. Zenith Combination, unscratched, mileage about 1,000; £100; exchange entertained.—Wright, 113, Blair St., Poplar, London. [3878]

ZENITH-GRADUA 1914 5h.p. Combination, running parts in excellent condition, powerful, fast, G.B. sidcar, very genuine turnout; 40 gas.—White, Castle Hill, Cuckfield, Wits. [X3774]

ZENITH, 1917, 8h.p. J.A.P., Gradua countershaft gear, lamp, tools, etc., kick start, splendid running order; £85.—Captain Keller, R.A.F., Mill Farm, Earsley, near Chichester. [X3659]

ZENITH, 1917, purchased Dec., 1918, 6h.p. twin, Gradua gear, K.S., full accessories, everything like very best, not done 500 miles, like new; £70; must sell.—Box 2, 847, c/o The Motor Cycle. [X3680]

ZENITH Combination, 4½ h.p., 1914-1915, twin, sporting coachbuilt sidcar, countershaft model, guaranteed condition, with accessories; £65.—Butterworth's Garage, Mill Lane, Brixton Hill. [3837]

ZENITH 1914 5h.p. Twin, winner of 1,000 c.c. hill climb in 1914, and not used since 1916, done about 4,000 miles only, fast machine, T.T. bars; £35, no offers.—Rostera, Prestwylch, Dene Rd., Northwood. [3783]

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26x2½ special heavy	30/-	58/-
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26x2½ heavy diamond studded .	28/6	Pre-
26x2½ " " " " " "	41/5	war
28x3 " " " " " "	61/-	Prices.
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26x2½x2½ heavy non-skid	35/-	60/-
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(For Indian machines.)		

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26x2½x2½ heavy anti-skid	30/-	57/6
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Cannot advertise name.		
700x30 heavy 3-ribbed	50/-	71/3
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Bikes, Goodyear, Firestone, etc.		
26x2	6/-	8/9
26x2½	6/9	10/-
26x2½	7/-	11/-
26x2½	8/-	11/6
26x2½	8/6	12/6
Butted same price as Eadless.		

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All makes in stock at Special Prices.

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Extra heavy rubber studded	17/5
Heavy rubber studded	15/-
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Time required, 7 days from receipt of cover.	



321 High Road, Streatham, S.W. 16.

264 Vauxhall Bridge Road, S.W. 1.
Victoria,

MOTOR CYCLES FOR SALE.

Zenith.

ZENITH 1917 Combination, 8h.p. J.A.P. engine, countershaft clutch model, fitted 3in. tyres, speedometer, lamps, horn, spares, mileage 4,000, in good condition; can be driven away; £85, or nearest offer.—Hughes, 69, Week St., Maidstone, Kent. [X3561]

Ladies' Motor Cycles.

19 16 Lady's 2-stroke Calthorpe, 2-speed, not ridden 500 miles, excellent condition; bargain, 30 gns.—"Glynol," Woodlea Rd., Worthing. [3752]

Miscellaneous.

JONES' Garage.—1919 Victory Model Matchless, spare wheel, all wheels detachable and interchangeable; £140.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1919 New Imperial combinations, 3-speed and hand-controlled clutch; £126.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1919 Model K B.S.A.; £79/16.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1919 3½ h.p. Ariel, 3-speed and clutch; £80.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1919 New Imperial lightweight; 48 gns.—Broadway, Muswell Hill, N.10.

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JONES' Garage, short 'bus ride from either Finsbury Park or Highgate Tube Railway.

JONES' Garage.—1916 semi-T.T. 3h.p. Enfield, as new; £55.—Broadway, Muswell Hill, N.10.

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JONES' Garage.—1914 Zenith-Gradua, 3½ h.p.; £45.—Broadway, Muswell Hill, N.10.

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JONES' Garage.—1913 3½ h.p. New Hudson and sidcar, 3-speed and clutch, all lamps, etc., in very nice order and condition; £35.—The Broadway, Muswell Hill, N.10.

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JONES' Garage.—1917 Allon, 2-speed and handle-bar controlled clutch, fitted with light sidcar, absolutely like new; £52/10.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1917 3½ h.p. James, 3-speed countershaft, h.b.c. clutch, absolutely like new; £75.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1917 2½ h.p. New Imperial, 2-speed, as new; £45.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1916 8h.p. Excelsior-Jap combination, Sturmer-Archer 3-speed countershaft gear, dynamo lighting (Lucas), lovely coachbuilt sidcar, a beautiful outfit; £105; like new.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1914 T.T. Triumph, 4h.p.; £50.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1919 Matchless combination, fitted with Lucas lamps, new; £145.—Broadway, Muswell Hill, N.10.

JONES' Garage will be pleased to give further particulars of any machine or machines upon request.

JONES' Garage.—Lists upon application.—Broadway, Muswell Hill, N.10. [4028]

SUN-VILLIERS, 1915, 2-speed, 2-stroke, done 700 miles, £25; free engine Triumph, 3½ h.p., 1913, £22/10.—Andrews, 154, Main St., Tweedmouth. [X3667]

REN 5-6h.p. Motor Cycle and sidcar, with accessories and spare tube, handle start, clutch, tyres and belt good, £14; also original N.S.U. in good condition, pedal start, £4/10; owner going abroad.—"Layreach," Pitlochry, Perthshire, N.B. [3771]

ISLE OF WIGHT Motor Cyclists should see William Bros, 139, High St., Newport, about their new mount. Earliest deliveries of Allon, A.J.S., Ariel, Clarno, Lewis, Triumph, etc. Catalogues on request. Prompt repairs by skilled mechanics. Full range of tyres and accessories. [3690]

NEW 1919 Models.—We are accepting orders for B.S.A., Bradbury, Douglas, New Imperial, Norton, Royal Ruby, Rex, Sunbeam, Triumph, Lewis, Williamson motor cycles, and G.W.K. and Calthorpe light cars, for earliest possible delivery.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [3763]

RIDER TROWARD and Co., 31, 40b, and 78, High St., Hampstead, have always a very large stock of second-hand motor cycles, lists free. It is impossible to publish the full list every week, and intending purchasers are well advised to call. The Hampstead depot is one minute's walk from Hampstead Tube Station, and is open every day, including Saturday and Sunday. [3695]

MOTOR CYCLES FOR SALE.

Miscellaneous.

THE H.O. Motor Co., 347, Finchley Rd., N.W.3.
have the following machines for disposal:

JUNO, 1918, 3½ h.p. J.A.P., Sturmey-Archer counter-shift gear, new machine; 69 gns.

ENFIELD, 1915, 3 h.p. twin, Enfield gear, perfect order; 37 gns.

PREMIER, 1913, 2½ h.p., 3-speed, clutch, pedal start, just overhauled; 27 gns.

ZENITH Combination, 1914, 6-h.p. J.A.P., sporting coach sidecar, perfect; 69 gns.

INDIAN, 1915, 7-h.p., 2-speed, kick, clutch, just thoroughly overhauled; 49 gns.

T.M.C., 10 h.p., 4-cyl. 3-speed, spring back and front, just completely overhauled, with sidecar chassis; 49 gns.

T.D.C., 3½ h.p., Grade gear, Bosch, good order; 19 gns.

AUTO-WHEEL, 1915, fitted to Triumph 1916, best 3-speed gear gent's cycle, perfect order; 19 gns.

SINGER, 1914, 3 h.p., open frame, 2-speed, kick clutch; 34 gns.

ARIEL, 4 h.p., new machine, just down from makers £80

HUMBER, 2½ h.p., 1914, twin, single speed, good order; 24 gns.

TORPEDO, 1914, 2½ h.p., 2-speed, Precision engine. 22 gns.

A.L.P., 1½ h.p., 1913, perfect order, Bosch mag.; 18 gns.

MARTIN-J.A.P., 3½ h.p., c.h.v., one of Harry Martin's racers, very fast, and perfect throughout; 35 gns

THE H.O. Motor Co., 347, Finchley Rd., N.W.3.
Phone: Hampstead 4631. Open Saturday afternoons and Sundays. [3583]

RUDGE, 1913-14, 29 gns.; Indian, 1914, 7-h.p., 35 gns.—245, Hammersmith Rd., W.6. [3823]

1912 Clyno, 5-h.p., 35 gns., combination; 1911
Sarolea, 5-h.p. twin, 12 gns.—895, Fulham Rd.
8.W. [3822]

NEW Models in Stock—3½ h.p. P. and M. combina-
tion, £102; 2½ h.p. 2-speed New Imperial, £50;
Enfield, 2½ h.p., 2-stroke, 2-speed, £52/10; Royal
Ruby, 2½ h.p., 2-speed, £50; Radco, 2½ h.p., 2-stroke,
fitted with lamps, horn, etc., as new, £25; Ariel,
3½ h.p., perfect, fitted complete, £25; Sunbeam, 3½
h.p., 3-speed, kick starter, and sidecar, electric, fitted
Lucas lamps, horn, speedometer, equal to new, £100,
only wants seeing.—Hebden's Motor Mart, St. James's
St., Burnley. Tel.: 488. [3953]

BODIES.

BASTONES for Sidecar Bodies.—Several light
wicker and coachbuilt bodies; also tandem
and torpedo bodies at clearance prices.—228, Penton-
ville Rd., King's Cross, London, N.1. [2780]

SIDECAR Body Designs for the trade only. Work-
ing, coloured, pencil, or line drawings of original
designs, also working drawings full sized or to scale.—
Cooper's Vehicle Journal, Ltd., established designers to
the coach trade for over 80 years. Consult us when de-
signing new ideas.—20, Tudor St., London, E.C.4 [0818]

SIDECAR ATTACHMENTS.

SIDECARS, coachbuilt touring and sporting bodies.—
Sidecar Works, 895, Fulham Rd., S.W. [3222a]

BASTONES' for Sidecars at low prices.—228, Penton-
ville Rd., King's Cross, London, N.1. [2779]

WATSONIAN Lightweight Sidecar, nearly new;
£7.—436, Whitehorse Rd., Thoroton Heath, S.E. [3926]

RUDGE Coach Sidecar, in good condition, with open
seen by appointment.—Kingston Hall, Harlow,
Essex. [X3599]

MONTGOMERY Wicker Sidecar, side door, luggage
end, as new; £5.10.—H.S., 35, St. Stephen's Rd.,
Bow, E. [3767]

CLEARANCE Lines; several cane sidecars, splendid
value, stock-soiled only.—The Willowbrook Co.,
Leicester. [0901]

B.S.A., Mills-Fulford coachbuilt sidecar, luggage
carrier, perfect; £11.—Allen, Mellor House, Edin-
ware. [3944]

BRAMBLE Coachbuilt Sidecar for sale, splendid con-
dition; £9.9, or nearest offer.—Barnes, Broadlands,
Chesham, Bucks. [3780]

NEW Rally medium weight touring models in stock
for immediate delivery.—Rider Troward and Co.,
31, High St., Hampstead. [3606]

WATSONIAN Lightweight Sidecar for sale, new con-
dition; £7.10.—Lester, 10, Hanway Place, Han-
way St., Tottenham Court Rd., W. [3710]

SHOP-SOILED Gloria Commercial Sidecar, Model 6,
14 gns.; also extra strong and large box sidecar
£6/10, offers.—Smith, 27, Prince's Av., Hull. [X3594]

SIDECARS and Chassis, touring, tradesmen's, and
sporting models; good variety; deliveries from
stock.—Burbury Sidecar Works, Farm St., Birmingham
[3851]



We can give

Immediate Delivery

of the following

MOTOR CYCLES.

ALLON, ARIEL,
BLACKBURN, B.S.A.,
DOUGLAS, JAMES,
MATCHLESS, NEW
IMPERIAL, TRIUMPH,
ROYAL ENFIELD.

The machines enumerated below, for
which we hold Agencies, will also be
available shortly, and we are booking
orders for delivery in strict rotation—

A.B.C., A.J.S., BROUGH,
CLYNO, DIAMOND,
HENDERSON, N.U.T.,
NORTON, P. & M.
ROVER, ZENITH.

SIDECARS.

CANOELET, MILLFORD,
SWAN.

EXCHANGES
— ARRANGED. —

The following is a selection of our

Second - hand
Motor Cycles.

We will send full particulars to all enquirers.

ROYAL RUBY, 1916, 2½ h.p., 2-stroke .. £28
TRIUMPH, 1909, 3½ h.p., Tourist Model . £16
OVERSEAS, 1914, 3½ h.p., Tourist Model £32
ALLON, 1916, 2½ h.p., 2-stroke, 2 speeds,
and clutch £42
TRIUMPH, 1912, 3½ h.p., clutch model,
and Philipson pulley £35
CHATER-LEA, 1916, 2½ h.p., 2-stroke,
2 speeds £32
ZENITH, 1916, 8 h.p., Gradua gear, and
free engine £67
BROUGH, 1916, 3½ h.p., 3 speeds,
countershaft gear, lamps, and horn £60
SERVICE, 1915, 2½ h.p., 2-stroke, 2 speeds £26
PREMIER, 1913, 3½ h.p., 3 speeds £36
ROYAL ENFIELD 1916 6 h.p. Combina-
tion, lamps, horn, and speedometer .. £85

Deferred Payments accepted for either New
or Second-hand Machines.

EASTERN GARAGE Co.,

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SIDECAR ATTACHMENTS.

RENNOC Sidecars are manufactured at the Rennoc
Motor Sidecar and Engineering Works, 86, Vic-
toria Rd., Strand Green, London, N.4.

RENNOC Sidecars are designed and manufactured
under the personal supervision of Mr. George
Coburn.

RENNOC Sidecars.—We supply lugs, rims, spokes, ni-
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ments for any make sidecar.

RENNOC Sidecar Bodies, hoods, screens, wheel
discs, etc., actual manufacturers, wholesale, re-
tail, and export.

RENNOC Sidecars.—We specialise in frame repairs to
motor cycle and sidecars.

RENNOC Sidecars.—Special department for sidecar
body repairs, repainting, upholstering, lining, etc.

PHOENIX Sidecars.—The Rennoc Co. can supply all
spares and undertake repairs for this make.

RENNOC Sidecars.—14 models to fit all motors;
tandems a speciality.

RENNOC Sidecars.—We can give immediate delivery
of all models.

RENNOC Sidecars to suit Harley, Yale, Indian, Ex-
celsior, Pope, and all American models.

RENNOC Sidecars specialise in motor cycle and
sidecar frame repairs, enamelling and plating.

RENNOC Sidecars are actual manufacturers of
hoods, screens, and wheel discs.

RENNOC Sidecars have always in stock second-hand
and clearance sidecars; special list.

RENNOC Sidecars have in stock 17 different de-
sign bodies to suit old and new pattern chassis.

RENNOC Sidecars advise you to place your present
sidecar with us to be overhauled, we have a
special department.

RENNOC Sidecar Works, 86, Victoria Rd. Tolling-
ton Park, Stroud Green, London, N.4. [3554]

SIDECAR, coachbuilt, good condition, suit about
4 h.p. machine, £15/15; another £13/13.—Geo.
Smith, Motor Cycle Depot, Clapham Junction, S.W. [3737]

SPORTING Canoelet Sidecar, coachbuilt, hammock
seat, extra light, by Mead and Deakin, beautiful
condition, complete; sacrifice £9.—Else, Dimple, Mat-
lock. [X3731]

NEW Empire Coachbuilt Sidecars, to fit B.S.A.,
Triumph, and Douglas machines; prices
£27/10/3, £18/4, and £16/2 respectively.—Wanchope,
9, Shoe Lane. [3968]

BUTTERWORTH'S Garage have several second-hand
light sidecar chassis, with wheels and springs,
some want couplings to complete, for sale cheap.—
Mill Lane, Brixton Hill. [5840]

HANDSOME Cane Sidecar, Millford chassis, apron,
wind screen, foot goag and luggage carrier; cost
£17, first cheque for £10 secures, bargain.—22, Banks
Av., Meols, Hoylake, Cheshire. [X3588]

CANOELET Coachbuilt Sidecar, good condition, £5,
lowest; Phoenix sidecar, coachbuilt, upholstering
slightly torn, otherwise perfect, £4/10, no offers; can
be seen week-ends or evenings.—91, Maplestone Rd.,
Dalston, E.8. [3644]

NEW High-class Underslung Sidecar Chassis, for
Harley-Davidson and American Excelsiors, 28x3
wheel, £6/15; new wicker body, with apron, 18/-; new
coach bodies, £4/15 and £5/15; new medium weight
sidecars, to fit any leading English make, on rails in
crate, £12/10.—Hullifax Motor Exchange, 18a, Union
St. South, Halifax. [3765]

TRICARS FOR SALE.

TRICAR, unfinished, 2-speed, chain drive, 8 h.p. water-
cooled; £15.—Buckley, 248, Haughton Green,
Deaton, Manchester. [X3743]

RUNABOUTS AND CYCLE CARS.

MORGAN, 1914, sporting model, fawn, excellent con-
dition; cheap.—A. J. Bond, Somerton, Som. [3815]

8 h.p. J.A.P. Sporting 3-wheeled Runabout, good con-
dition; £50.—33, Wiltshire Rd., Brixton, London. [3920]

DE DION, 5½ h.p., w.c., 3-wheeler; £20, or exchange
good 3½ h.p. cycle.—Letters, c/o Ede, 33, Manor
Rd., Wallington. [3692]

3-WHEEL Cycle Car Chassis, water-cooled power
unit, radiator; £25, or nearest.—Boyack, 90,
Albert St., Dundee. [X3736]

1914 Swift Cycle Car, 7-h.p., just overhauled, good
condition, lamps and accessories; £100.—Bowhill,
New St., Holt, Norfolk. [3828]

6 h.p. W.C. 3-wheel Runabout, 2 speeds, clutch,
complete less mag., make good cycle car; £12.—
13, North St., Barking. [3945]

2-SEATER Cycle Car, 8-10 h.p. Blumfeld, 3 speeds,
reverse, hood, screen, etc.; £80, or near; exchange
considered; seen after 5 p.m.—27, Imperial Rd.,
Beeston, Notts. [X3748]

CYCLE Car, 8 h.p. twin, 3 speeds, 2-seater, 3-wheeler,
one of the smartest built, wants a little adjust-
ment; price £45, or nearest offer.—G. Frith, Whiston,
Tidswell, Buxton. [X3734]

THE MOTORCYCLE

ESTABLISHED IN 1903

AND FOR OVER SIX YEARS THE ONLY PAPER SOLELY DEVOTED TO THE PASTIME

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The "All-weather" Motor Cycle.

OLD usages die hard, whether ridiculous in their application or not, and a case in point connected with the riding of motor cycles is the unjustifiable employment of the term "season." At all times of the year, in the cold days of January and in the broiling heat of August, the motor cycle is to the pleasure-seeker a pleasure and to the business man a boon.

"Many things by season, seasoned are to their right praise and true perfection," says Shakespeare, and, if in high summer the motor cycle is the best appreciated, it is no reason why we should continue to talk of motor cycling as if it were indulged in only during that particular period. The abolition of the term needs no greater justification than recent events provided. Whilst the Tube strike was in progress, hundreds of motor cycles helped in a small way to relieve the transport between the suburbs and the city. During the last spell of frost, too, the sidecars both for pleasure and business were much in evidence. At week-ends in the neighbourhood of big towns motor cycles are as numerous as motor cars.

True sport and real pleasure may be experienced in the rush of the biting wind, as well as in the soft breezes of summer; variety is the spice of life, even in motor cycling.

Neither is this "all-the-year-round" riding confined to the male sex. A sign of the times is observable in the keen enthusiasm of lady motor cyclists and sidecarists in every kind of weather.

It is from the riders who scorn to store their machines in winter that one gets the reasoned and sound criticism of weatherproofing, and it must be admitted that constructive criticism is the most effective way of drawing manufacturers' attention to riders' wants.

If the few motor cyclists who coddle their machines and themselves would brave the elements and cast "season" from their vocabulary, they could speak more authoritatively on subjects

pertaining to the pastime, and, incidentally, add greatly to their pleasures.

In talking of fishing, football, or cricket, the expression is sensible, it has a meaning, but to apply it to a mode of travel as universal as motor cycling is a reflection upon the all-weather qualities of the modern motor cycle.

Is a T.T. Race Possible?

AN invitation has recently been sent from Douglas, I.O.M., to the Royal Automobile Club to hold a car race in the island during the present year. The R.A.C. has given its approval and the decision now rests with the S.M.M.T. If a car race is held, is it too much to hope that a motor bicycle race might follow it? We have evidence that the T.T. course could be put into-excellent order by next summer, and the local authorities are prepared to put the work in hand at once.

The Islanders look forward to the races as a means of increasing their prosperity and bringing additional visitors to their shores. Sporting motor cyclists would doubtless vote unanimously for the resumption of the races next summer, but it is improbable that the trade will be able to devote their energies to racing and at the same time satisfy the numerous customers who wait impatiently for their standard models.

A race for private owners and despatch riders would, we have no doubt, receive a large amount of support, and, if well organised, would turn out to be a thoroughly sporting event productive of much good tuning and good riding, but it would hardly take the place of the classic event of past years; moreover, it is possible that without the assistance of the trade there would be great difficulty in bringing the event to a satisfactory conclusion.

Though we and our readers would like to see a race in the Isle of Man during 1919, we recognise that, in view of the very exceptional circumstances which prevail at the present time, the final decision must rest with the trade.

IDEAS: Useful and Ingenious.

By Ray R. Jones



AUTOMATIC LAMP LIGHTERS.

THE attachment of auto-lighter mechanism makes it possible to light acetylene lamps by a flick of the finger, like switching on electric lamps, on any night, windy or otherwise.

First obtain two sets of mechanism, consisting of wheel, holder, flint, spring, and adjusting screw, as used on ordinary pocket lighters.

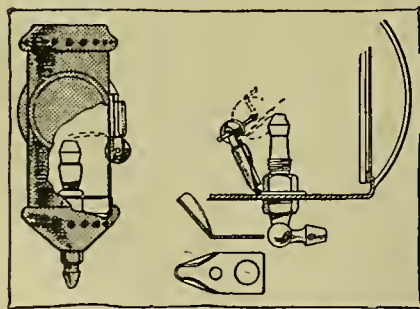
To fit one to the rear lamp a piece of strip tin or brass is cut, filed, drilled, and bent to shape, and the lighter soldered into position as shown. A small slot is then cut in the side of the lamp to fit the wheel by drilling a row of holes and opening out with a file, so that the spark occurs about a quarter of an inch above the burner.

The lighter is then put in position on the side of the lamp, and the ends of the strip are bent to suit the contour of the lamp and riveted on.

In the case of the front lamp the lighter is put inside the lamp and operated from outside.

A piece of tin is shaped as shown, a hole being made to suit the screwed portion of the burner tube, and a smaller one in order that the flint, spring, and screw may be inserted after the body of the lighter has been soldered into position.

The lighter wheel is fitted with a spindle made of a cycle spoke, the end of which is filed slightly taper, and driven into the hole in the wheel.



A simply designed automatic lighter.

A hole is next drilled in the lamp case, so that the end of the spindle may project through. The projecting end of the spindle is then bent to form a small crank. Turning this crank in the correct direction will result in a stream of sparks being shot over the burner, which will not fail to ignite the gas in even the strongest wind. It is well to unfasten the door catch, in order that an explosion, if it occurs, shall not blow out the front glass.

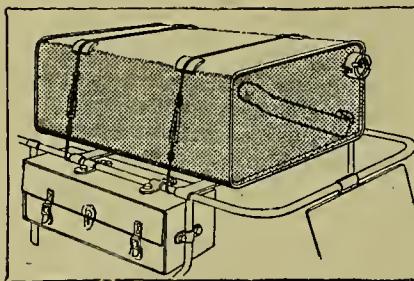
The fitting placed in this position does not in any way obstruct the light.—H.D.H.

A12

AN ALTERNATIVE TO CARRIER STRAPS.

STRAPS are poor things at their best, frequently stretching and breaking at the precise moment when most needed, and, further, they are exceedingly difficult to manipulate in cold weather.

A really good substitute can be made from R.A.F. wire, or any good cable of that kind, and a pair of turnbuckles, such as are used for rigging an aeroplane;



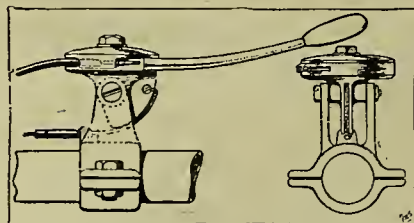
Turnbuckles and R.A.F. wire as carrier straps.

these articles should be easily obtained just now. The approximate length being decided, the necessary splicing and fitting is an easy matter. Leather pads to protect the corner of the object carried will be needed, and may be neatly looped on the wire so as to slide to any position.

A board on the carrier, covered in felt, if a good suit case is being carried, is necessary to avoid chafing on the carrier bars. A few turns of the buckles and the wire can be drawn to the necessary tautness.—F.A.S.

SINGLE CONTROL LEVER.

ALTHOUGH of the single control type, this lever is used with dual cables and the ordinary two-slide carburetter; in fact, it is fitted in exactly



A new method of single lever control. The movement of the lever might be termed universal, and is similar in action to the "joy stick" of an aeroplane.

the same manner as the usual double control.

As will be seen, the horizontal motion of the lever determines the opening of the throttle, and the vertical motion regulates the position of the extra air slide.

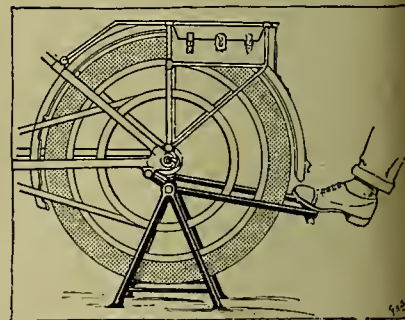
It is obvious that innumerable mixtures and volumes can be obtained by varying the position of the control lever.

One might at first be inclined to believe that this compound motion is too complex for a standard handle-bar attachment, but it requires little practice to determine the best path of the control lever; and after using once or twice, the varying mixture that is required from, say, starting up to full load, can be operated by the thumb in one movement upward and to the right.—H.

AN EASILY OPERATED REAR STAND.

A PROPOSED solution of the problem of raising motor cycles, particularly the heavier models, upon their stands, without excessive effort on the part of the operator is here given.

"The method adopted is to interpose a lever between the cycle and its stand. The stand for preference should be of the double A variety, the upper portion acting as the fulcrum.



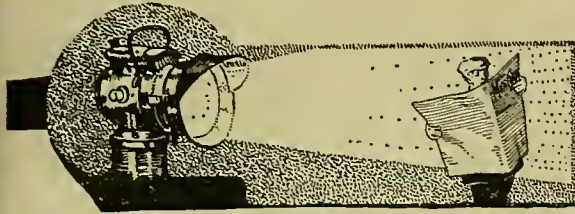
A rear stand requiring little effort of operation.

"The stand is dropped into position in the usual manner, the lever remaining in a horizontal position.

"By depressing the lever the machine is raised with a minimum of effort, and a spring clip attached to the lower portion of the stand retains the machine in position as long as desired.

"When not in use the whole device will collapse, and may be secured to the mudguard in the same manner as the ordinary stand, and it occupies but little more room.

"I find the arrangement is a great success on my Indian sidecar, and saves many an exhausting struggle.—B.B."



Occasional Comments

"By Ixion"

Strikes and Sidecars.

THANKS to the collapse of the London transport system I have been largely resident in a variety of sidecars for the past week, and they have suggested a whole series of points for study and experiment. One of the combinations was a 7 h.p. Indian, the sidecar being almost as large as a Blimp. This proved extraordinarily comfortable, but grossly unsociable: I sat on a cushion on the floor, and the Indian has rather a high saddle, so I had to give my muzzle 90° right plus 60° elevation whenever I wished to address the driver. I noticed with interest that the owner used his pilot jet exclusively in London driving, starting from rest on it, and travelling up to about 22 m.p.h. on top gear without opening the throttle. This secured rather an absurd adjustment, and, as acceleration implied a gear change, the pick-up was bad. I should like to conduct exhaustive tests on slow-running carburation for motor cycle engines; the majority rely on weak suction at a large jet, and better results should be obtained by fierce suction at a small jet. Another of my mounts was an A.J.S. s.c., which was normally driven in traffic on its lower gears, and gave terrific acceleration on an excellently tuned Amac. Its main defect was the absence of a spring frame: when crawling out in a traffic block, one could feel the back wheel dropping into Oxford Street pot-holes and clambering out of them exactly like a tank negotiating an old trench.

Two Methods of Traffic Driving.

THESE two machines showed up opposed methods of threading the traffic. The Indian driver adopted the principle of constant engine speed and used his gears for varying road speed. In favour of his methods, it may be urged that he created the minimum of noise, but gave himself the maximum amount of trouble, including much one-handed steering. The A.J.S. driver never used top gear unless he had a clear opening for a long sprint, but drove on the throttle with a lower gear engaged. The average driver combines both methods.

Air-cooled Engines—in Winter and in Traffic.

BOTH riders were obviously obsessed by their engines in two main respects. They got the wind up if they were blocked in traffic for a minute or two, and it is unquestionable that ticking-over in traffic does not suit pre-war air-cooled engines. At the same time you do not care to switch off, as the block melts quite suddenly, and a slight delay is involved even if the engine responds to the kick-starter immediately—which it cannot on present-day juice. Secondly, both of them were justifiably anxious about letting their engines cool when I made a call, lasting more than a minute or two, because restarting was so uncertain. The kick-starter seldom acts with a really cold engine on No. 3 spirit; prolonged pushing

and dope of aviation spirit or methyl-ether are the chief alternatives. It is quite clear that if fuel does not improve in quality by next autumn, artificial heat *must* be provided for engine starting; and the manufacturer who bears this point in mind will not regret it. There is no particular difficulty about water-jacketing the carburetter or inlet pipe, and a small spirit lamp for boiling the water could be carried. This sounds an extreme measure, I admit, but desperate occasions demand desperate remedies. Strong youngsters are having cruel struggles to start well-tuned machines of moderate weight. If nothing is done, the winter of 1919-1920 will see motor cycling under a cloud; and, if an electric carburetter heater is the most convenient panacea, our machines are not as yet furnished with the requisite current. Even if dynamo lighting is standardised during the ensuing year, it is not yet certain that the size of battery portable on a solo mount will stand the extra drain of heating the carburetter for repeated starts per diem. I think the eyes of some of our designers would be opened if they could spend a day in London just now with some of our girl D.R.'s and elderly male private owners. Engine-starting clouds their entire day in much the same way as an impending visit to a dentist's: and bad fuel is the root cause.

The Motor Thief.

THE second bugbear of Metropolitan motoring is the prevalence of theft. The burglars are as ingenious as they are daring. No car or cycle is safe if it is of a sufficiently common type to evade recognition during its hasty trip to the secluded workshop where it is camouflaged prior to sale. It is useless to change over the high-tension wires or put a disc of paper between the contact breaker points. Either the thieves are quite clever enough to diagnose such little tricks, or more probably a confederate keeps watch over the likely pull-ups, and cynically watches the owners while they take their innocent precautions. The only real safeguard is to own some weird-looking projectile or to dazzle-paint it in purple and yellow forked lightning, when the light-fingered brigade will be nervous of being tracked to their lairs. Here, again, the designer and accessory dealer have an obvious opening. As soon as bicycles lost their rarity and individuality, cycle thieving developed into a new "crook" profession, and anti-thief devices of an effective character came on the market. Similar devices are easily applicable to motor cycles, and the demand for them will be constant.

Sturdy Two-strokes.

JUDGING from one or two quiet digs in the Correspondence columns, I seem to have created an impression that I have no use for baby two-strokes. If anybody wants me to say that I regard them as having reached the standard of the 3½ h.p. four-stroke, I am emphatically a non-starter. This does not imply

Occasional Comments.—

that some of them are not really good: nor exclude the possibility that some of them are really bad. I can only generalise, and *pace* my critics, I will offer the following propositions for debate:

1. The baby two-stroke is simple in design; and consequently may attract the maker of cheap machines. Two-strokes are therefore of very mixed breed.

2. A well-tuned two-stroke is an incredible glutton for work. As tuning involves very accurate setting of the carburation and ignition, and is performed at best with a very narrow safety margin against overheating, it is not every buyer who gets delivery of a well-tuned mount. Neither is every buyer capable of tuning a two-stroke. An ill-tuned two-stroke may balk after three miles at 25 m.p.h. on the flat

Experiences as an Owner.

I HAVE owned perhaps a dozen baby two-strokes, some of them good and some of them horrid.

The main problem with all alike was to find a plug which they could not render incandescent up a long hill: aero plugs seem to suit them, and, as these plugs are now released for public sale, I think the babies will grow more popular. In the second place, they need running in: "baked" top piston rings occur readily with many of such engines, implying that overheating is never far distant; if any part is tightish, trouble occurs till a sweet-running fit is obtained. Thirdly, you have to learn on the road how to wangle the lubrication, which is never automatic and always affects carburation. Fourthly, the lilliputian type of carburetter is peculiarly liable to flooding, whilst an over-rich or a lean mixture accentuates the risk of overheating. Consequently, if a duffer buys an inferior make of two-stroke, he is usually in for trouble in the flesh; but if he is keen and teachable, he survives it, and when

"tune" is obtained, his little mount develops into a reliable glutton for heavy duty. On the other hand, if he is dull-witted and saddled with an ill-tuned or ill-made or ill-designed machine, he gets thoroughly disgruntled inside 1,000 miles. Here is my gospel for would-be two-strokers:

1. Get a cool plug.
2. Run the engine in patiently.
3. Oil it very accurately.
4. Play with the carburetter till it is right.

This same gospel is freely expounded in an excellent pamphlet of two-stroke tips supplied gratis to applicants by Messrs. Brown and Barlow.

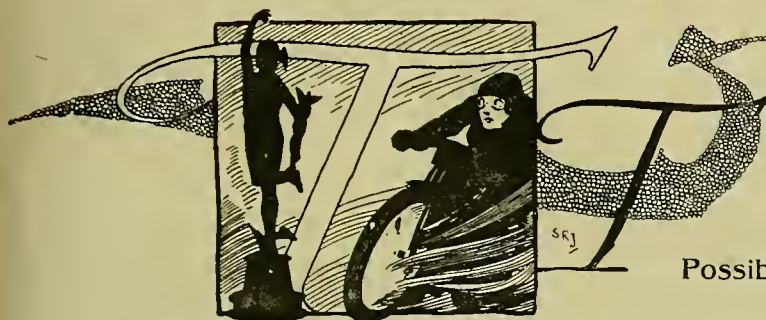
The Post-war Two-stroke.

I AM fully prepared to recant all the above caveats within twelve months—they are only written with ephemeral conviction. Five years of concentrated progress in air-cooling lies behind us, and we have yet to welcome the post-war baby two-strokes. Unless they are designed by engineering ostriches, whose heads have been buried in the sand since 1914, they will be far less prone to overheat than their prototypes. For example, a certain maker of air-cooled engines used to warn his clients never to run his engines free for more than sixty seconds; three years later he successfully ran one of his own engines free and fanless for four hours. Embody these modern principles in a baby two-stroke, and the four maxims laid down above are deprived of all urgency. Any old plug will serve a cool engine. Stiffness when new does not matter if you have a large safety margin in temperature. If an engine is air-cooled, you need not use oil-cooling as

an auxiliary, and you will not risk upsetting the mixture by converting the cylinder into an oil-bath for the piston. If the temperature is reasonably low, a fat or lean mixture will not produce seizure. So I am full of hope.



The idea of restricting motor cycling to a "season" is now dying a natural death in the United States, and, as in England, motor cycling is indulged in all the year round. The photographs—taken in the U.S.A. a few weeks ago—show Indian outfits in a district which might well pass for a Yorkshire scene, with its typical low stone walls. The expedition was clearly a sporting one.



Reporting the T.T. from the Air.

Possible Use of Aircraft in Journalism.

AT the moment it is doubtful whether the T.T. will be held in 1919, and if so what venue will be available. In any case, the next race, like its predecessors, will be run "over the water." Our readers may not have realised that to publish a fully illustrated report of the race at all promptly implies "some" rush. The afternoon boat leaves the Isle of Man just about the time at which the race finishes. The cable is pretty well blocked with press telegrams, and it is impossible for any one journal to wire thousands of words immediately. Consequently several of our staff, laden with heavy boxes of negatives and fat notebooks full of hasty jottings, board the boat at the last moment. The afternoon boat is not always an ocean greyhound: the s.s. *Ben Machree* was the fastest of the I.O.M. Steam Packet Co.'s fleet, and she took over three hours to reach Liverpool. If some of our party who deal with the actual finish of the race and obtain full times from the judges are delayed till the midnight boat, the voyage will probably take them six or seven hours. When the pressmen at last land in Liverpool, the trains are invariably awkward, and in consequence fast cars meet them at the Prince's landing stage, and convey the negatives and copy to our printing offices.

For the next T.T. a service of powerful aeroplanes may be employed. Busy men and habitual victims

of *mal de mer* will cross by aeroplane. Competing firms will transport urgent spares — possibly complete machines — by air. The crossing would only occupy from forty-five to sixty minutes, according as a fast D.H.9 or a weight-carrying Handley Page was employed. It is more than probable that *The Motor Cycle* staff may make the return journey from Douglas

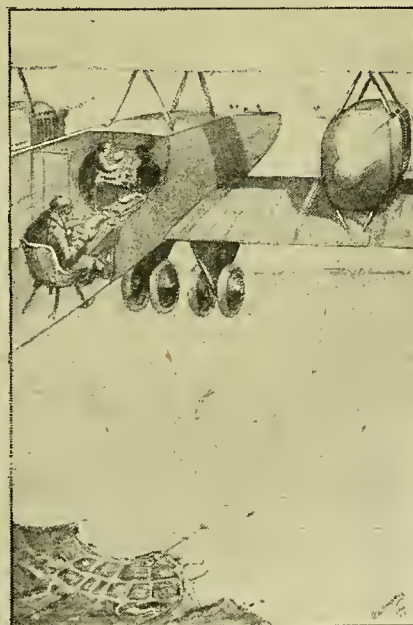
to Coventry by air in one stage, bringing their manuscript and photographs with them. Very little motion is experienced in the fuselage of a giant four-engined machine, and within a year or two newspaper associations will probably retain giant machines for urgent press reports of distant events. There is no reason why such a machine should not embody a dark room in which plates could be developed and prints made. Literary representatives could carry portable aluminium typewriters with them, and polish up their reports far more comfortably than is possible in a train.

Advertising or administrative stunts of an aerial character are also likely to be associated with future T.T. races. For example, a big tyre firm might elect to charter a small airship from which a representative could watch the progress of the race, wirelessly reports to announcement boards erected at the points where the chief crowds collect. Thus if the leader in the fifth round stopped to mend a puncture on the mountain, ten seconds later all the controls would hear "No. 7 mending back tyre one mile above Goose Neck," and so on.

Indeed, it is extremely probable that in a few years every illustrated journal of a topical nature will employ one or more pilots on its staff, and maintain its own aeroplanes. Modern journalism relies on the camera, and takes a pride in producing photographic reports of big events within a few hours of their occurrence. Every known form of swift locomotion was utilised for these high-speed stunts before the war — racing cars, motor cycles, motor boats, and special trains. Aeroplanes will often render possible feats which were impossible with trains and



Reporting by wireless the various incidents of the race



Preparing copy and developing plates as the plane speeds on its way.

Reporting the T.T. from the Air.—

steamers and motors. At present aeroplanes would often let the pressman down. Night flying is in its infancy, and what the Navy describes as "poor visibility" is a sad nuisance in long-distance daylight flying. In five years improved instruments should render the aerial navigator master of almost all conceivable weather conditions. When that day comes,

the most important illustrated daily journals will unquestionably keep a small fleet of high-speed 'planes, steered by crack pilots, and containing lilliputian dark rooms. In the meantime summer events, concluding in daylight, such as the T.T., offer a fair field for aeroplane organisation; and I shall be surprised if our next T.T. report does not enlist the services of a pilot.

ROAD RIDER.



CLEARING UP. A scene in France during the Allies' advance into Germany. The motor cycle in the foreground is a B.S.A.

Government Sale of Motor Cycles.

A Reader's Disappointing Experience during his Search for a Bargain.

THE bargain hunting car buyers are evidently suffering as badly as the motor cycle merchants at the Government sales, judging by the prices obtained for the rusted and mud-caked remnants put up for auction. It cannot be denied that a great deal of disappointment has been caused among the many prospective purchasers of motor cycles by the excessive and oftentimes ridiculous prices; but this provides an obvious lesson. There is a clear indication of a large market for a cheap machine, and of the existence of a great number of ardent would-be motor cyclists of mechanical turn of mind with very shallow pockets. Twenty-five pounds is their outside limit on a cash-down basis, and if they could buy one of the Army discards at from fifteen to twenty pounds and put it in order for another ten they would be well content. But it is not to be. The published prices have deterred many bargain seekers from visiting the sales, and the following gives an idea of the impressions of two men who went with the mistaken idea of getting something cheap.

The Trusting Optimists.

"Whilst on leave, I happened to run across an old motor cyclist chum, who suggested we should make our way to the Brixton Garage, where Aldridges were holding an auction of Government stock, including forty Douglasses. The prospect of getting hold of a good machine cheaply, as I foolishly thought, naturally appealed to me, as for some time past I had been looking out for a machine against the time when I should get my discharge.

"We found we had sufficient 'ready' between us (strange) for a deposit should we buy anything, and off we went.

"We arrived there just as the auctioneer had started selling the cars. After a lot of trouble we succeeded in obtaining a catalogue, and made our way to the motor bicycles, where we found a good crowd.

"We went round, making a note of our prices on the catalogue. We had priced about a dozen, and on reaching the thirteenth I said to my chum, 'Shall I put the same down for that?' 'That's right,' he said, 'throw your money in the air; the darn thing has no gear box, nor a contact breaker in the magneto.' We found lots of them minus various parts, such as gear boxes, contact breakers, valves, etc., and on one we tried we found no piston in one cylinder and the timing wheels gone.

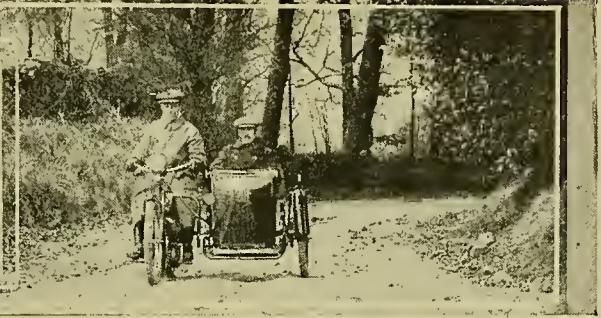
"At last we had seen the lot, and 'starred' one or two we rather fancied. By this time we were beginning to feel hungry, so off we went to get something to eat. On our return they were just about to start on the sale of the motor bicycles.

"A hush went through the crowd. 'Lot 108, Douglas motor cycle,' said the auctioneer, 'what can I say for this?' The bidding started, and the motor cycle was knocked down for £29. We had put our price at £20. Others were put up, and mostly fetched £10 more than we calculated.

"In one case, one we estimated at £10 fetched £26, and a voice from the back cried out, 'Put a chain on him; don't let him get away'—a remark which I silently seconded.

"After seeing about thirty go we decided that sales were no good to us, and we had better look out for a push bicycle. We departed, cold, and thoroughly fed up. On leaving, I shook hands with my chum, and remarked, 'Never suggest another Government sale!'—KYN."

MOTOR CYCLE HORNS & SIRENS



A Study of the Mechanical and Psychological Problems of Warning Devices.

NINETY per cent. of the antagonism of a section of the public towards motorists as a whole is said to be brought about by the injudicious use of violent and raucous road clearers, and this can be well understood.

The basis of any appliance of the nature of a road signal has two important aspects—psychological and mechanical. The former is brought about by the fact that every person surrounds himself, or herself, with a wall of partial insensibility. For the greater part of the time he is unconscious with regard to his surroundings, and not fully aware of the dangers which beset him in the street. The depth of this preoccupation, and consequently the speed of perception and reaction, varies with each individual, so that signals must be designed to have effect on the least responsive.

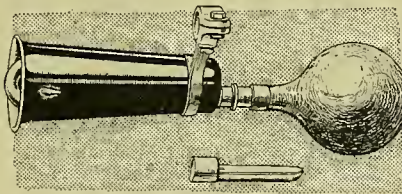
The Ideal Signal.

It must be borne in mind, however, that the mere creation of an unusual sound will not always serve as a warning. The ideal signal must be distinctive and impelling, and assert itself above all incidental street noises. In addition it must satisfy the requirements of an emergency alarm, and at the same time act as a distant cautionary warning. In the first case, then, it must necessarily be loud, abrupt, and perhaps disagreeable, but not so much so as to cause a temporary paralysis of movement. Careful riding should, of course, largely prevent the necessity for such emergency use. The second feature demands that the sound have carrying power, be fairly directional, and sufficiently concentrated to a narrow zone of influence. To turn to the mechanical side, it may be stated that, like other accessories, fifty per cent. of these instruments virtually undergo a breakdown test, receiving, as they do, little or no attention at the hands of the rider until they fail in some way, which accounts for the many ineffective devices one sees in common use. That is the fault of the bothersome human element, and should impel the makers to make the mechanism practically self-sustaining and foolproof.

The Reed Horn.

The reed type of horn was universally adopted on motor vehicles about 1903. In these instruments the sound emitted by the reed is generally strengthened by resonance. The term resonance signifies vibration. The ideal resonance is where both sounding and responsive elements possess the same natural period of vibra-

tion. The resonator, therefore, reinforces the tone, or the reverse. In the case of sirens, however, the resonator is of no fixed pitch, and only attached for the sake of appearance. In the mechanical horn the resonator should have a pronounced natural frequency. The air column within the resonator affects to some extent the natural frequency of the diaphragm, and obviously the effectiveness of the signal will be enormously



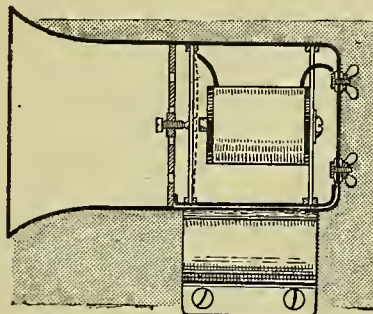
The simple reed horn. This particular design was used by many despatch riders.

increased when the natural frequency of the air column is selected so as to be the same as the normal full speed note of the bare diaphragm.

But, to return to the subject, very few reed horns are effective in the rumble of traffic, and will not carry any great distance in the open country. They are also affected by the temperature to some extent.

Sirens.

The siren was introduced about 1905, and found but little favour with motor cyclists. It consisted generally of a hollow rotor contained in a casing, and was operated by the contact of a friction wheel with the front tyre or by a geared-up handle.



Section of an electric horn.

Exhaust Whistles.

These were found on some machines as far back as 1908, and have enjoyed a kind of sporadic popularity ever since. They are fitted to the exhaust pipe between the valve and the silencer, and are operated either by a plunger or some kind of disc valve. They owe their popularity to two causes: a continuous blast, but one varying in intensity, is obtainable, and the note is generally musical. Another form is connected to the exhaust pipe after the silencer.

The Electric Horn.

The electric horn is a diaphragm horn in which the diaphragm is caused to vibrate by the influence of electro-magnets. In the simplest form, the diaphragm itself, being of soft iron, is attracted by the electro-magnets, and, carrying one of the contact points to the electric circuit, serves to make and break the current. When the circuit is closed by pressing the button, the magnetic pull draws the diaphragm towards the magnet. The movement of the diaphragm, as will be seen, breaks the circuit, and the elasticity carries it back to the contact, thus reinstating the circuit. The series of operations is, therefore, continuous, and produces a sustained note.

The Electric Buzzer.

A modification of the above is the electric buzzer, which operates by the action of a hammer, similarly to the clapper of the electric bell, a diaphragm taking the place of the gong.

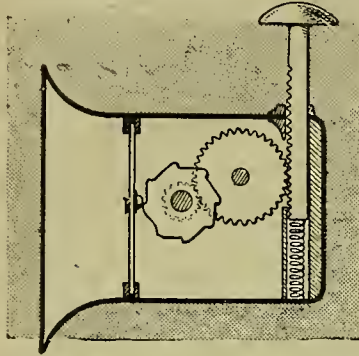
These types are generally operated by a six-volt battery, and, therefore, are not greatly favoured for motor cycle use.

The Mechanical Horn.

In the mechanical horn, the vibration of the diaphragm is accomplished by purely mechanical means, and the later types have proved exceedingly popular. In the centre of the diaphragm is a solid knob of metal, arranged to receive the impulses from a cam wheel or rotor. The total movement of the diaphragm is not more than five-thousandths of an inch, so that it can be operated very rapidly. The cam arrangement is rotated by a variety of means; in some cases a wheel is used, geared to a rack which carries a handle. When the speed of the rotor or number of cam pushes is properly harmonised to the vibration of the diaphragm, the ear perceives a recognisable musical note. Otherwise, when the dia-

Motor Cycle Horns and Sirens.—

phragm is continually overloaded to make a piercing sound, its life becomes considerably shortened. For this reason, the construction and design of a good mechanical horn is not so simple as it first appears. Some diaphragms crack and crystallise in less than a thousand signals. While the hand horn has the advantage of not being dependent upon any source of external energy, its position on the machine is limited. It should



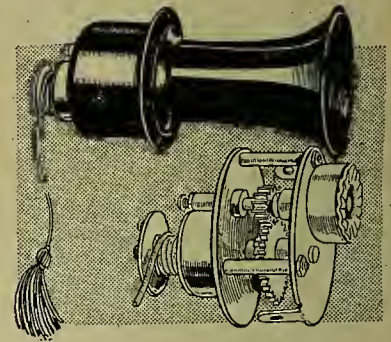
A very simply designed mechanical hand-operated horn.

not interfere with the operation of any of the controls. Some riders prefer to have it attached to the footboard and work it with the foot, but then it must be so arranged that it does not occupy the foot which is required for the brake pedal, and if attached to the bars it should be on the opposite side to the exhaust lifter. Probably the best place, however, is on the top tube, where it can be got at with either hand; but this, too, is a nuisance on greasy roads, necessitating, as it does, the removal of the hand from the bars.

It would appear, therefore, that in nearly every respect the hand-operated diaphragm horn, if properly designed, is the ideal form of signal. During the period of action in which the rotor is getting up to the speed and into the phase with the natural period of the diaphragm, there is produced a disturbance that is entirely unharmonic, which, because of its peculiarly rough and abrupt character, is both distinctive and alarming if heard close at hand, and is thus suited to the purposes of an emergency signal. Unfortunately, many types are made on pure guesswork, and their tones are horrible, without being very effective.

The abuse of signalling devices is not only an annoyance to the public, but breeds confusion and tends to cause

signals to be ignored, thus defeating the interests of safety. The value of a warning signal is seriously impaired by the fact that it is frequently used for the purpose of a door bell, when the machine is standing by the kerb; as an alarm clock for sleepy garage attendants; and as a plaything for street urchins. In a sense, the warning signal may be said to constitute the only bond of common interest between the motorist and the public in its peculiar function of guarding the public safety, therefore it is deserving of more attention than it has received heretofore. MASCOT.



The Kirby mechanical horn.

Opinions from the U.S.A.

An American Correspondent chats on British and American Machines.

At least one American motor cyclist does not believe that the U.S.A. motor cycle has always led the product of this country in the evolution of design. This gentleman, in writing to us from Newark, N.J., gives the British industry the credit for the introduction of, among other things, flat twin engines, footboards, gear boxes, kick starters, sidecars, and front wheel stands, and points out that all the U.S. industry can point to seems to be electrically-equipped mounts.

Our correspondent is very enthusiastic concerning the new A.B.C., and asks

why, "for the affections of Michael," the makers cannot put it on the market at an attractive price. "Singular thing," he writes, "the Harley-Davidson Co. are busy with a 'sport' model flat twin that eliminates the short drive chain, as does this new Firefly motor. Speed the day when we can abolish messy chains and have all shaft drive, silent and clean. I wonder if it is too much to expect on a motor cycle."

"Your Triumph single must be a 'cuckoo of a mount,'" our friend continues in pure American. "Three friends of mine—American D.R.'s, who have

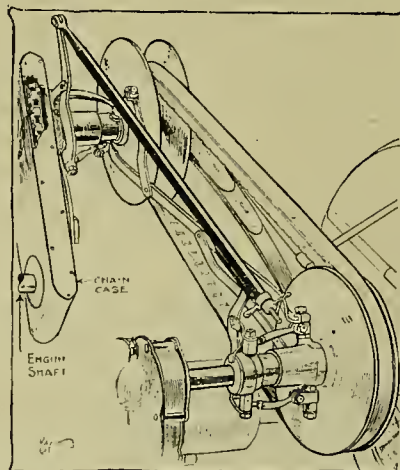
ridden two or more British mounts—simply rave when they describe the actions of a W.D. Triumph. One lad says it is the first real motor cycle he ever straddled."

We are informed that there is every evidence that there will be a big revival of sport in the U.S.A. this year, but the industry appears to be composed only of the Indian, Harley-Davidson, Excelsior, Henderson, Cleveland, Thor, and Reading Standard companies. The Smith motor wheel is still going strong, but the Merkel and Cyclemotor have dropped out, as has also the Emblem.

An Expanding Pulley Gear.

In a recent issue of *The Motor Cycle* we described an ingenious cycle car designed and built by a pioneer motorist, Mr. Leonard Jones. At the time of our visit to the inventor's workshop, details of the gear were not available, as the patents were not complete, but we are now at liberty to deal with it.

The drive is conveyed from the engine by enclosed chain to the countershaft, on which is mounted an expanding pulley. Over the rear axle, which is practically identical with that fitted to the old Ariel trieyele, is mounted a similar pulley, the drive being conveyed from one pulley to the other by belt. The chief novelty in the gear lies in the fact that ball-jointed toggle arms are employed for the purpose of shifting the movable flanges. The change-speed lever is connected to a sleeve on the countershaft. Inside this sleeve works a smaller sleeve, which is adjacent to the movable flange. The two sleeves are connected to the toggle arms



The gear as fitted to a cycle car

before mentioned, and the whole coupled up to a similar arrangement on the other pulley by an adjustable rod. The two sleeves which carry the flanges are also connected by a forked rod which prevents their rotation.

By means of the adjustable rod the toggles may be moved toward or away from one another, regulating the relative opening of the flanges, and so tightening or slackening the belt, as the case may be.

In the illustration, the position in one of the lower gears is shown. Naturally, to raise the gear the forward pulley is contracted, and the after one is at the same time automatically expanded.

In consequence of both pulleys being of large dimensions, the belt should wear a long time; the fact that it is adequately protected from wet also tends to prolong its life and prevent any possibility of slip. On the particular vehicle to which it is fitted the gear gives a very smooth drive.

A FLEET STREET COURIER.

THE MOTOR CYCLE AS AN AID TO DAILY JOURNALISM.

IF you are one of those Bohemian and poverty-stricken men who earn a precarious livelihood in Fleet Street (and I do not suppose you are), you will understand that there is no discipline more exacting than that which emanates from the Editorial chair. You can be hail fellow well met with any master of the blue pencil and scissors while there is nothing doing, but when you are bidden to get on to a story, you "get," and you do it quickly. And that's that.

On a pitch black night, and a rainy one at that, I was busily dopping a new war model Triumph with a particularly evil-smelling overcoat of grease, when the office boy ran down from the office to inform me that the Editor of a big London paper awaited my ear at the telephone. A minute later I was under orders to leave at once for the north-east corner of Norfolk, armed with whatever I needed, to get an illustrated story that had uninvitingly located itself in that particularly inaccessible place. All that I needed meant myself and an expert photographer to illustrate the story, seeing that a word picture would be inadequate without pictorial representation of the facts. It was past five o'clock, and I was advised that a train left Liverpool Street at 5.20. A glance at the A.B.C. showed me that that particular train was in no hurry to get to its destination, and that when it did, it landed me six miles from the end of my journey. Then I looked at the trusty Triumph, and fetched out the road map.

Stirrups for the Pillion Rider.

I am no believer in pillion riding, but there was only one machine and two men, so it had to be done. It was necessary to warn our respective domestic circles that we should be away, and, as we lived in different and difficult parts of London, it was three o'clock in the morning before we were ready to start—and still it rained. I had scraped together all the old overalls and impedimenta that I could find, and was done up like an inflated scarecrow. The pillion rider was likewise garbed, with the additional and *bizarre* fitment of brown paper leggings tied up with string. He had superimposed two cushions on the pillion, and had fastened a pair of stirrups to add to his comfort, and let me say at once that if you must ride on the carrier, fit stirrups—they are worth it. After about twelve miles of impossible cobbles and sticky tramlines, we touched the open road at Waltham Cross, and found matters worse.

There was mud in *excelsis*—inches of it, and in the first hundred yards or so we decided that it would

IN SEARCH OF NEWS
AND PICTURES
FOR A "DAILY."



The journalist and photographer about to start on their 100 miles ride from London to Norfolk.

not hurt us so much when we fell if we dropped to a slower speed. For about forty miles we carved a way through the mud without disaster, and then dawn began to break, so we opened out a bit, and made Cambridge in just enough light for mine host of "The Bull" to ponder over the advisability of admitting so disreputable a pair. Honeyed words from my passenger worked the oracle, however, and we entered. After a hearty breakfast we set off again, and, with drier and better roads, whizzed eastwards through Ely to Downham Market, which is the centre of the muddiest roads in the kingdom. Another hour took us through

King's Lynn to Sandringham, where royalty was in residence. Indeed, it was in attempting to make a courtly bow to Her Majesty of Norway, who with H.R.H. Princess Victoria was walking through the village, that the pillion rider nearly unshipped us. Sandringham is pretty, but it is a diamond in a quagmire. There are pinewoods which remind one of Hampshire, and there is a smell of ozone, which came as a pleasing contrast to the odour of loam and fertilisers which had offended our nostrils all through Norfolk.

Asleep on a Motor Cycle.

We accomplished our task in an hour or so, and immediately set back for the Metropolis, lunching on the way at Downham. I can always sleep well after a hearty lunch, and so, apparently, could my passenger, for we had gone but a matter of twenty miles when he sagged over on to my back and snored unmusically. The next thing I remember was that I had a dig in the ribs from the now wakeful passenger, with a demand as to why it should be necessary for me to negotiate a level crossing at thirty miles an hour—and I did not know we had passed one. I was more wakeful after that, but the pillion rider was not, and in his wakeful moments he exploited with fine rhetoric the alluring comfort of wayside hostelries and the dread crash which was the fitting sequel to overdoing it on muddy roads. But I had a mind to be through with the job as soon as possible, and after a while he discovered that he could not turn me from my purpose, and once again reverted to his snores. Darkness fell as we entered Ware, but we stuck to it, and, fifteen hours after leaving London, we were back again with about 250 miles to our credit and a coating of mud which would have made a decent sized allotment. My companion brightened considerably at the prospect of bodily comforts, and he has now placed an order for a machine similar to mine.

L.H.C.



Experiences with Seven Different Machines at Home and Abroad.

By GEORGE F. HALLIDAY.

The author of the following article is an engineer, and was a winner of one competition in connection with our recent "Which Type" referendum. His specification came nearest to the sidecar aggregate, and was based on experience with many types of machines in England and South Africa.

THE factors which led to my suggesting the specification for a sidecar machine, which was found to be the nearest to the aggregate in the "Which Type" referendum were based on conclusions drawn from riding experience on many different types of machines, solo and with sidecar, which were owned by me during the last six and a half years.

Backed up by an intimate technical knowledge of engineering practice in general, and that appertaining to high speed internal combustion engines in particular, my motor cycle experience has been conducted more or less as an experimental hobby.

As my journeys of the last four years have taken me to one of the colonies where conditions are entirely different from those existing in England, a broader view of general requirements has been acquired than would otherwise have been the case.

One of the first motor cycles I owned was a Rex. This outfit had competed in an A.C.U. six day trial. It was reluctant to start, but, when it did start, it went and took some stopping.

I had not had this machine long before I was on my way to South Africa. My destination was Johannesburg, a town abounding in motor traffic. Soon after arriving I acquired my second Scott, which, incidentally, was running on an alcohol-ether mixture when taken over. This machine ran very smoothly on the treacherous sandy roads outside the town and had a fine turn of speed, but, as is usual with this type of engine, fuel disappeared rapidly.

Belt and Chain Drive Machines.

Having occasion to return to England for two months I sought out my old Rex and made an exchange deal for a brand new Rex outfit which was ridden 1,000 miles in England before taking the combination to South Africa.

It must be said that, although this machine had a direct belt drive from engine to Roc hub gear, the whole sidecar outfit was of very robust construction, and when tuned up as a top gear machine it took a lot of beating. When new the engine was excellent, and having an adjustable pulley much experimenting was done with different gear ratios. Usually it was geared $3\frac{3}{4}$ to 1 on top for ordinary work using a $1\frac{1}{8}$ in. belt. This outfit used to cover the thirty-five miles

between Johannesburg and Pretoria regularly in seventy-two minutes or thereabouts.

The outfit was sold in favour of a $3\frac{1}{2}$ h.p. twin James, bought primarily for solo riding. With all the rigid scientific arguments in favour of the horizontal opposed twin—and these the writer fully appreciates—the engine of the twin James takes some beating in "practice." The only points which it is thought require attention are the gudgeon pins, which are rather small in diameter, and the single bush twin big end is not a very good principle in the writer's opinion, although it is admitted it is difficult of substitution in a small engine. The quick thread method of operating the clutch is not too good for colonial machines, as the sand soon makes it difficult to work. A stepped helix after Sunbeam practice is better, and though in hand-controlled clutches the long lever operating the push rod is simple, for compactness and good design the recommended system is better and more reliable.

The Effect of Altitude.

This machine was a great favourite and very much admired, because of the state in which it was kept; the plating and aluminium were maintained in brilliant condition (this is more easily achieved in the dry clean colonial climate than in England) and the machine in equal tune. In top gear the speed range of the James was between eight miles and fifty-five miles per hour; at the former speed the engine would fire perfectly regularly without falter, and it would always average over 100 miles to the gallon. In an over-estimation of the machine's capabilities a sidecar was attached; with this weighing 120 lb. and a passenger weighing eleven stone, the machine successfully negotiated over a quarter of a mile of average 1 in 8 on top gear. The combination was taken down to Cape Town during a two months' vacation, where the difference in power developed was noticed compared with the Johannesburg district, where the atmospheric pressure is only four-fifths that at sea level. Machines sent from England to such districts should have an engine with a higher compression ratio than normal, thereby counter-balancing the otherwise lowered compression pressure.

Fitting a sidecar to a machine designed for solo use

A Paying Proposition

for every Motorist and Motor Cyclist.

"The Amateur Mechanic," written by skilled craftsmen in simple, non-technical language, and practically illustrated by helpful illustrations, is now in constant use by over 35,000 citizens. With this "handyman's guide" at your elbow, you can

Teach Yourself How To Overhaul and Clean Your Motor

and to do simple repairs to motor cars and cycles. Also

To Do The Home Jobs That Cost Money.

The article on OVERHAULING A MOTOR CYCLE has many helpful illustrations, and the following titled sub-sections: Summary—The Wheels—The Frame—The Tanks and Fittings—The Carburetter—How the Engine Works—Overhauling the Engine—The Driving Gear—The Ignition Apparatus—The Brakes—The Reassembling, etc. This is money-saving knowledge for readers of this journal. The article on OVERHAULING A MOTOR CAR has also money-saving value for readers. This article has thirty-nine practical illustrations and drawings: also the following titled sub-sections: Summary and Explanation—Preliminary Examination Principally by Sight—Bearings—Carburetter, Couplings, etc.—Flywheel, Clutch Fork, etc.—Gauge Gear, Steering Gear, etc.—Frame Springs—The Ear Test—Testing the Engine—Compression Testing—Testing with the Engine Running—Worn Bearings—"Knocking"—"Popping"—"Hooting"—Silencer at Fault—Clutch—Change Gear—Undue Heating of Circulation Water—Lubrication—Testing on the Road—Ignition—Valve Timing—Defective Compression—The Shafts. A COMPLETE OVERHAUL: Testing for Alignment—Swivel Bearings—Wheel Bearings—Tyres—Removing Valve Chamber Covers—Removing Flywheel—Grinding in Valves—Removing the Engine—Testing Truth of Pistons—Removing Flywheel—Timing Gear—Magnet—Gudgeon and Pins—Case Hardening—Removing Piston Rings—Engine Repairs—Testing Bore of Cylinders—Truing Brasses—Belling the Crankshafts—Big End Bearings—Renewing Clutch Leather—Ball Bearings—Gear Renewings—Oiling Axle Springs—Aligning Gear Box and Engine—Reassembling—Engine Accessories—Brakes, etc.

"The Amateur Mechanic" also gives plain directions on—

How to paint and paper a room—To sole and heel and patch boots and shoes—To mount maps—To bind magazines and to re-bind old books—To make a pair of hand-sewn boots—To restore colour of old brown shoes—To make household furniture—To re-seat chairs—To upholster sofas, etc.—To install a speaking-tube—To make a wire bracket for placing over oil lamp or gas bracket so that food can be heated over it—To clean a Primus or other stove burner—To repair bicycles—To overhaul a motor car—To repair motor cycles—To work in metal—To colour metals—To make a garden frame—To repair water taps—To varnish a violin—To remedy damp walls—To repair the piano—To make a padded chair from an old cask—To make mailcart and perambulator hoods—To mend penknives—To stuff animals—To dress furs—To stuff and mount birds—To do wood inlaying—To cure a smoky chimney—To prepare working drawings and how to read working drawings—To make a chemical weather-glass—To renovate a grandfather's clock—To make invisible ink—To make garden furniture, arbours, arches, seats, summer-houses, tables, etc.—To use metal-drilling tools—To clean bookcovers—To renovate mirrors—To upholster furniture in leather cloth—To mend broken chiao—To do fretwork—To build a boat—To make a canoe, etc.—To lime-wash poultry houses—To do gold-plating and silver-plating—To clean a watch—To mend keyless watches and ordinary watches—To distemper ceilings and walls—To make picture frames and to frame pictures—All about curtain fittings—To make metal castings—To make tracing paper, waterproof paper, fire-proof paper, etc.—To clean paint off glass—To fit up a motor workshop—To clean boilers—To fix an anthracite stove—To re-gild and restore picture frames—How to use spanners—To make doors and windows draught-proof—To paint walls—To make a garden path—How to do nickel plating—To cure noises in hot water pipes—To make soap at home—India and glue varnishes—To clean and repair locks—All about acids for etching metals—Micrometers, how to make and use them—How to make plaster casts, etc., etc.

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This Work has helped others: it will help You.

It is a real "Enquire Within" on How to save Money in the Home.

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"The work is a splendid example of thoroughness, and a complete self-instructor. I consider it quite bears out what you claim for it."

Mr. G. LANCASTER, Waterfoot, Lancs., writes:

"I think they are well worth the money. They give me every satisfaction."

Mr. T. G. RIORAN, Upper Tooting, London, writes:

"With absolutely no knowledge of the trade to guide me, after reading the articles on Boot-making I was able to make a pair of boots, partly hand-sewn and partly riveted—and to make them well. Since then I have made a very fine pair of lady's shoes. I consider that nothing I can say about the work could be too much praise."

Mr. CARDWELL, Belfast, writes:

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Please send me, without charge or obligation to order, your Illustrated Free Booklet on the NEW work "THE AMATEUR MECHANIC," with particulars of your advantageous offer to send the work for a merely nominal First Payment.

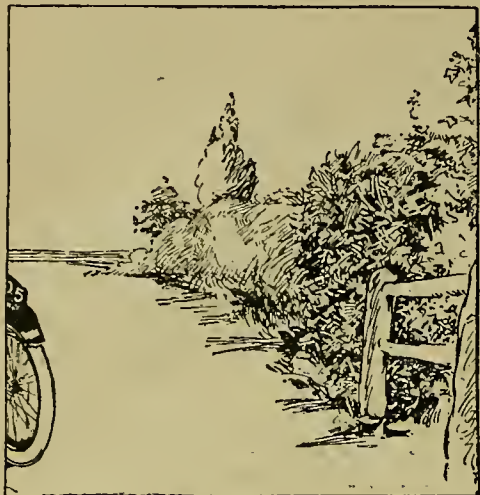
Name (Send this Form or a Postcard)

Address

M.C.N. 1919.

In answering this advertisement it is desirable to mention "The Motor Cycle."

A23



It is Coming!

What? The perfect motor bicycle — the machine that overcomes all the objections to motor cycling and includes all the comforts — the 5 h.p.

RALEIGH

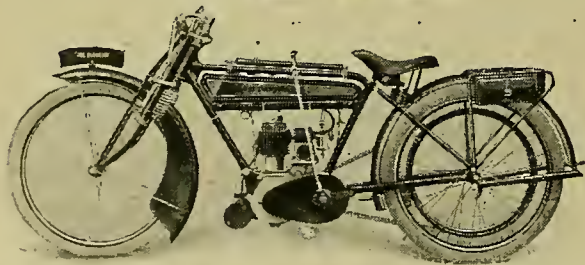
FLAT TWIN MOTOR CYCLE

It is no ordinary motor bicycle, but something very special, full of new ideas, things which will set all the motor cycling world talking. The new Raleigh is worth waiting for.

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We are now commencing the manufacture of the following models:

- 2½ h.p. two-stroke, single-speed machine (Villiers engine).
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Book your order now for early delivery

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SOLE DISTRIBUTING AGENTS:

London—Messrs. Robertsons, 157B, Great Portland St., London, W.1
Birmingham—The Stevens Cycle Co., Gooch Street, Birmingham.
Sheffield—Mr. E. W. Hatfield, 147, Norfolk Street, Sheffield.
Northumberland and Durham—Messrs. Travers, Ltd., Pilgrim Street, Newcastle-on-Tyne.

Well-known Motor Cycle Company is desirous of placing large contracts, for the manufacture of Engines and Gear Boxes, in the hands of a substantial firm capable of dealing with this work in bulk, and turning out a really sound Engineering job.

Firms interested should first address Box L9323, "The Motor Cycle."

The Critic in the Saddle.—

cost me a broken frame, due perhaps to the curved top tube. Needless to say, the sidecar became out of favour. The twin James, I consider, is, in the main, one of the finest solo machines made.

Sidecar or Solo Mounts.

Becoming tired of running off without being accompanied by my wife, I reluctantly parted with my favourite and took over a 5-6 h.p. A.J.S. combination with accumulator lighting. I had access to a charging plant, and therefore this system was worth while. Comments on this machine in general are bracketed with those on my later machine of the same make. Suffice it to say that, as a touring outfit with 700 x 80 mm. tyres in South Africa, this machine comes nearest to present-day requirements, though for prevailing road conditions a well-designed spring frame would be an asset.

Passing now to English climatic and road conditions again, my next acquisition was a step in another direction, viz., a 3½ h.p. single-cylinder Rover, semi-T.T. bars, and chain-cum-belt transmission.

The *ensemble* in this case is excellent, and detail design very well carried out, necessarily making the machine on the heavy side. The front forks were improved as regards comfort by the fitting of Terry's links, although I think the principle of making these springs take both tension and compression is bad. The aluminium chain case is a very commendable feature, as is also the silent-chain drive. The multiple plate cork inset clutch was found to be the most satisfactory of any type yet used, and was extremely sweet in action. It was found to be advantageous with this machine in hilly country, especially with a sidecar, to pack the cylinder base up $\frac{3}{16}$ in. With the approach of winter it was decided to part with the Rover in favour of a more powerful combination, and a standard 1915 A.J.S. outfit was obtained, which after a little tuning and a few replacements turned out to be a powerful outfit. I fitted this machine with 700 x 80 mm. tyres, which together with the very heavy Brampton type forks gave extra riding comfort on the rough stretches.

The Large Type Twins.

I consider that the A.J.S. 6 h.p. engine is the most successful attempt for its size yet made for sidecar purposes. The moderate compression, large valves, and light pistons go largely to confirm my views. It is probable that the power and efficiency could be further increased by fitting a larger exhaust system, especially in the piping. Many makers of the larger types of twin engines do not pay enough attention to the cleanness of design in exhaust pipe and tail pipe shapes, and as a consequence it is often difficult to clean these thoroughly. If the A.J.S. fitted heavier gauge chain cases, I believe it would become even more popular than it is at present. After all, it is not difficult to design a satisfactory oil bath chain case, clean and reasonably simple in construction.

A word or two will not be out of place on what is becoming a rather worn subject, viz., the kick starter. Personally my experience with this device in general has been a very happy one on later machines. Perhaps it might be said that all these machines are of good repute; nevertheless, my contention is that

far less adverse criticism would be offered if riders would keep the detail adjustment of their power plants in better order. It is futile to blame the kick starter if one does not take the trouble to keep contact breaker points and plug points in good order and proper adjustment; eliminate air leakage in inlet valve stems and induction pipes (no insulating tape should be used in a sound engineering job) to keep the carburetter in correct adjustment according to the atmospheric conditions prevailing at the time, and several other seemingly paltry, but equally important, things should be kept in mind.

Suggestions to Manufacturers.

The following suggestions are offered for the consideration of designers and manufacturers when drawing up detail specifications of machines such as will be wanted by the public in future.

In most cases the diameter of the crank pin might be increased with advantage, and in some engines the diameter of the gudgeon pin also. Shafts in which Woodruff or other type sunk keys are used might also be increased in diameter, so as to minimise the tendency for such keys to turn over under repeated impact loads.

Oil should certainly be led under pressure primarily to the big end bearing, unless, of course, roller bearings are adopted.

Pistons should undergo suitable normalising heat treatment before finish-machining or grinding is carried out to release initial local casting stresses, which are often the unsuspected cause of much loss of power in engines, especially if an over-zealous speedmonger commits the unpardonable mistake of overrunning his engine during the first 400-500 miles.

General Layout Proposals.

The opinion is offered that it would be better from many standpoints to reverse the usual order of general layout regarding transmission and position of timing gear, and place both drive from engine to the gear box, and from the latter to back wheel, together with magneto contact breaker, on the right-hand side of the machine, and the timing-gear on the left-hand side. Chain troubles occur much more frequently than do valve troubles, besides which it would be much easier to get at the valves and tappets in the suggested position than is the case at present with the chains when cases have to be removed from amid sidecar connections and framework.

It should be insisted that the magneto be placed well up and behind the engine on a firm baseplate, and not on a sort of improvised platform as has been seen on many well-known makes recently. The New Hudson arrangement is to be commended.

Ball bearings in wheel hubs should be of ample size, and adjustment should certainly be provided on the outer races and not on the spindle races.

Footboard supports in many cases are not nearly stiff enough, and usually develop a certain drooping tendency, maybe spoiling an end view, which, otherwise, would be quite pleasing in appearance.

Lastly, as most readers of *The Motor Cycle* have a certain fund of commonsense, no further words need be wasted in endeavouring to further the already very live agitation in regard to the universal adoption of the spring frame for all types of machines.



SPECIAL FEATURES

REPORTING THE T.T. BY AEROPLANE.

BRAKES

MOTOR CYCLE HORNS AND SIRENS.

TIME TO LIGHT LAMPS
GREENWICH TIME.

Feb. 20th	...	5.51 p.m.
" 22nd	...	5.55 "
" 24th	...	5.58 "
" 26th	...	6.2 "

Italian Regulations.

The ration of petrol to motor cyclists in Italy is now seven gallons a month. The importation of foreign machines is prohibited except by permit.

The New A.J.S.

The makers of the A.J.S. have gone back to detachable heads in the 1919 model. It may be remembered the military model did not embody this feature.

Carburettors.

Carburettor manufacturers are settling down to motor cycle models again. The carburettor of a lightweight motor cycle appears to be ridiculously small after handling aeroplane instruments almost as large as two-stroke engines.

Standard Benzole.

The National Benzole Association have fixed a standard for benzole to be used as motor spirit. It will be free from acids, alkalies, and sulphur, like water in appearance (pre-war benzole generally had a yellow tinge), and the specific gravity will be .870 to .885.

Appeal to London Motorists.

The Hospital Motor Squadron, attached to the R.A.C., appeals for transport for the wounded still in London hospitals to the various entertainments provided for them. The commandant is Mr. A. J. Wilson, of 154, Clerkenwell Road, London, E.C.1.

Second-hand Prices.

The following is a selection of average prices asked for second-hand machines, as advertised in *The Motor Cycle* for February 6th and 13th. It will be noticed that there is a slight advance on the previous averages published.

	Previous 1914	1916 to and 1918	
	1914.	1915.	1917.
A.J.S., 6 h.p., and sidecar	—	£82	£93
Allon, 2½ h.p., 2-stroke	—	£35	£42
B.S.A., 4½ h.p., and sidecar	—	—	£73
Douglas, 2½ h.p.	£35	£41	£57
Enfield, 3 h.p.	—	£41	£51
Enfield, 6 h.p., and sidecar	—	£67	£94
H.-Davidson, 7-9 h.p., sidecar	—	£74	£111
Indian, 7-9 h.p.	—	£43	—
Indian 7-9 h.p., and sidecar	—	£76	£110
Rover, 3½ h.p.	£22	£42	£80
Rudge, 3½ h.p.	—	£34	—
Sunbeam, 3½ h.p.	—	—	£83
Triumph, 4 h.p.	—	£43	—
Triumph, 3½ h.p.	£27	—	—
Zenith, 7-9 h.p., and sidecar	—	£70	—
Zenith, 4-5 h.p., and sidecar	—	£51	—

Freaks.

Although war time experience has resulted in several new cars which can be regarded as freaks, nothing of this nature has been produced by the motor cycle industry so far.

"Motor Cycles and How to Manage Them."

For some months past, owing to the absence of printing work's staff on service, the handbook "Motor Cycles and How to Manage Them"—has been out of print, but we are now pleased to announce that a new edition (the nineteenth) is now ready, and copies are obtainable from the publishers. Iliffe and Sons Ltd., 20, Tudor Street, London, E.C.4, price 2s. 6d. net, by post 2s. 10d.

Petrol Prices.

The maximum wholesale prices of petrol are set forth in a new Order issued by the Board of Trade last week, and are as follows:

	Per gal.
	s. d.
Aviation spirit (in 2-gal. cans)	3 0½
Special boiling points (in 2-gal. cans)	2 11½
No. 1 grade (in 2-gal. cans)	2 10½
No. 2 " " "	2 9½
No. 3 " " "	2 8½

In Scotland and Ireland, 1d. per gallon may be added to all the above prices. The retail prices are represented by the addition of 5d. per gallon in each case.

An American T.T. Race.

We learn that there is some talk in American motor cycling circles of establishing an event similar to the T.T. Race. The general feeling in America is for a closed event for stock machines, and the suggestion has been put forward that in 1920 the winners of the British and American events should compete against one another. In our opinion, however, it is extremely doubtful whether a T.T. race will be held this year.

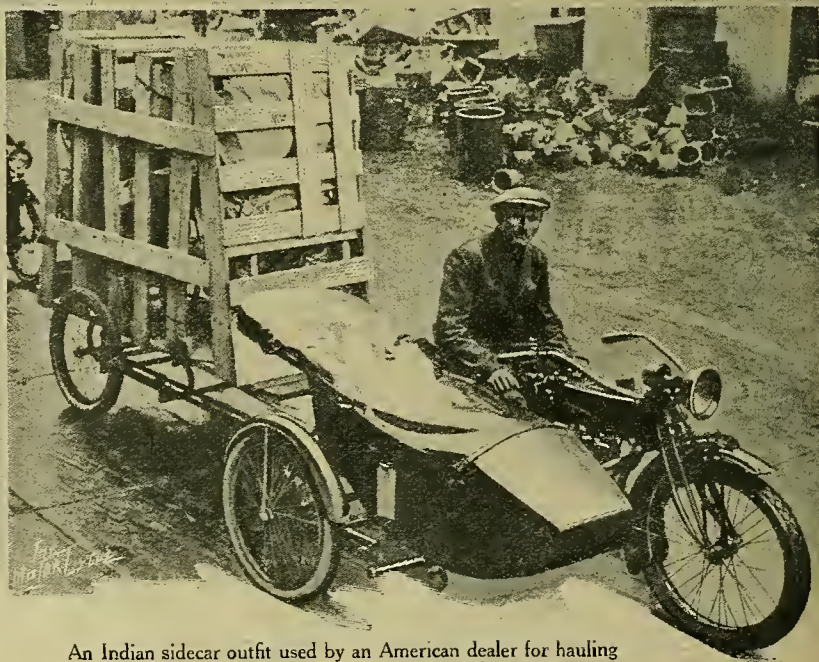
Institution of Automobile Engineers.

Two meetings have been arranged in Birmingham which will form part of the regular Session of the Institution of Automobile Engineers, though both the papers to be read will deal specifically with points connected with the design of motor cycles.

The first paper to be read at the Birmingham Chamber of Commerce to-day, February 20th, by Mr. D. S. Heather, B.Sc., will be entitled "A Survey of Current Motor Cycle Design," and Mr. Heather will write as a rider rather than a designer of motor cycles.

The second paper will be read on Thursday, March 20th, at the same place and time by Mr. Eric Caudwell.

The address of the secretary of the Institution of Automobile Engineers, from whom tickets of invitation to both these meetings may be obtained, is 28, Victoria Street, Westminster.



An Indian sidecar outfit used by an American dealer for hauling motor cycles from the Hendee factory to his stores.

Fuel.

Almost every week brings forth some new concession from the Government concerning fuel supplies. It is not unreasonable to expect that shortly all restrictions may be removed.

Canadian Show.

Montreal is to have a motor show in April, the profits from which will go to aid the Montreal Soldiers' Wives' League. A number of motor cycle exhibits will be included.

Petrol Vouchers.

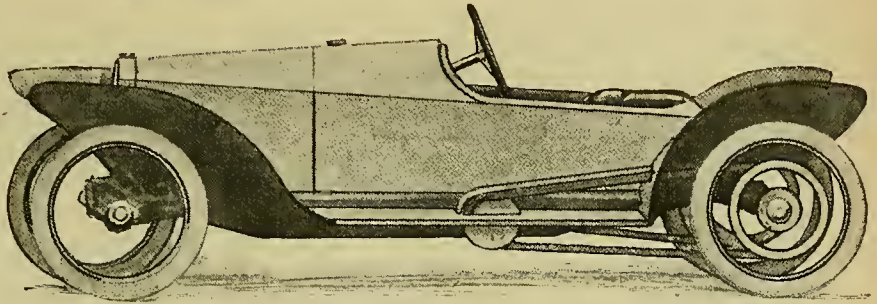
The Board of Trade announces that the vouchers of motor spirit licences issued by the Petrol Control Department may now be used for obtaining supplies during any month. The months printed upon the vouchers may be ignored.

How to Fly.

Those motor cyclists who read and enjoyed the articles which appeared in *The Motor Cycle* during 1918, entitled "Flying Facts and Theories," by Capt. W. G. Aston, R.A.F., A.F.Ae.S., A.M.I.A.E., will be rejoiced to learn that a book on the elementary principles of flying by the same author has recently been published.* We cannot indicate the objects of this book better than by a couple of quotations from the introduction. "The primary function of this book is not to teach you why aeroplanes fly, for that is the province of the abstruse physicist, but to try and explain how they fly. And again—"I give it as my honest and considered opinion that more people have been killed while flying because they have been incorrectly or inadequately informed of the principles of this science than through any fault of the structure of the aeroplane."

The subject is dealt with in quite a simple manner, commencing with the necessity for a streamline form and the movements of the air, following which we find much information respecting the angle of attack and the shape of the wings. The construction of aeroplanes is described and illustrated by an immense number of drawings.

* "Aeronautics Made Easy." Published by Messrs. Illife and Sons Ltd., 20, Tudor Street, London, E.C.4. Price 4s. 6d. nett, by post 4s. 10d.



A Spanish cycle car, the Edis, which has an 8-10 h.p. two-cylinder engine, 83.5 and 100 mm. bore and stroke respectively. The transmission is by shaft and lin. V belts, while the suspension is by quarter elliptic springs. The weight is approximately 5 cwt.

THE DISPOSAL OF ARMY MOTOR CYCLES.

It is probable that three methods will be employed in disposing of the Army motor cycles. In the first place, the Surplus Government Property Disposal Board may sell them in blocks; it may sell vehicles of an old pattern, or those which may be described as of a non-standard type, by auction; and, lastly, the Board may permit manufacturers to take a certain number of their own vehicles on conditions which would probably represent a compromise upon the original proposal to this effect put forward many months ago.

It seems, however, that at the present moment no definite decision has been reached, and the foregoing suggestions are, therefore, purely of a speculative nature.

We stated last week that Lt.-Col. C. V. Holbrook is Controller-in-Charge of the Mechanical Section of the Surplus Government Property Disposal Board. Among the advisory committee appointed to aid him are Mr. H. C. B. Underdown (Chairman of the A.B.M.A.M.), Mr. Julian Orde (Secretary of the R.A.C.), and Mr. F. Strickland (a well-known consulting engineer and writer).

Rear Lights.

There is no present prospect of the rear light regulation being rescinded in the case of cycles or motor cycles.

The Clyno Two-stroke.

Although it had been decided to abandon the manufacture of the Clyno two-speed two-stroke, in order to concentrate upon the 8 h.p. model, the Clyno Engineering Co. have decided to market this little machine this year. Several improvements will be embodied, including 24in. tyres instead of 2in., handle-bar control to magneto, hand-controlled clutch, increased number of clutch plates, belt guard, wider guards, Brampton forks, and drip feed lubrication instead of petrol. The price will be about £50, and deliveries will commence about Easter.

The Automobile Association and Petrol Licences.

To expedite the issue of petrol licences to motorists, the Petrol Control Department has specially authorised the Automobile Association to receive applications for fuel allowances, accompanied by crossed cheques, made payable to H.M. Paymaster-General, (not to the A.A. and M.U.), to cover the amount due for the duty of 6d. per gallon.

The Automobile Association hopes to be able to post petrol licences to applicants on the day following the arrival of applications and cheques at the head offices, A.A. and M.U., Fannum House, Whitcomb Street, London, W.C.2.

"A SURVEY AND CURRENT MOTOR CYCLE DESIGN."

THE inauguration of a motor cycle section of the Institution of Automobile Engineers is a matter the importance of which cannot be over-estimated at the present time. It means the bringing together of the motor cycle engineers and designers for their mutual benefit through an interchange of ideas and criticism.

Entitled as above, the paper to be read at Birmingham this evening by Mr. D. S. Heather, B.Sc., marks the commencement of this new era, and is decidedly appropriate for the occasion, being a criticism of general modern motor cycle design as a whole. Every detail of construction is dealt with in a thorough manner, and indicates clearly the direction in which progress in design should be directed.

Among the shortcomings of present-day engines. Mr. Heather instances

the unsatisfactory features of built-up crankshafts in conjunction with inside flywheels, and the restricting effects of this on other details, such as roller big ends, and the trouble in dismantling.

Beside the inherent drawbacks of the internal flywheels there is also to be considered their effects when the splash system of lubrication is adopted. Piston distortion and gudgeon pin fixing are thoroughly dealt with, and remedies for their failings suggested. The most unsatisfactory feature of engines appears to be that everything is cramped and restricted as to size, particularly such members as timing mechanism, tappets, and bearings generally. Sufficient clearances are not allowed in such places as magneto, gear cases, etc. Bearings are consequently shortlived, noise early develops, and oil is exuded on to the outside of the machine.

Mr. Heather's suggestions then, are for solid crankshaft, outside flywheel, and some system of forced lubrication, with the gudgeon working in bearings in the piston. A further section of the paper deals with the comparative merits of the various types of engines at present used on motor cycles; the small two-stroke, the horizontal twin, the single, and V twins of varying angles.

Other sections of the paper deal with clutches, gear boxes, transmissions, frames, rear springing, front forks, and miscellaneous details.

This paper, though offering many good suggestions, is, on the whole, intended to be somewhat of a destructive criticism, and has been written to a certain extent in conjunction with a constructive paper on practically the same subject, to be read at next month's meeting by Mr. E. Caudwell.

**Eastern Counties M.C.**

Particulars of membership of this club may be obtained from the hon. secretary, Mr. J. W. Percival, 5, Ruby Road, Walthamstow. Professional competition riders are not eligible as members.

Carlyle M.C.C.

The committee of the Carlyle M.C.C. held a meeting on the 12th inst., when a sub-committee was appointed to arrange a sporting and social programme, particulars of which will be published as soon as possible.

Old friends and intending new members are invited to communicate with the secretary, Mr. T. Laffeaty, 7, Vale Terrace, King's Road, Chelsea.

Darlington B. and M.C.

At the special general meeting of the Motor Section of this club, held on February 10th, it was decided to re-form the club.

The opening run was fixed for April 18th, at Bylands Abbey, where lunch will be provided.

Motorists wishing to join the club should communicate with the honorary secretary, Mr. T. W. Watson, Central Chambers, Darlington.

Ealing and District M.C.C.

In conjunction with the A.C.U. this club is endeavouring to arrange the standardisation of a motor cycle team for all clubs, so that, in inter-club events, fixed teams will compete.

Sporting trials both for experts and beginners will be held, and social events and smoking concerts, etc., arranged in conjunction. It is proposed to arrange for country headquarters about twenty-five miles from London, on a main road, so that members can obtain hotel accommodation and meet other members whilst on the road. The opening run will take place in March or earlier, date to be published later.

Woolwich, Plumstead, and District M.C.

The general meeting was held on February 10th, and was well attended. A resolution was passed challenging any motor club in the kingdom to provide a team to compete with them for the Woolwich club's inter-team challenge cup, the course to be 50 miles and a non-stop on Kentish roads. Full particulars of this event may be had on communicating with the honorary secretary, Mr. F. J. Ellis, 3, Nightingale Place, Woolwich, S.E.18.

The next general meeting takes place at 8 p.m. on February 24th. It has been decided to hold the opening run on March 2nd to "Three Horse Shoes," Knockholt.

Club Dates.**MEETINGS.**

- Feb. 21.—Sutton Coldfield and M.-W. A.C. A.G.M.
Feb. 24.—Woolwich, Plumstead and Dis. M.C. G.M.
Feb. 26.—York and Dis. M.C.C. G.M.
Feb. 27.—South Birmingham M.C.C. G.M.
Mar. 4.—Essex M.C. A.G.M.
Mar. 22.—A.C.U. (Birmingham). G.M.

EVENTS.

- Mar. 2.—Woolwich, Plumstead and Dis. M.C. Opening Run.
Mar. —Ealing and Dis. M.C.C. Opening Run.
April 5.—Birmingham M.C.C. Opening Run.
April 5.—M.C.C. Opening Run.
April 18.—Darlington B. and M.C. Opening Run.
April 21.—Birmingham M.C.C. Easter Tour.
April 21.—M.C.C. Easter Tour.
April 21.—Liverpool M.C. Opening Run.
April 21.—Dublin M.C.C. Dunlop Cup Trial.
June 9.—Dublin M.C.C. Whit-Monday Trial.
June (end of).—Dublin M.C.C. Twenty-four Hours' Reliability Trial.
Aug. 2 and 4.—Dublin M.C.C. Two Days' Reliability Trial.

Sutton Coldfield and Mid-Warwickshire A.C.

The Imperial Hotel, Temple Street, Birmingham, is to be the venue of the A.G.M. fixed for the 21st inst., at 7 p.m. The secretary is Mr. F. W. Finne-more, A.C.A., 122, Colmore Row, Birmingham.

Liverpool M.C.

At the crowded meeting held on the 5th instant, fifty-seven members were enrolled. The officials were elected, including the secretary, Mr. V. E. Horsman. A number of events were decided upon—among them the opening run to Llangollen at Easter.

We shall be pleased to hear again from secretaries and others regarding existing and proposed clubs, their programmes, and any other interesting particulars. We are also prepared to assist with advice or publicity those desirous of establishing clubs in their own localities.

Essex M.C.

As notified previously, the annual general meeting of the above club will be held on March 4th at the R.A.C., Pall Mall, S.W., at 7.45 p.m. All those interested are invited to attend. Nominations and notices for agenda must be in the hands of the honorary secretary not later than the 25th inst.

Auto Cycle Union.

It may be remembered that it was decided to run off the Arbuthnot Trophy as early as possible after the cessation of hostilities. This competition is open to Naval officers at present serving in H.M. Navy. The A.C.U. is now engaged upon drawing up the rules and regulations, and Maj. A. M. Low, R.A.F., and Mr. E. M. P. Boileau, have been appointed to proceed to Portsmouth to discuss details with the officials of the Naval M.C., whose co-operation is sought.

The competition will be in the nature of a reliability trial, and the winner will be found among survivors after a subsequent hill-climb or speed test.

The Competitions Committee of the A.C.U. recommend that the Six Days' Trial be held in August or early in September, in South or Mid-Wales, and a suitable centre is being sought.

Special attention will be paid towards the encouragement of lightweight motor cycles of the cheaper kind.

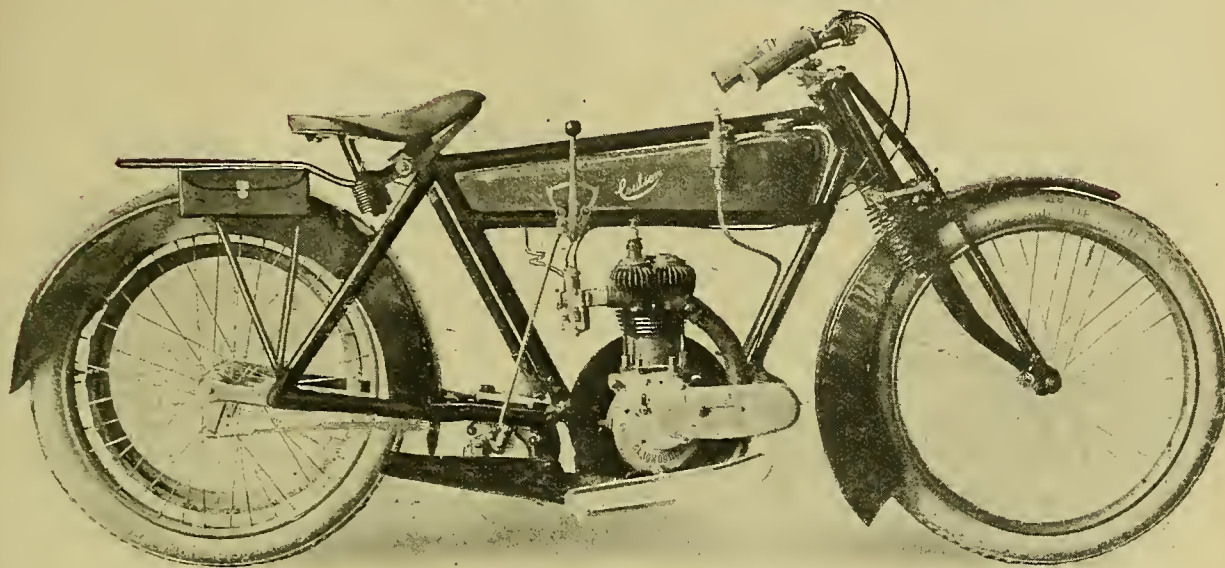
The difficulty in getting out a handbook has been found to be almost insurmountable, but it is hoped to publish a supplement to the list, which will give latest information.

A travelling representative has been appointed for inspection of hotels and repairers' garages. A large number of applications for appointment have been received from hotels and garages.

Nothing definite has been decided regarding the T.T. Reports have been received from the Island, one of which states that the course is in such a bad condition that the race could not possibly be held, while other reports state that the condition of the roads is not so bad as has been stated, and that they can be easily repaired. In the meantime, news from the various manufacturing firms, as to whether or not they would support the T.T. race this year, is awaited. Among certain firms it is felt that the running of this race would impose too heavy a task upon the trade, in view of its unsettled state owing to the changing over from war to peace conditions, and that, while the T.T. race will be heartily welcomed in 1920, it would be most inconvenient to the trade generally to run it during the present year.

THE 2 $\frac{3}{4}$ h.p. COULSON-B.

71 mm. x 88 mm. Single-cylinder Blackburne Engine, 348 c.c.

The 2 $\frac{3}{4}$ h.p. Coulson, a newcomer into the motor cycle industry. It is fitted with a spring frame and Blackburne engine.

WE recently published a few preliminary details concerning the 2 $\frac{3}{4}$ h.p. Coulson-B motor bicycle. The machine has now reached an advanced stage of construction, and in about three weeks' time the manufacturers, the Aeroparts Manufacturing Company, Albion Works, Albion Street, King's Cross, London, N.I., hope to be in a position to make deliveries.

The machine has a simple spring suspension. The frame is sturdily constructed of 1 $\frac{1}{2}$ in. tubing. On the under side of each chain stay there is a leaf spring, the rear end of which is attached by means of a shackle to a link carried at the end of the back forks.

Both front and rear wheel spindles are withdrawable, so that either wheel

may be instantly detached for the purpose of tyre repairing.

As previously mentioned, the mudguards are wide and generously valanced, the rear guard being 5 in. across. Between one and three-quarters and two gallons of petrol and a quart of lubricating oil can be carried in the tank, which is fitted with filler caps of large size at the forward end. The tank is attached to the secondary frame tube by means of special brackets, the method of attachment being invisible on casual inspection.

The engine is the 2 $\frac{3}{4}$ h.p. Blackburne, which is a small replica of the well-known 3 $\frac{1}{2}$ h.p. engine of this make, and, like the latter, is provided with an outside fly-wheel. The standard Blackburne features are retained, such as the detachable head,

solid crankshaft, and split big end bearing. The bore and stroke of this engine are 71 mm. and 88 mm. respectively (348 c.c.). The engine equipment includes the latest type Brown and Barlow pilot jet carburetter, M-L magneto, and a streamline silencer.

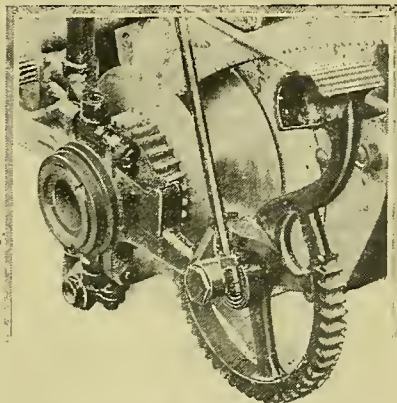
The stand is fitted just behind the bottom bracket on which the countershaft Albion two-speed gear box is suspended. The handle-bars are of the semi-T.T. pattern, and are provided with rubber grips and inverted levers for the front brake and exhaust lifter. The forks are Druid stronger type Mark II., and cast aluminium footboards with a rubber rest for the heels are provided. The total weight of the machine is estimated at between 150 and 160 lb.

A Grado Pulley with Kick-starter.

JUDGING from the number of single gear machines in existence and the demand for change speed gears, the variable gear device illustrated here will be welcomed by a large number of riders who are now fitting up second-hand machines. It is a Grado expanding pulley, giving a free engine and ratios from 4 to 1 to 8 to 1, and embodies a kick starting gear.

The principle of the Grado pulley is known to many of our readers. The outer flange continuously tends to close in on to the inner flange, thus gripping the belt in whichever position it may be. In fact, if the controlling mechanism is freed, the pulley will gradually close and raise the gear, unlike the majority of similar gears, which always incline to open out.

The Grado Co. has now embodied a kick-starter, which is quite simple in construction. A gear wheel is carried on



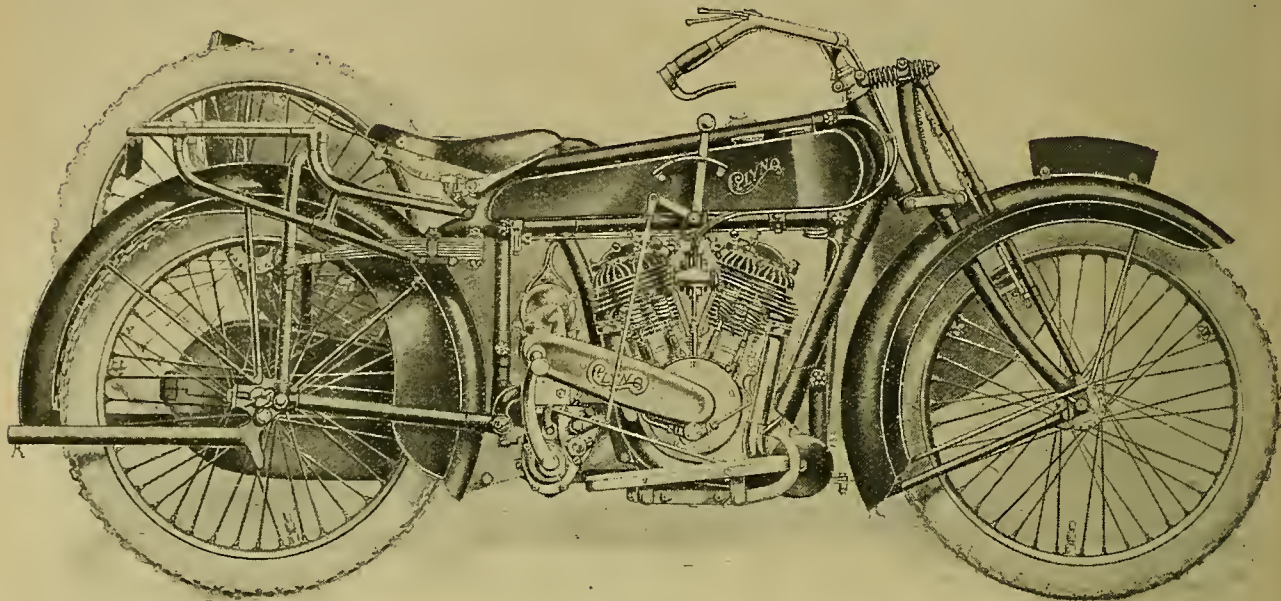
The ratchet gear wheel and kick-starter segment.

the pulley, and is connected to the engine-shaft through a free-wheel ratchet arrangement. Behind this is a segment embodying a pedal lever, which, upon being pressed down, engages the segment with the free-wheel pinion and turns the engine.

The segment is carried on a bracket supported by the operating mechanism of the pulley, and is stayed by a long diagonal rod in tension. The whole of the kick-start device moves laterally with the outer pulley flange, but provision is made to prevent any stress being imparted to the engine-shaft. This latest design also has an improved method of attachment to the crank case, which permits it being fitted to almost any engine without undue trouble. The price of this model is £9 9s., and the makers, Messrs. Grado, Ltd., Pershore Street, Birmingham, hope to commence deliveries during the next three weeks.

THE NEW 8 h.p. CLYNO.

A Modern Machine designed throughout from the Point of View of Overseas Riders.



The 8 h.p. peace model Clyno. 76 mm. bore, 102 mm. stroke; 925 c.c. capacity; detachable heads; 28in. x 3in. detachable wheels; mechanical lubrication; spring frame.

WE have long urged that British motor cycle manufacturers would benefit by more careful attention to the insistent demands from Overseas for a machine in every way suitable for the special requirements which were only fully covered in the big twin class by certain American machines.

What is required by a large number of Overseas-buyers is a large capacity engine, 28x3in. tyres, spring frame, and, coupled with such a specification, British quality in design, material, and workmanship.

The Clyno Engineering Co. in their "peace model" have, it will be seen, appreciated the needs of a vast proportion of the Overseas market, for the new Clyno has been designed

throughout, from the point of view of the Colonial, and the result is a machine which sets a new standard of design which will be appreciated just as much by riders at home. The popularity of American machines in this country and Overseas indicates that what is absolutely essential in the Colonies is also desirable in Great Britain; hence, while the motor cycle designed for this country may not be suitable for South Africa or Australasia, the true Overseas mount is equally good for home or abroad.

The general outlines of the new Clyno, at first sight, appear to follow those of well-known American machines. This, however, probably is due to the high ground clearance (over six inches), the spring frame, and unconventional looking carrier; because, upon examination, the general design is more British than American.

The Spring Frame.

The frame is of very substantial construction, the makers' experience with their machine gun sidecars being responsible for several special features, notably the exceptionally strong head, which has massive, but by no means ugly, webs, on each side and at the rear of the casting. Both top tubes slope towards the rear, terminating in a single member embodying the carriers for the rear springs, and a lug for a vertical tube, which takes the place of the more conventional "seat" tube. The foot of this tube is the pivoting point of the rear wheel frame, between which and the engine the gear box is carried. Forward of the latter unit is another "down" tube, the only bent tube in the principal frame structure. This supports the engine on one side and the gear box lugs are integral with the frame, the

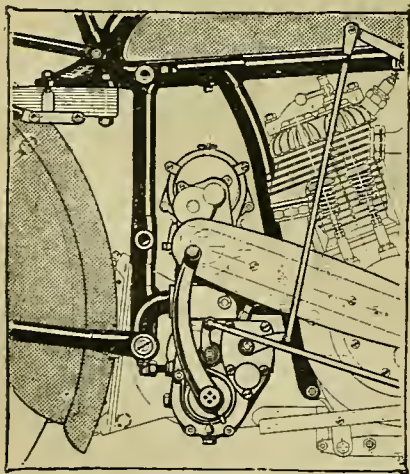
two rear members being on the vertical rear tube, while, to meet the stresses caused by the sidecar, the front down tube is 1½ in. in diameter, and strengthened internally by high tensile steel tie-bars.

Comparatively short springs with seven leaves are hinged at their rear ends on the sides of a loop member over the wheel, which in turn is pivoted at the ends of the chain stays. The bearings of the loop are of good size, while at the frame end the bearings carrying the stays are calculated to prevent any lateral play. All moving parts are equipped with grease cups. The carrier is on the spring portion of the machine, and is of tubular construction.

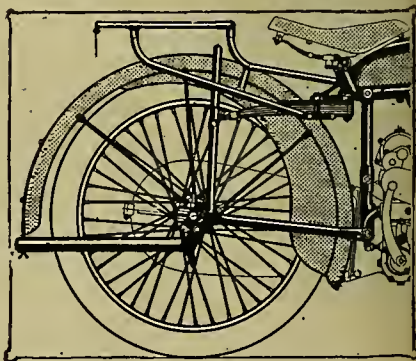
Mudguards and Wheels.

Deep valances are fitted to the 5in. rear mudguard, which is well stayed, as is the wide front guard.

Quickly detachable and interchangeable 28in. x 3in. wheels with voiturette rims are fitted, and these have solid steel hubs and large adjustable ball bearings.



Gear unit, showing the combined magneto-dynamo, which may be fitted to order.



The rear springing of the new Clyno.

The New 8 h.p. Clyno.—

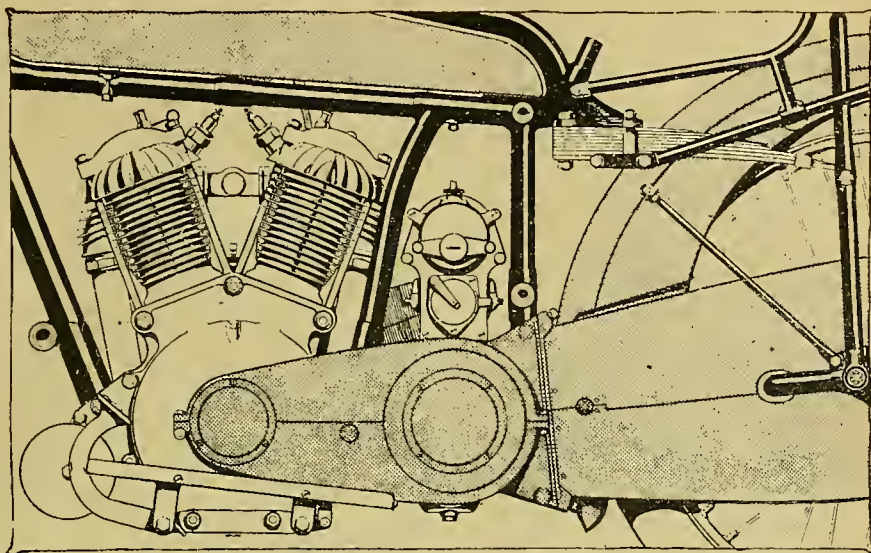
An 8in. internal expanding brake is fitted on the driving mechanism at the rear wheel, and is operated by a pedal on the left side of the machine. The shoes are faced with Ferodo, and therefore renewable. The front brake is of the conventional type, i.e., fibre pads in shoes working upon the rim of the wheel and operated by lever on the handle-bar. The latter is of good width, gives a comfortable riding position, and in shape may be described as a step between the conventional upturned bar and that which is known as "semi-T.T."

Front and back stands and Brampton type forks complete the main elements of the frame.

The Long-stroke Engine.

We may say that it is a long time since we were so favourably impressed by a motor cycle engine, both in the points of design and performance. The bore and stroke are 76 and 102 mm. respectively, which give a total capacity of 925.5 c.c. The cylinders are set at 42°, which we think is somewhat unique in British machines, the most general setting being 50°. The cylinder dimensions show that the engine is of the long stroke type; in fact, the stroke, in proportion to the bore, is longer than that of any British twin motor cycle engine hitherto produced, the ratio being nearly 4 to 3.

Important features are the detachable heads and the methods adopted to hold them in position. On two sides of each cylinder there is a swivelling bolt extending from the crank case to above the cylinder heads where they are linked by bridge members, which bear upon the centre of the cylinder heads. The part in contact is concave on the cylinder and



Strong metal chain cases are fitted which are readily detachable.

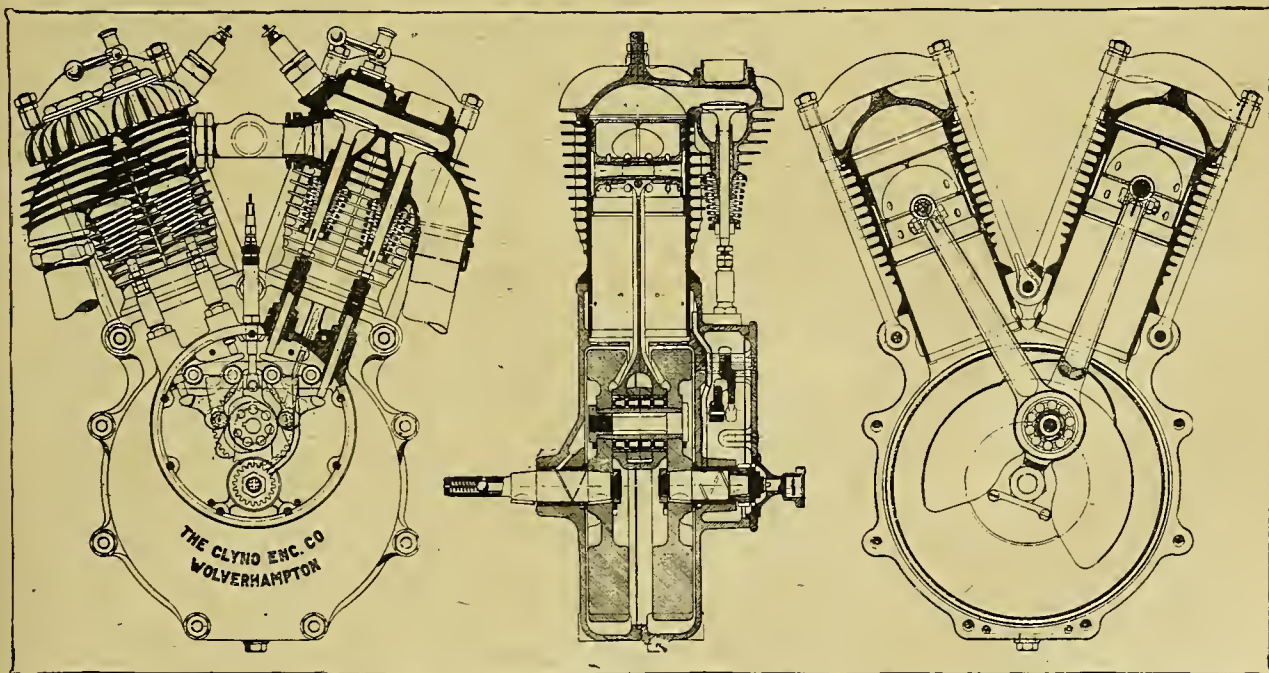
convex on the bridge piece, which makes the latter more or less self-centring.

To detach a cylinder head it is only necessary to remove one nut, slacken the other, and swing the bridge piece clear. The head removed, together with the valve chests and valves, the cylinder barrels may then be withdrawn without further use of tools.

The cylinder barrel is spigoted into the head, and a gastight joint made by the usual copper and asbestos ring. The top fin on the cylinder barrel is "dished" to receive the rim of the socket portion of the joint.

Thirteen fins encircle the cylinder barrel and are joined together at four points of the circumference by what may be described as vertical webs. The head portion has "upright fins" across it, while the valve chambers have fins arranged approximately radially.

The pistons have flat tops, and are of cast iron, with four webs. Three rings are fitted at the top, and below them for nearly half its total length the piston is recessed, and has a narrow skirt with a strengthening rib about its bottom edge. In the waist of the piston are a number of holes, introduced to



The 8 h.p. Clyno engine. (Left) The valve-operating mechanism. (Centre) Cross-section of the engine showing the bearings. Note the small lubricating pump on the timing side end of the main shaft, and the oil trough about the base of the cylinder. (Right) Section through the engine, showing the small ends of the connecting rods and the roller "big end."

The New 8 h.p. Clyno.—

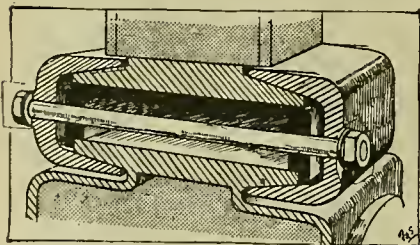
lighten it. Extra long bosses are provided for the gudgeon which works in them. The gudgeon pin is fixed in the small end by means of a cross bolt, the connecting rod having a saw cut from the lower part of the small end bore extending into the I section rod, to allow the small end to grip the gudgeon pin when the bolt is tightened up. Thus, it is evident that, instead of the connecting rod working upon a fixed gudgeon pin, the latter moves in the bosses in the piston. By these means there is approximately a hundred per cent. gain in bearing surface over the more conventional bushed small end.

The "Big Ends."

As will be seen from the drawings, one connecting rod is forked, which is another departure from previous Clyno practice, the 5-6 h.p. model having side-by-side connecting rods. The big ends are fitted with roller bearings, each having two rows of rollers in bronze cages. The plain connecting rod has two rows side-by-side, while the forked rod has a row on each side of the other pair. The cages are of one type, and the pair on one side faces the pair on the other, having a hardened and ground steel ring between them. The big ends are lined with renewable hardened and ground steel rings.

Crank Pin.

The method of fixing the crank pin is novel. Although it has been in use some time on war-time Clynos, the design is not generally known by the motor cycling public. The crank pin is hollow, and has tapered ends, which fit in tapered holes in the flywheels. Through the centre of the pin there is a shouldered bolt, with a large head on one side and a shouldered nut on the other. By tightening the latter, the crank pin is pressed firmly into the flywheels. Each



The gear box and magneto are fixed by wedging clamps, thus preventing any possibility of misalignment.

end of the bolt has a locking device, which will be seen in the third drawing of the engine.

Main Bearings.

Long plain phosphor bronze bearings support the main shafts, the adoption of which, no doubt, contributes to the silence of the engine, which we inspected after many thousands of miles of running.

A single cam wheel, which is supported in bearings at both ends of its shaft, operates the valves on both cylinders through three pairs of rockers. The exhaust rockers, having the greatest

amount of work to do (i.e., to open the exhaust valves against the pressure of the expanding gas in the cylinders), are fitted with rollers. Two pairs of rockers are used to operate the inlet tappets, the arrangement of which will be clear from the drawings.

An extremely neat exhaust valve-lifting mechanism is embodied within the timing gear case. This is in the form of a stirrup which, upon being raised by means of a Bowden wire, takes both exhaust rockers out of action. Means of adjustment are provided by two knurled collars.

The tappets, which are adjustable, are equipped with light springs to keep them in contact with the valve stems, while double springs are fitted to the valves, which are of ample diameter.

It will be seen from the drawings that the induction pipe is very short, and is fixed by screwed collars, which compress washers of asbestos, and so obviate all chance of air leaks at this important point.

Exceptionally large exhaust exits are provided, with 1½ in. exhaust pipes carrying the spent gases in easy curves to a long 4½ in. barrel silencer.

Lubrication.

At their lower ends the cylinders extend deeply into the crank case, the space between them and the crank case walls being utilised as an oil trough into which fresh oil is pumped by a small eccentric pump on the engine-shaft. This pump draws its supply of oil from a drip feed on the tank. In the walls of the cylinder barrels are a number of holes through which the oil overflows and so lubricates the pistons. In addition to these holes, there is a pipe in the trough through which oil flows directly to the timing side main bearing.

On the driving side the oil which drips down the inside of the crank case is collected in a trough just above the bearing, to which it is fed by a large oilway.

No special means are adopted to lubricate the crank pin and gudgeon pins, which secure their share of lubricant by splash in the usual way. In addition to the mechanical lubrication system, the machine has an auxiliary hand pump with a two-way tap, by which the driver may give either engine or gear box a charge if and when required.

Shock Absorbing Device.

In our previous reference to the new Clyno on the road we mentioned the extremely smooth running of the machine. There is no doubt that the shock absorber largely contributes to this. The device consists of a sprocket, free on the engine-shaft, and having four cams on its outer side. These bear upon four spring-loaded plungers carried in a member which is fixed to the engine-shaft. Thus, the impulse of the engine does not impart a shock upon the transmission. In addition to the spring pressure, there is the frictional contact between the sprocket and the member against which it is held by the plungers.

The Gear Unit.

We are not permitted to give full details of the new three-speed gear box. It is interesting to note, however, that,

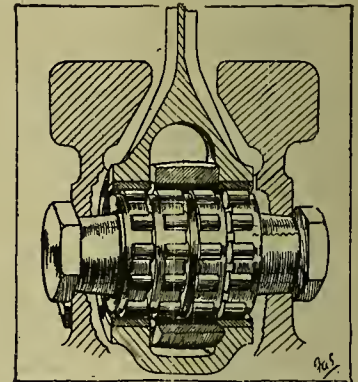
while the gears are the same size as the gear unit of the 5-6 h.p. model, the complete box is 6 lb. less in weight. The layshaft is of the built-up type, while the gear wheels are ½ in. and ¾ in. wide. All gears are in mesh, and engagement is obtained by dog clutches of the internal tooth type. The kick-starter is entirely enclosed.

The clutch is of the multiple plate type, with cork inserts, and fitted with roller bearings. It embodies a single adjusting spring, and is operated by the right foot. On the top of the gear box is carried the magneto or mag-dynamo, whichever may be fitted. This is driven by a chain enclosed in an aluminium case as hitherto.

At every point it has been remembered that it is necessary to guard against sand clogging the working parts, which are usually exposed. For example, the quick thread operating the clutch, although only outside the case for less than ¼ in., is protected by a sleeve.

Built up Chain Cases.

The ½ in. x ¾ in. chains are entirely enclosed in strong metal cases, reinforced and built up on castings, and are as solid as the aluminium type previously fitted. The method of construction has been



On the big end bearings each connecting rod takes two cages of rollers. Note the central dividing washer.

thoroughly tried out on the sidecar machine guns supplied to the Government. The mode of fixing is simple, and renders their removal an easy matter.

Accessibility at every point is a strong feature of the design. The footboards and pedals are built up as a complete unit, which may be removed by withdrawal of two bolts. The clutch is rendered accessible by detaching two screws on the domed cap and two nuts on the top of the case.

Space does not permit of a detailed description of the sidecar, which we leave for a later date. It suffices to say that it is a carefully thought out design, embodying a wheel sprung by quarter-elliptic leaf suspension.

The body is roomy, and is suspended on large C springs.

Altogether the new Clyno impresses us as a thoroughly sound proposition, and one which will remove much of the complaint against the British motor industry, that Empire trade is not regarded seriously.

Springing and Frame Design.

A Pressed Steel Construction having many Good Features.

MR. P. A. Fisker, of Copenhagen, has undoubtedly gone a long way towards achieving the embodiment of the ideas of super-refinement enthusiasts in his patented motor cycle design here illustrated.

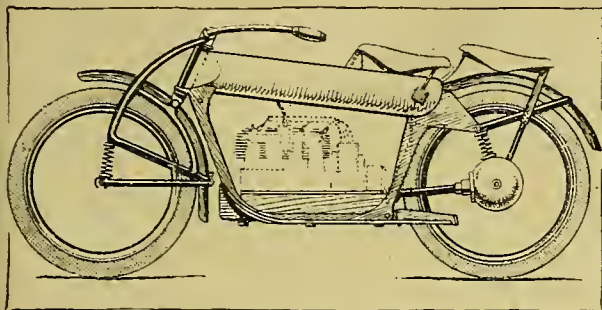
The principal features of the construction are the duplex pressed steel members carrying the engine and connecting the steering head and the rear wheel stays. The saddle is supported by the steel tank, which is attached to the steering head at one end, and the main frame

plates at the other. The springing is of a decidedly novel type, comprising long lever arms and helical springs. The extra saddle, which is fitted in place of the more usual carrier, is also sprung. A great deal of attention has been paid to mudguarding. The pressed members are stiffened laterally by wide footplates extending the whole length of the engine. The engine rests on another plate, which forms an undershield, so that it is practically enclosed in a mudproof cradle.

A four-cylinder engine is shown fitted with a simple type of totally-enclosed shaft and bevel drive.

No indication is given in the specification of any further provision of means for the prevention of lateral play in the springing of either wheel. Failing any additional support, to that shown at these points, we should expect the side movement to be considerable.

The frame construction, however, as a principle, has much to recommend it.



A unique Continental design.

THE MOTOR CYCLE ON ACTIVE SERVICE AND AFTER.

MOST of our pre-war readers will remember W. B. Little, whose sensational exploits on Skiddaw and Helvellyn with a motor cycle caused him to be known as the "Motor Mountaineer." He was well-known, too, as a consistently successful competition rider, winning, among other prizes, the award for the best amateur solo performance in the 1912 A.C.U. Six Days.

At the time the war broke out, Little was in France as a competitor in the

Little joined the Army almost immediately, and in April, 1915, he was in France, a captain in the Durham Light Infantry, and served some time on the Brigade staff, later being second-in-command of the 5th Border Regiment. In 1917 he was given command of the same battalion. In March, 1918, this battalion had so many casualties that it was amalgamated with another Border battalion, and Little was given command of a Manchester battalion until it was disbanded. August last saw our friend in command of the 6th Royal Dublin Fusiliers, with which regiment he is now in France—a lieutenant-colonel.

Lt.-Col. Little has been awarded the D.S.O. and bar, and the M.C. He has been mentioned in despatches four times, and promoted brevet-major in the Regular Army.

Lt.-Col. Little writes that he has been out of touch with motor cycling matters during the past four and a half years, but is very optimistic concerning the future of the pastime.

"One thing is certain," he states, "motor cycles have more than upheld their own in this war. How the necessary communication between formations could have been kept without them I cannot imagine. During the warfare of movement they had even more to do than during stationary warfare, and to say 'they did it' is the least one can say of them. Once the Army is settled down again in civilian life, I forecast a phenomenal demand for motor cycles. In fact, this war has made this, more than ever, a mechanical era, and every man, according to his means, will want some mechanical method of locomotion. I hope the fuel supply is being dealt

with sufficiently far ahead to meet the demand. Doubtless *The Motor Cycle* will do its share in reviving the old clubs, competitions, T.T. races, etc. These must be got going again, even if it is only for the sport that there is to be got out of them. Naturally, many of the old school of riders will feel a little past active participation, at any rate judging from myself, but, nevertheless, there is the coming generation to consider."

DRIVING BOTH WHEELS OF A SIDECAR OUTFIT.

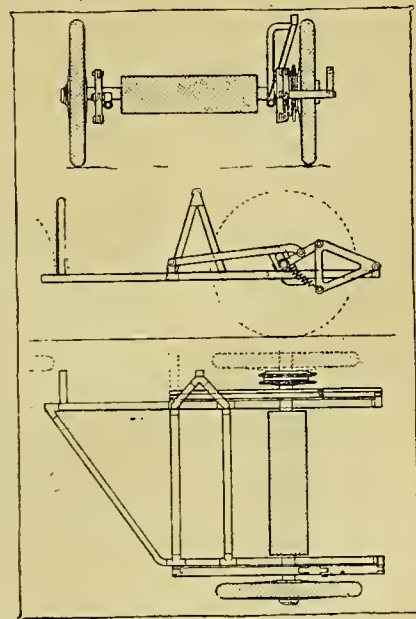
A SIDECAR outfit having both rear wheels driven is the subject of a patent taken out by Mr. W. F. J. Simpson, of Reigate, Surrey. The design is interesting because, despite its differential and apparent complication, it still retains the main elements of a sidecar, inasmuch as it can be detached from the motor cycle in order that the latter may be used as a solo machine.

That is its main feature; were it integral with the motor cycle frame, it would be but a hybrid runabout without the latter's advantages—i.e., protection for the driver from the elements.

The drawings reproduced are from the patent specification, but letters we have received from the designer state that he has more fully developed the idea, and probably will make a machine.

As will be seen from the drawings, both rear wheels are sprung, and, it is claimed, both wheels retain their relative position to each other by means of a link motion, thus avoiding strains on their respective frames.

The sidecar wheel is driven by an "axle" shaft, which is connected to the rear wheel of the cycle through a differential. The latter is carried in the hub of the motor cycle wheel, and, if the sidecar is detached, it may be locked up, thus permitting the machine to be used as a solo mount.



A patented sidecar chassis with driven wheel and differential.



Lt.-Col. W. B. Little, D.S.O., M.C.

International Six Days, which, it will be remembered, was abandoned at the outbreak of war. "The Motor Mountaineer" was forced to give up his machine, receiving in exchange a receipt from the British Consul at Lyons.

LETTERS TO

THE EDITOR



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

THE THREE-JET BINKS CARBURETTER.

Sir,—Regarding the recent correspondence which has taken place in your columns *re* the Binks carburetter and controversy about "dead spot," we may say that of our half-dozen motor cycles the last two were fitted with the Binks carburetter, and this carburetter has always given us the greatest satisfaction, and we would sooner any day have a Binks carburetter plus a controversial "dead spot" than any other motor cycle carburetter on the market.

For the combination of easy starting, slow running, acceleration and economy, there is no carburetter that can touch it.
JAMES MONTEITH AND SONS.

RUSTLESS STEEL FOR MOTOR CYCLES.

Sir,—In your report of a paper read before the I.A.E. graduates at Coventry, it is stated that "this steel is of very good quality, approaching B.N.D."

It certainly is of good quality, but is a long way from B.N.D., at any rate as regards tensile. Stainless or rustless steel has an ultimate tensile of forty tons per square inch, whereas that of B.N.D. is about a hundred tons. Stainless steel would find its best use in exhaust valves, for which it has been very largely used in place of tungsten steel. It is easier to machine and nearly as good in regard to pitting, absence of deformation, etc., as the latter.

ERIC W. WALFORD.

OPINIONS.

Sir,—Having read the series of "Opinions" by men prominent in motor cycling, it seems to me that, though there are obvious advantages in concentrating on as few models as possible, there are so many different types desired by the public that, to cater for all, several models will have to be produced.

There is an evident desire for higher powered lightweights; yet the low-powered lightweight still requires advancement in order to see to what standard of efficiency the ultra-lightweight can be brought.

The comparative cheapness of the sidecar outfit lies in the fact that the motor cycle can be sold either for solo use or with the sidecar; but as few people ever detach the sidecar, except for getting at parts otherwise inaccessible, could not the same machine be sold, but with a different frame? Then the solo machine could be made with a frame suitable for solo use, and the sidecar made a permanent fixture; the same engine, gear box, transmission, and wheels being used in both cases. This form of manufacture might lead to the production of a cheap cycle car

or runabout, also a motor cycle by the same firm. If the cycle car were made within the same limits of weight as the average sidecar outfit, a 6 h.p. engine ought to be ample.

One firm one machine is becoming the motto at present; but could not firms producing different models combine together, and so lead towards interchangeability of parts amongst different models?
R.E.C.

Chatham.

LEAKAGE OF MAGNETISM.

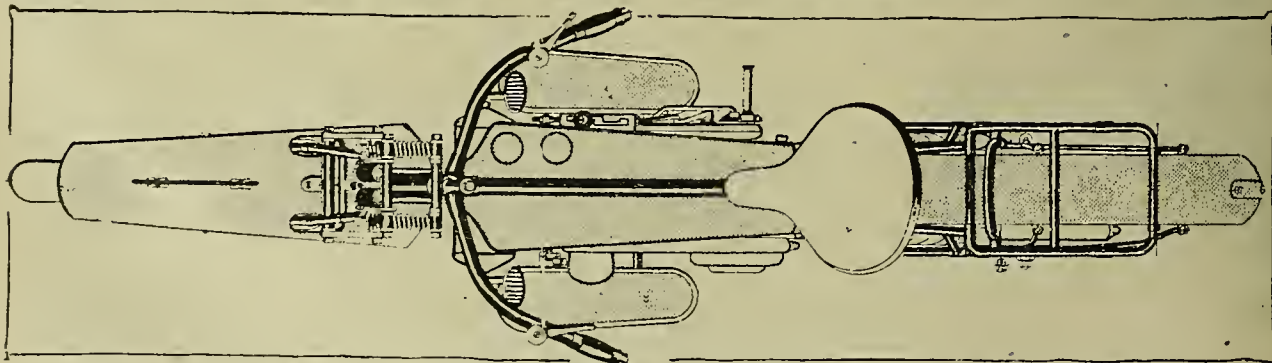
Sir,—As an electrical engineer, and one who has had considerable experience in magnetos and automobile equipment, I have been very much interested in the controversy *re* the loss of magnetism in the Dixie magneto. To anyone who has studied elementary magnetism it is at once apparent that the magnetism in the Dixie must necessarily deteriorate, as the end of the shaft on which the driving sprocket is fixed is, to all intents and purposes, one pole-piece of the magnet. Consequently, the passing of the chain over the sprocket and on to the engine is a direct magnetic connection to the frame, and when travelling must set up a perfect magnetic touch. By "touch" I mean method of conveying magnetism from one point to another. Hence, as the frame of the machine absorbs the magnetism, the magnets of the magneto must become weaker.

The only cure I can suggest is the one that has already been mentioned, viz., fitting a gunmetal sprocket.

I notice "N.P.D." has done this, and remarks that a pin will still adhere to the teeth of the driving sprocket. If he still has the same driving chain on, this would cause the above effect, as the chain would retain its magnetism. If the effect is there without the chain, then I assume it must be a very small sprocket and the magnetism is purely of an inductive nature, which is by no means serious.

Regarding "F.C.C.'s" complaint of soft steel, he is perfectly correct in his assumption that permanent magnets must be of hard steel.

Whilst writing you, I would like to say that it is up to us motor cyclists to support home industry all we can, and particularly this section, as we can produce, and are producing at the present time, the finest examples of magnetos in the world, superior by far to any foreign product that ever flooded our market. This is a fact that I find requires some driving home; but I can assure all your readers that the usual standard of efficiency and reliability so synonymous with the word British is applicable to nothing so much as the present British magnetos.
SPARK.



Plan view of the new 8 h.p. peace model Clyno, an illustrated description of which is given on pages 184 to 186 of this issue.

MAGNETO DRIVE AND POSITION.

Sir,—I have read "Vedette's" article on "Magneto Drive and Position" in the January 30th issue of your very excellent paper with much interest.

I was rather surprised, however, to notice that, possibly inadvertently, no mention was made of the magneto transmission system employed on the Douglas.

I feel sure that many readers will agree that, in point of view of absolute freedom from dirt, extreme accessibility, simplicity of design, silent running, and general reliability, this type has much to recommend it.

I would, of course, add the usual disclaimer, being merely a very satisfied rider of this popular mount. 4 H.P.

Highgate, N.

Sir,—I notice that an eccentric drive for the magneto is suggested by a reader, and illustrated in the issue of the good old *Motor Cycle* for January 30th. Perhaps he would be interested to know that such a drive exists on my $4\frac{1}{2}$ h.p. twin Minerva, and also that it is quite satisfactory. Whether this was fitted by the makers or added since, I do not know, but I understand the old 'bus won the Jarrott Cup somewhere about 1913, so it may have been a special fitting.

LEONARD S. MASON.

[The Minerva drive referred to was standard, but differed considerably from that illustrated on page 107.—Ed.]

BENZOLE.

Sir,—I notice in two places in your issue of January 30th there is a complaint as to benzole being of poor quality from a motorist's point of view. I think if the producers would put benzole on the market it would simply walk away from petrol (war time), but I am sorry to learn that the toluol is not being taken out, and it will mean more sooted plugs after a few miles run.

Now as a user of benzole for a considerable time, it was my experience in early 1914 that I could run fairly well on benzole with the carburettor adjusted to suit the heavy fuel, but in October, 1914, the producers started to take the toluol for war purposes, and the result in my experience was: carburettor setting the same as for petrol, and not a sooted plug for a good 1,000 miles, more power, no knock, and comparatively easy starting. Now, sir, if we can only get the late 1914 product I for one will not bother about a smell of petrol, and it is up to the benzole producers to give us the best, and we will do the rest to "encourage home industries."

98%.

Rotherham.

Sir,—I should like to say a few words as regards the benzole question. A great many motorists before the war would not use benzole, because of the injury done to their tanks, owing to the imperfect washing which was then prevalent (washing being a necessity for the production of 90% benzole). Perhaps many readers are not aware that out of each 100 gallons of crude benzole so washed and distilled only about forty gallons become available as motor spirit. Many motor cyclists have seen the splendid working results obtained with 90% benzole, but could not be persuaded to try it themselves, but we hope such grandmotherly ideas have disappeared, and that encouragement, by buying benzole, will be given to the benzole producers. All appearances tend towards the petrol combine endeavouring to control the market. By so doing home-produced fuel will disappear, thus making motoring available only for the rich.

I hope to be able, when restrictions permit, to convince motorists that benzole is superior to the best petrol. A home-produced fuel which I hope to place upon the market has the following advantages: No knocking or konking of the engine under ordinary working conditions, the fuel does not injure the tank, but, according to my experience, preserves it, and also has lubricating properties for the engine, and will give 20% better mileage with increased power, the fuel requiring considerably more air than petrol.

If the petrol combine put petrol on the market at 1s. a gallon this fuel would always be able to compete with it, for, in my opinion, when motorists become acquainted with the fuel they will not return to petrol. This fuel is and is not a substitute, and I can assure you that it will fire more readily than war-time petrol from cold, and good working results can be obtained in company with alcohol.

Longton.

MOTORIST.

REAR LIGHTS ON CYCLES.

Sir,—Re your article "Rear Lights on Cycles," as a "pedalist" I should like to endorse the remarks contained therein. I never used but one light until regulations demanded two, but I shall continue to use two lamps whether the law be repealed or not. They have no doubt prevented many an accident, both to the user and to other *habitués* of the road. Why some people should wish to abolish the rule is beyond comprehension, and it is liable to give the push-cyclist fraternity a bad name as an unsportsmanlike crowd, but I am sure the majority of cyclists neither wish to discard nor will discard the rear light. The "Hunnish" ones who would do away with this small additional extra and save a few minutes a week cleaning the lamp at the expense of other users of the road should be planked in a field together and marked "Highly dangerous."

ONE WHO WILL STICK TO THE REAR LIGHT.

Watford.

Sir,—Cpl. Elsie raises the question of red rear lamps, and without venturing any opinion as to the rights of his controversy with your contemporary's correspondent, may I assert my conviction that he is one of a very small minority in his affection for this fitment, the need for which, on cycles and motor cycles, could only be really justified when the reduction of the power of head lights to a minimum was a necessary precaution against air raiders.

The compulsory use of a rear lamp in normal times imposes an unnecessary and unfair burden on the rider, who, owing to the position of the lamp, is generally quite ignorant of the fact when the light gets accidentally jolted or otherwise put out, and he is nevertheless held to account for the unintentional and often unavoidable infraction of the law. The rear lamp law, furthermore, is a direct encouragement to the reckless or careless driver, who trusts to the red lamp to enable him to avoid collision with overtaken vehicles, and, in case of accident, can shift all blame from his own shoulders to those of the other party, by asserting the latter had no rear red light—an assertion which cannot often be disproved, unless the light miraculously survives.

There are a few motorists (I ought to say motor carists) who claim that because they are compelled to carry a rear lamp so ought all other vehicles, but I am sure the majority recognise this to be a false claim, as the primary purpose of the rear lamp on a car was not to show a red light but to illuminate the number plate.

I would suggest that carists should agitate for the law to be amended to allow them to illuminate either back or front plates at their discretion, like motor cyclists, and to combine with motor cyclists and cyclists, and indeed all vehicle users, to advocate the abolition of red lamps for any sort of vehicle, and the definite acceptance of the principle that the onus of responsibility for avoiding collision rests with the overtaking driver, whose speed should be no greater than his head lights justify.

GEORGE E. L. SHERRATT.

WHICH TYPE?

Sir,—Your correspondent "One of the Old (Motoring) Gang" has touched on a subject which has been written about time after time, and, in spite of it all, the majority of manufacturers to-day still cling to nickel-plated handlebars, etc., in the same way that they do to the glorified push-bicycle type of front brake.

As manufacturers are now advertising the fact that they have gained a vast amount of experience during the past four years, surely they must, by this time, have come to the conclusion that there is far too much nickel on the average motor cycle. If they have not, let someone stick a pin in them, and try and turn a small part of their revs., torque, and valve-timing thoughts towards common things like mud, rain, and rust.

About eighteen months ago, I was in a Red Cross hospital, where all the table knives were of rustless steel, which never needed cleaning, never rusted or stained, and were always bright. If we must have bright parts, why not rustless steel?

I agree with "One of the Old (Motoring) Gang" that enamel is far better than nickel plate, especially if one does any amount of all-weather riding or lives in a "dreary and rain-swept part of the globe" like "One of the Old (Motoring) Gang."

DON PIP.

Colchester.

ADVANTAGES OF A TWO-STROKE.

Sir,—I belong to that class of "would-be motorists" to whom the cost of the present high power combinations is prohibitive.

I was exceedingly interested in Mr. F. W. Varney's letter of February 6th describing his experience with a 2½ h.p. Levis and sidecar. Now this is about what I want, but is it really a feasible proposition, as the opinion of my motoring friends seemed to be summed up in "Well, old man, of course, it can be done, but it simply lugs the engine to bits in a season."

That "lugging to bits" process sounds a bit expensive in repair bills.

I may say my weight is 12 st. and passenger 10 st., roads good, and hills moderate. I do not, of course, expect speed, but I do want reliable, economical running. Can some readers help me with their experiences with 2½ h.p. and light coach-built sidecar, with some idea of the running expenses?

Luton.

ENQUIRER.

Sir,—I hope your readers will forgive me for again bringing in the long-discussed topic of average speeds. But surely the average speeds which F. W. Varney claims in your issue of February 6th are, to say the least of it, a trifle tall for a 2½ h.p. two-stroke.

Surely "F.W.V." does not seriously claim to have averaged 35 m.p.h. with a coachbuilt sidecar attached. May I enquire over what distances, and under what conditions, this speed was attained?

As for his claim of an average speed of 45 m.p.h. solo, surely he is mistaken. I myself ride a certain very well-known 3½ h.p. long-stroke single, with a guaranteed speed, and have never yet managed (on any machine) to average 45 m.p.h. over any distance worth talking about, although I can claim to have put up some fairly good averages over the New Forest roads before the war, but, in my opinion, a person who claims to put up such speeds over long distances is either a very good rider riding under exceptional conditions, or a road hog of the worst type, and, what is more, I am positive that no two-stroke (unless specially tuned up, stripped, etc.) could possibly average such a speed. I will admit the Levis is an admirable little "bus," but I do not think people ought to put forward such claims about a machine which is only meant for light solo work.

H.C.T.P.

Abingdon.

Sir,—What is the object of Mr. Varney's letter *re* the Levis? Every experienced motorist can only think "it may be true, but —," while many would-be motorists can be very badly misled by it. Personally, I must say it reads like a bad bit of "leg-pulling." Any motorist knows the Levis pulls well, but the makers will not thank Mr. Varney for claiming it to have the powers of a 5-6 h.p., or even a 7-8 h.p. twin. If the gradients mentioned are "dreaded" hills, and he can take up three passengers besides himself, I suggest he send his engine back to Messrs. Butterworth at once to be carefully investigated by a committee of experts, to discover the reason of its phenomenal powers. If his statements are accurate, we now know that the highest power any motor cyclist wants can be achieved by a single-cylinder of Levis dimensions, formerly absurdly rated at a 2½ h.p. in error. May I also congratulate both rider and engine on the remarkable average speed attained. Taking present-day roads into account, the makers must have presented him with a special frame as well as a special engine, to take a sidecar with three passengers at anything approaching 35 m.p.h.

H. F. MOHUN.

THE FUTURE OF SURPLUS GOVERNMENT MACHINES

Sir,—Having read your contributor "Cantab's" article and the letter from H. Haskins on this subject, I have come to the conclusion that it is high time someone put in a word on behalf of the "riders" as distinguished from "trade" interests.

Nothing, to my mind, would be so infinitely bad in policy or so conducive to a continuation of profiteering, as for the Government to allow the trade to "scoop in" all or most of these war-worn machines at a flat rate, so that after being repaired they can be resold to the public at an immense profit. "Cantab" must have had his tongue in his cheek when he naively suggests that this proposed method of disposal is mainly to protect the trade. He anticipates then that the private buyer would be on a good thing by purchas-

ing directly from the Government. I am afraid this kind of proposal is not very convincing, and the only consolation "Cantab" can offer after the poor shorn lamb has been fleeced is the makers' guarantee.

It would be interesting to know what makes Mr. Haskins so firmly of the opinion that no one except the makers would be able ever to get the machines in satisfactory condition again. His suggestion about controlling profits is — Well, now, how could anyone control profits on the resale of machines whose condition, when purchased from the Government, ranges from "scrap iron" to, say, a punctured tyre?

No; the only right and proper way to dispose of surplus war material is to sell by public auction to the highest bidder after reasonable notice, and I think you will find that you have a tough job in trying, as you have been latterly, to convince the majority of your readers to the contrary.

I may add that I have no connection with the motor cycle industry.

SUNBEAM.

THE CONTROL OF AEROPLANE ENGINES.

Sir,—May I venture to criticise some of the remarks made by "Torque" in his article on the control of aeroplane engines in your issue of January 16th? To begin with, he is always very vague as to the type of engine upon which he is discoursing, and it is quite hopeless to attempt to make any statements applicable to all aero engines. Not only every make of engine, but also every individual engine itself, differs to some extent from every other.

With reference to his statements in regard to oil pressure, I am afraid I can hardly agree with him. Some engines have two oil-pressure gauges—high and low. It is only on the low-pressure gauges that I have ever noticed the pressure to be excessive when starting up from cold. Most engines have just the high-pressure gauge, and this, when starting up from cold, almost invariably gradually attains its correct pressure, and there it sticks, unless there is a leak or an obstruction in the oil circuit.

I have never seen or heard of anyone stopping an engine after a three or four minutes' run to allow the oil to warm up; and in my experience, even in the coldest weather, the oil is always sufficiently warm to permit of running up by the time the water is warm.

Then with regard to the rev. counter. Almost every engine has its own set of revs. It is very rarely that any two engines do the same number of revs. when going all out. Also different pilots have different opinions very often as to the normal revs. of the same when flying level. Some always rev. an engine much faster than others.

Then, again, I have never heard of an engine being run up and down on each separate ignition system. Just run the engine to its full ground revs. once and have done with it, or else it will probably be so hot that it is boiling after climbing a few hundred feet. Very often, if the pilot knows his engine, he does not run it all out on the ground at all, but only runs it up sufficiently to make sure it is firing quite evenly and is pulling steadily.

If the pilot wishes to gain height directly he takes off, he will usually open right out while actually getting off, and then throttle back a little.

May I add that with the average stationary engine a pilot is very unlikely to lose his prop. when descending, as the throttle should be set so as to tick over nicely on the ground when pulled right back? I hope "Torque" will be more explicit in future.

R. A. BUTT.

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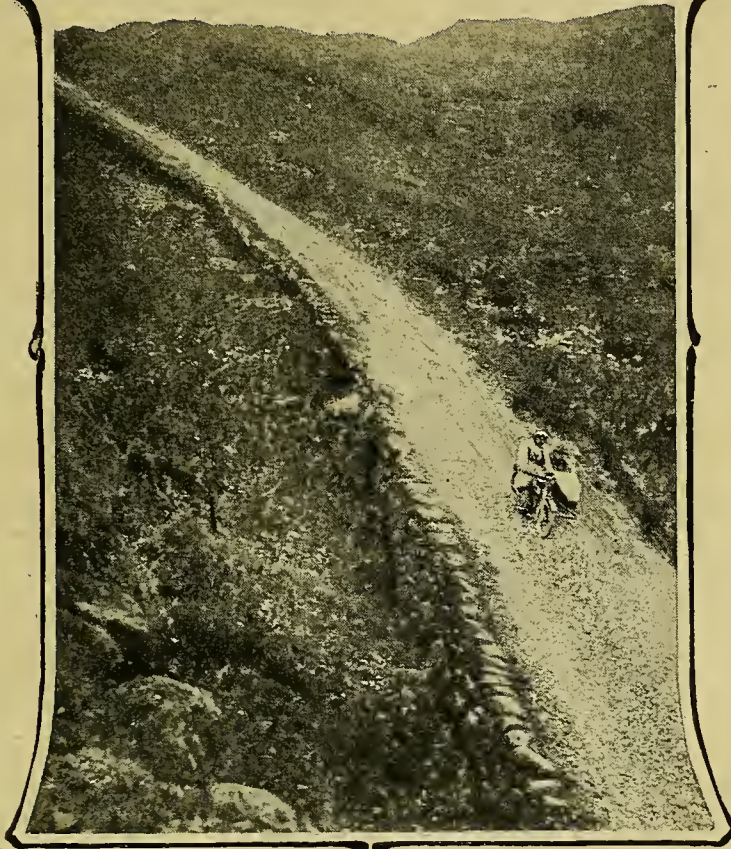
BRAKES

SOME CRITICISM AND SUGGESTIONS FOR SIDECARS

THE war has not done much in developing the efficiency of brakes. Much has been learned from the conditions obtaining in the war zone as regards the strength and durability of frame design, while the development of the aero engine will doubtless have a widespread effect on petrol engines of all kinds. But what about brakes? Aviators do not require them, neither do the majority of military motor cyclists. The latter figure for the most part in flat country, where the mud or the dust or the sand pulls them up whenever they close the throttle. Their trouble is not in stopping, but in keeping going. If the conditions happen to be more homelike, then the most they require of the brake is an occasional retarding effect, such as is required in traffic or in ordinary flat country touring. Any variety of brake will do this, but the brake for the heavy touring machine must do more—it must be capable of holding the heaviest load for long periods of grinding stress; of not only holding, but of bringing the machine to a standstill at any time, and of doing this day after day without rapid depreciation or loss of efficiency. The war did nothing to develop brakes, chiefly because the heavy sidecar machine was not much used in the Services, and where it was used brakes were seldom required. In a certain part of France at one time, however, motor cyclists were well qualified to discuss this subject.

A Searching Test.

The men rode heavy outfits, with three-up, and their riding mainly consisted of a mountain descent of eight kilometres and the necessary return. The descent was of an unrelenting houseside variety, with hairpins innumerable, the roads were crowded with transport, and often the journeys were made in darkness or under heavy fire. If ever men required good brakes on their machines these men did, but they lost all



One of the most difficult climbs in England—Hardnott Pass, Cumberland, and the venue of many hill-climbing parties before the war.

interest in such attachments. The machines they rode possessed what is unquestionably the best brake on the road, but so that it should retain gripping power it was necessary copiously to inject petrol every trip, and, as the friction surfaces were inaccessible, the natural result was that the existence of the brake was ignored.

On any one of the machines one could stand on the pedal with one's full weight on even a moderate portion of the gradient, but with top gear engaged it was impossible to hold the machine. Consequently the clutch with a stationary engine was forced to serve as a brake. In one of the pre-war six days trials, after four days, 90% of the brakes struck work, and the gears were forced to perform two functions.

The Clutch as a Brake.

One learns to become pretty handy with one's gear lever, but the system is not good. The dog teeth of the clutch are only deep enough to stand the torque of the engine, and the additional strain of braking soon begins to tell. There comes a day when the low-gear dog jumps, and when once it has jumped it can never again be depended upon. It will jump when most required to hold, plunging one headlong into a train of *ravitaillement* or over the edge of a precipice. Moreover, though the immediate retarding effect of slamming in a low gear is great, it is not lasting, and after the first sudden drag, the first acceleration of the engine being completed, the machine proceeds to gravitate, while, over and above all this, the efficiency of the engine as a brake is no excuse for the inferiority of the brake itself.

Now the effect of the clutch on a *stationary* engine is excellent in its strong and progressive retarding effect, taking it, of course, that the compression holds. No brake can compare with the clutch in performing that function, it wears well, and can be depended upon

Brakes.—

for long usage. This leads one to think that the best type of brake for heavy sidecar outfits would be of the metal plate variety contained in the back wheel. It would be heavy, of course, but so, for that matter, is the metal-to-metal expanding, and as regards expense—well, most sidecar riders would not object to parting with the dubs to ensure the possession of a sweet, durable, and powerful brake. Indeed, I think there is nothing more distressing for the ordinary amateur sidecarist than that feeling of insecurity which arises from lack of confidence as regards stopping the machine. With solo machines the simplest type of brake is the best. It is a visible, open air proposition, easy to rejuvenate, and practically infallible.

A hand brake one could notch would be a most valuable fitment for a sidecar machine, though, of course, useless for a solo mount. By sidecar machine I mean any type of vehicle that can be classed under the same heading as the sidecar, though really we have less to grumble at than have the light car people. I have driven light cars which one simply could not hold even on a moderately severe West Riding gradient, one or two small Americans being absolute horrors

in this respect. On drawing back the brake lever a rather harsh grinding noise issued from the vicinity of the rear wheels, but otherwise nothing happened. The car proceeded at its own sweet will towards whatsoever peril lay ahead, while one well-known make of light car, when driven solo, merely proceeded to jump about the road when the brakes were applied, and the more urgent the need for immediate deceleration the greater were its convulsions and the more unmanageable it became.

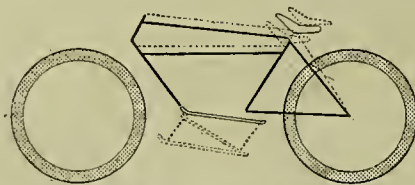
We conclude, then, that the ordinary tourist values a good brake above most things, and is quite willing to pay for one which will wear indefinitely and can always be relied upon. The expanding ring principle is doubtless the best at present employed, but it needs to be of ample dimensions and placed in such a position that it can easily be washed out, otherwise it will become inoperative owing to old oil and foreign matter fouling the friction faces. I believe that a simple design of plate clutch brake which could be more or less roughly made and readily adjustable would beat the expanding ring for durability, reliability, and sweetness of operation. Who will try it?

CHINOOK.

MOTOR CYCLING DISCOMFORT.

A Criticism and Some Suggestions for Designers.

NOW that post-war programmes are in the air and manufacturers are endeavouring to remember how a motor cycle was made, the time is opportune to call once more for special attention to a very important but much overlooked point in design. I refer to the question of fitting the machine to the rider. As things stood in 1914, a motor cycle was made in one size of frame to suit every rider whether a guardsman or a bantam. The adjustments provided, *i.e.*, saddle, bars, and, in some cases, footboards, were presumed to be sufficient to accommodate all riders. In consequence, only one rider in ten rides in comfort; the other nine put up with aching backs and wrists, cramp, saddle soreness, and all the discomforts which bad design coupled with bad roads can produce. I am a tall rider, over 6ft., and have never yet ridden in real comfort. A modern W.D. machine gave the best position I have found, and even that was tiring on long spells. The back foot-rests were almost directly below the saddle, and the boot heels hitched on, well—a T.T. position, in fact, but not to be recommended for long touring rides. Generally, my feet stick right forward on the front end of the footboards and perform a continuous step-dance.



Illustrating the extreme range of adjustment necessary to enable men of various heights to ride in comfort,

of 2in. to 3in. in the height, and the usual adjustments for position would then be sufficiently effective to satisfy most riders.

"Chinook" recently suggested several designs for adjustable footboards, and whilst they were a step in the right direction, they did not completely solve the problem. The directions of possible solution, as far as one can see at the present, are variable frame heights and adjustable footboards or rests. The tendency to larger ground clearance in many new models will facilitate the use of footboards giving a considerable difference in position. A variation of 6in. is not unreasonable, and a variable footboard angle is also necessary. Some riders consider adjustable bars an advantage, but general opinion is against them at the moment. Saddle adjustments should have a greater range of movement. I believe some firms have given much thought to this point in pre-war days, and they confess themselves so far baffled in finding a real

solution to the problem, but they must get down to it, or the motor cycle may find itself under a cloud of antipathy for one reason only—discomfort.

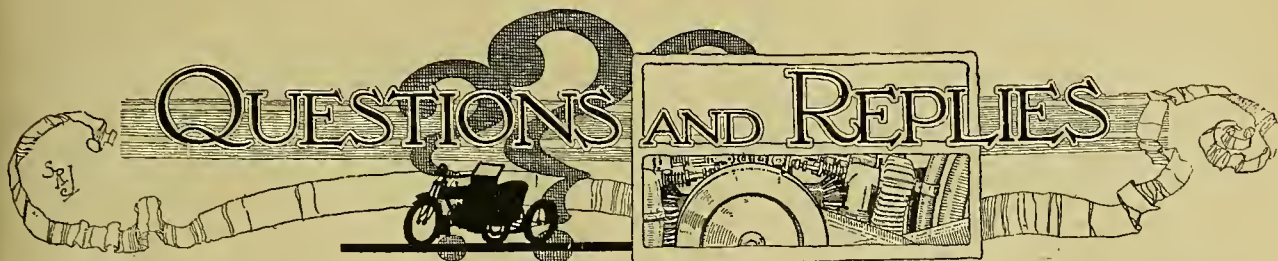
The firms who can devise some method whereby their product will be spoken of as "The most comfortable machine ever ridden" will capture a large market, otherwise lost.

The diagram merely indicates the extreme range of adjustments which are necessary to give comfort to riders of all sizes. It is a nice point as to how far the designers can go towards this ideal without unduly increasing the difficulties of manufacture and production.

F.A.S.

Some Suggestions.

The fault lies in endeavouring to fit the rider to the machine, when the machine should be made to fit the man. Perhaps it is too much to expect a series of frame heights as is available to purchasers of bicycles, and it may not be altogether desirable, but two sizes of frames could be marketed with a variation



A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C.4, and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

Water in the Carburettor.

? There is water in the float of my carburettor, and I should be glad if you would advise me as to the best method to remedy the trouble, as I think it is coming through from the tank. I may say I am using pure benzole.—A.B.R.

Water in the float is exceedingly rare; in fact, we should say almost an impossibility. A slight crack in the float will sometimes admit petrol or benzole; which, of course, must be got rid of by boiling out the petrol by immersing the float in hot water, and then soldering up the orifice. If you mean that water gets into the float chamber, the only way to stop it is to insert a very fine gauze between the tank and the carburettor which will pass petrol but not water. The tank should also be emptied and the water removed.

A Mysterious Trouble.

? I have a 4½ h.p. three-speed James combination, and recently took the engine down and cleaned it, decarbonised cylinders and pistons, cleaned valves, carburettor, and magneto contact breaker, etc. The machine was re-assembled correctly, the timing being unaltered, and a good spark is obtainable. The jet is a Senspray No. 38. Clearance between valves and tappets is correct. The machine runs well on the stand while cool, and on the road for about a mile, when it shows symptoms of overheating, and comes to a standstill with pronounced knocking. I had an expert to examine it, and he could find nothing wrong. Three different plugs were tried, without avail. Prices' oil is used liberally.—H.F.K.

Your proposition is rather a difficult one to solve without actually seeing the machine. The trouble seems to be due to overheating, which may be brought about by a variety of reasons: retarded ignition, i.e., timed late; too rich a mixture—see if the carburettor is not flooding owing to a bent needle, etc., and notice whether a great deal of air is taken. If there is not a fair quantity of oil in the crank case there will be great loss of compression after warming up, and the crank case will become hot. There may be some foreign substance in the cylinder becoming incandescent and causing pre-ignition. Have you replaced the washer under the cylinder? Omitting this, or using a thinner one, would increase the compression and, therefore, the ignition temperature. Are the valves

an easy fit in the guides and the stems clean? Note whether they are likely to bind on becoming hot, and finally, be sure there is no partial obstruction in the exhaust pipe or silencer to cause back pressure. If you have altered the gears or clutch they may possibly be working stiffly and have the effect of braking; or perhaps there is a tight bearing.

IMPORTANT NOTICE.

GOODS MADE IN GERMANY.

The proprietors of this journal, being fully in accord with the recommendations agreed upon at the Paris Economic Conference, give notice that they will not permit the advertisements of new goods manufactured in enemy countries to appear in this publication.

ILIFFE & SONS LTD.

Hub v. Countershaft Gears.

? (1.) Would you kindly tell me your opinion about having the three-speed gear in the hub of the back wheel instead of having a three-speed countershaft gear? (2.) Is there very much difference between them when running? (3.) Where are the J.A.P. engines made?—J.C.

(1.) A hub gear is usually of the epicyclic type, which contains numerous gear wheels and working parts. A countershaft gear contains fewer working parts, much larger gear wheels, and is infinitely more reliable. (2.) There is not a great deal of difference so far as running is concerned, but the hub gear places all the weight in the back wheel which is not considered desirable. (3.) The J.A.P. engine is manufactured by J. A. Prestwich and Co., Ltd., Northumberland Park, Tottenham, London, N.17.

READERS' REPLIES.

Variable Ignition on F.N.

"H.H.T." in your issue of January 23rd makes an enquiry re adaptation of Bosch magneto, fixed timing, to give variable ignition. I had this done to an F.N. single-cylinder with very satisfactory results, and the job is quite an easy one. If a slot is cut on the timing case, extending ½ in. or so both ways from the small screw which holds it in position normally, the main part of the work is done. This slot should give the necessary

spark radius, and should coincide approximately with the sparking range of the magneto. A slightly larger screw will probably have to be substituted so as to tighten in position without actually gripping the timing case. It is also advisable to test the magneto for spark at all points in its new radius, as otherwise there may be starting difficulties. The controls I obtained ready to fit the F.N. from Earl and Co., Heath Street, Hampstead. I should be very grateful for any readers' experiences of a multi pulley (Grado, etc.) fitted to a single-speed two-stroke (Villiers engine), re ease of fitting, belt wear, etc.—JOSEPH BARRY.

In reply to your correspondent "H.H.T." in your issue of January 23rd, the above is really unnecessary if he has a two-speed machine, the engine having four cylinders. With an Amac carburettor I can throttle down to about 7 or 8 m.p.h. on top and climb splendidly. A pre-war friend of mine, a great F.N. expert, had variable ignition with a single speed, and I wanted it on my two-speed, but he dissuaded me, as he only used it slightly on stiff hills. I now find he was right. Fit new inlet springs after about 1,000 miles or so. As "H.H.T." may know, many cars have fixed ignition.

Dismantling a Gear Box.

In answer to enquiry by "J.W.O'N." on dismantling American Excelsior gear box, in January 30th issue, if he does as you mention, gets two wedges and drives them fairly tightly between the gear box and clutch, he will find that on giving the gearshaft a smart blow the clutch will easily come away. As to the kick-starter side, if he looks at the bottom of the gear case on the clutch side he will notice a hexagon head. By unscrewing this he will be able to draw the kick-starter completely away after disengaging the return springs. I would give a word of warning to "J.W.O'N." not to take the gear to pieces unless he has the proper tools with which to work, as the gears run on ball bearings, which are pressed on the gearshafts. There are no left-hand threads in the gear box or fitting.—J.E.M.

RECOMMENDED ROUTE.

HOYLAKES TO DISS.—W.H.R.

Hoylake, Chester, Tarvin, Over, Middlewich, Holmes Chapel, Congleton, Leek, Ashbourne, Derby, Loughborough, Melford, Mowbray, Oakham, Stamford, Peterborough, Wisbech, Downham Market, Stoke Ferry, Mundford, Thetford, East Harling, North and South Lopham, Diss. Approximately 225 miles.

SPARKLETS



M.P.G.

The makers of the Sun-Vitesse two-stroke guarantee a petrol consumption of at least 100 m.p.g. with their 1919 models.

Holdtite Patches.

We have received information that the Surridge Holdtite patch is being handled for export purposes by Morris, Russell and Co., Ltd., 75, Curtain Road, London, E.C.2.

Wooler's New Home.

We have been asked by the Wooler Engineering Co., Ltd., to state that during the completion of their new works at Alpertown they are occupying temporary offices in that town, and all communications should be addressed there in future.

Two-strokes in War.

The two-stroke engine has been used quite extensively for stationary purposes connected with the war. Upwards of a hundred 2½ h.p. Peco engines were used to drive trench pumps, and before acceptance by the authorities had to pass a six hours' running test on full load.

A Sparking Plug Box Spanner.

To avoid the spoiling of their brass plugs by the use of ill-fitting spanners, the Apollo Manufacturing Co., Ltd., Moseley Street, Birmingham, are prepared, on receipt of sixpence, to send to users a box spanner designed for their plugs. When asking for the spanner the name of the motor cycle in which the plugs are used should be mentioned.

A Doncaster Agency.

The makers of the Wilkinson carburetter have opened new premises at 19, Silver Street, Doncaster, as agents and repairers of motor cycles and accessories.

Temporary Address.

As a result of the recent fire at Birmingham, Messrs. S. Smith and Sons (Motor Accessories), Ltd., have secured temporary offices, at 2, Great Western Buildings, 6, Livery Street, Birmingham.

Robbialac Leaflet.

Motor cyclists who wish to re-enamel their sidecars and machines may find the instruction leaflet, issued by Messrs. Jensen and Nicholson, Ltd., Goswell Works, Stratford, E., of assistance.

New Manchester Agency.

A motor cycle depot is to be opened at 229, Deansgate, Manchester, chiefly as an agency for Norton and Royal Ruby machines by Mr. T. Davies, captain of the Stockport Motor Club.

An Adjustable Windscreen.

The makers of the windscreen described in *The Motor Cycle* of the 6th inst.—Messrs. Ollard, Westcombe and Co., 46, Great Charles Street, Birmingham—find that it will be three weeks before this fitting can be marketed, and they will be unable to accept orders for the time being.

A Useful Diary.

We are in receipt of an extremely well-got-up diary published by Messrs. George Spencer, Moulton, and Co., Ltd., which contains a few facts interesting to students of the Great War, such as a list of medals, ribbons, and decorations, which enable the ordinary person to distinguish these. Interesting facts of value to motorists are an English-French dictionary of motoring terms, a list of some of the important motor records, instructions how to register a car or motor cycle, a list of motor index marks, and a map of the Great War, Western Front.

Fuel Supply.

We are advised that Messrs. Crow Bros., 190, High Street, Guildford, are in a position to supply benzole in two-gallon tins.

British Magnetos.

At a dinner of the staff of the M-I Magneto Syndicate, Ltd., it was stated that from an output of about eight magnetos per week in 1914 the figure at the present time is nearly eight hundred per week.

New Showrooms.

Extensive offices and showrooms have been opened by Messrs. Burney and Blackburne, Ltd., at 166-168, Shaftesbury Avenue, London, W.C.2. All communications regarding the sale of Blackburne motor cycles and engines should be sent to this address.

The Bowden Brake Co.

We are informed by the Bowden Brake Co., Ltd., Tyseley, Birmingham, that the capital of the company has been increased to £75,000.

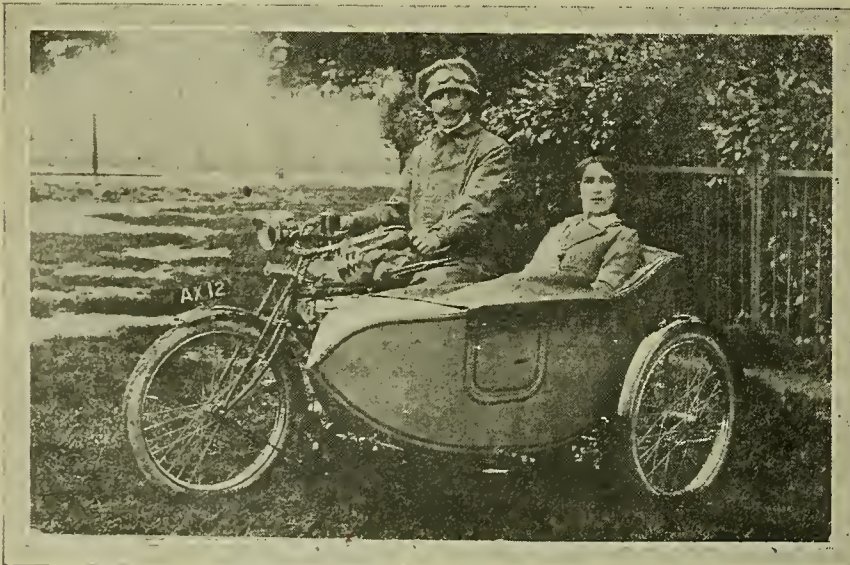
Mr. R. Melville Brown, 24a, Queen's Parade, Friern Barnet, London, N.11, has been appointed representative for London and the surrounding districts.

Messrs. Rudge-Whitworth's War Work.

Our readers will require no reminder of the services which have been rendered by motor cycle manufacturers to the nation in its hour of need. Practically every imaginable type of war implement has been produced in the different factories devoted in peace time to motor cycle production. To demonstrate the comprehensiveness of the range of war impedimenta produced by Messrs. Rudge-Whitworth, Coventry, a special exhibition was recently arranged at their London premises, 230, Tottenham Court Road. The following list contains a few of the items they have manufactured, and will give a fair idea of what has been done: A bullet-proof shield, part of aeroplane landing gear, lance bomb, bombs ranging from 16 to 230 lb., various shells, water pump for aeroplane, depth charges, barbed wire-cutters, tachometer drive for aeroplanes, carburetter for aeroplanes, shell fuzes, and aeroplane wheels.

AN EARLY BRISTOL MOTOR CYCLIST.

WHEN Mr. Herbert A. Camer first started riding he did not meet more than an average of two or three machines per week, and his friends thought that he would encounter a terrible fate on those "dreadful motor cycles, which ought to be put a stop to." We may mention that at this period he did a good deal of sidecar driving, the sidecar being a trailer with one wheel taken off and the arm bent round to make a connection to the motor bicycle frame. In this machine, attached to a twin Clement-Garrard built up of Chater-Lea parts, Mr. Camer did an extensive mileage, driving on the open country roads and in traffic from the sidecar—no mean feat in those days when no change speed gear or clutch was fitted.



Mr. Herbert A. Camer, of Bristol, and his 4 h.p. Triumph sidecar. (See paragraph accompanying.)

MISCELLANEOUS ADVERTISEMENTS.

PRICES.

ADVERTISEMENTS in these columns—First 12 words or less 2/-, and 2d. for every additional word. Each paragraph is charged separately. Name and address must be counted. Series discounts, conditions, and special terms to regular trade advertisers will be quoted on application.

Postal Orders sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd., and crossed & Co.**

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.4), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge, which must include the words Box 000, c/o "The Motor Cycle." Only the number will appear in the advertisement. All replies should be addressed No. 000, c/o "The Motor Cycle," 20, Tudor Street, E.C.4.

DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pays carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged, when under £10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

MOTOR CYCLES FOR SALE.

A.B.C.

A.B.C.—Earliest delivery.—Sole Agent for Shropshire, J. C. Pickering, Shrewsbury. [4123]

A.B.C.—Earliest deliveries. Your name on our list ensures this.—Martin Mitchell, Ltd., Stafford. [X4050]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery of the new A.B.C. [2254]

WE Are Now Booking Orders for earliest deliveries of A.B.C. motor cycles. Secure an early delivery by placing your order with us now.—Dunwells' Garage, Wigan. Tel.: 328. [X3218]

A.J.S.

A.J.S.—For 1919 models and service, Taylor, Garage, Weynesbury. [3774]

A.J.S.—Earliest delivery of 1919 6h.p. combination.—J. C. Pickering, Shrewsbury. [4124]

CROW Bros., Guildford.—A.J.S. Agents since 1912. Write us for your requirements [9777]

1917 A.J.S. 6h.p. Twin; £80.—Elice and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0480]

1919 A.J.S. Combinations.—Write Merrick's Stores, 174, Listerhills Rd., Bradford. Phone: 2439. [X2430]

A.J.S. Combinations.—Book your order now for earliest possible delivery.—Parker's, Bradshawgate, Bolton. [X4193]

WANTED FOR SPOT CASH SECOND-HAND MOTOR CYCLES AND LIGHT CARS.

Highest prices offered for all makes; preferably not earlier than 1914.

Distance no object. Representative sent to inspect. Cash paid on sight. Machine driven away.

This will save you all worry and trouble of trial runs and all risks.

THINK IT OVER. IT WILL PAY YOU.

Send for List of Second-hand Machines. All overhauled and guaranteed.

MAUDE'S MOTOR MART, 100, Gt. Portland St., W.1.

Telephones: Mayfair 552; Museum 557.

Telegrams: "Abdicale, Wesdo, London."

MOTOR CYCLES FOR SALE.

A.J.S.

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery of the new A.J.S. [2255]

A.J.S., 1915, 6h.p., with Millford sidecar, spare wheel complete, oversize tyres, condition perfect.—Parker's, Bradshawgate, Bolton. [X4202]

A.J.S.—For quick deliveries try the sole Leicester-shire agent, Will Chapman, 113, Belgrave Rd., Leicester, the first appointed A.J.S. agent. [5531]

A.J.S. 4h.p. Lata 1916 Combination, indistinguishable from new, but better, interchangeable wheels, fully equipped; £95, no offers.—Reynolds, Waterbeach, Cambs. [4135]

A.J.S.—For the earliest possible deliveries of 1919 models, advance specifications and super service, try the A.J.S. Specialists, The Walsall Garage, Wolverhampton St., Walsall. Phone: 444. [X0125]

24h.p. A.J.S. Combination, 1914, 2 speeds, kick start, Watsonian Light C.B. sidecar, lamps, horn, tyres as new, would separate; £50, or £40 solo.—F. Briggs, Summerfield, Hartlebury, near Kidderminster. [X3986]

A.J.S. 6h.p. 1915 Combination de Luxe, mileage about 5,000, screen, spare wheel, 3 Lucas lamps and horn, Coway, etc., just overhauled by makers, first-rate condition; £110.—L. Williams, 11, Grange Rd., Dudley. [X3990]

1916 6h.p. A.J.S. Combination, as new, unscratched, spare wheel, Watsonian speedometer, 3 lamps, generators, Lucas horn; cost over £150, price £115, or near offer.—Pearse, 4, Nursery Walk, Worcester. [X4148]

1916 A.J.S. Combination, 5-6h.p., 3-speed and clutch, lamps, horn, hood and wind screen, etc., very good condition; 97 gns., near offer. Wanted, 8h.p. J.A.P. engine and magneto.—9, High St., Rushall, Kent. [4340]

A.J.S. Spares; prompt delivery.—Cyril Williams, Chapel Ash Depot, Wolverhampton. [9189]

Alder.

ALDER, 2½h.p., 2-stroke, 1915; £25, or nearest; lamps.—Box 2,877, c/o The Motor Cycle. [X3994]

Alldays.

ALLON.—J. O. Pickering, Shrewsbury. Orders now being booked for earliest delivery. [4125]

ALLON, 1915, 2-stroke, 2-speed, just overhauled, as new; £36.—37, Malvern Rd., Surbiton. [X4077]

ALLON.—Earliest deliveries. Your name on our list ensures this.—Martin Mitchell, Ltd., Stafford. [X4070]

ALLON 2-stroke, 2 speeds, and hand-operated clutch, delivery from stock.—Parker's, Bradshawgate, Bolton. [X4198]

ALLON 2-stroke De Luxe, 2 speeds and clutch; £55. —Isle of Wight agents, Witham Bros., Newport. Wight. Early deliveries. [3686]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery 2-speed and clutch Allons, £58; also De Luxe models, with kick start, £65. [2258]

ALLDAYS Allon.—We have seven of these in stock. 1918 2-speed, like new, £48; 1915 2-speed, £33/10; and two 1916, price £42/10; two 1917, 2-speed, hand clutch, £44 and £46/10; and 1918, 2-speed, hand clutch, and featherweight sidecar, £65; all complete with accessories.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [4196]

Antoine.

ANTOINE 5-6h.p. Twin, nearly new condition, hand-controlled clutch, kick-starter, variable jet carburettor; 28 gns.—15, Carlton Terrace, Finchley Rd., Childs Hill, N.W.2. (After 6.) [4309]

Ariel.

21b.p. Ariel, mag., good tyres, sound, smart appearance; £10.—3, Park St., Wellington, Salop. [X4052]

ARIEL, 2½h.p., spring forks, mag., good tyres, just been overhauled; £20.—19 Wood Lane, Shepherd's Bush. [4179]

32 1½h.p. Ariel Combination, new Dunlops, speedometer, 32 lamps, good order; £25.—4, Glebe Rd., Staines, Middlesex. [X4019]

ARIEL, 3½h.p., countershaft, solo £80, combination £106; early delivery.—Island agents, Witham Bros., Newport, Wight. [3688]

ARIEL, 3½h.p., 1912, fixed engine, decompressor, good order, not run since 1916; £22.—Cowap, Comberbach, Northwich, Cheshire. [X3654]

ARIEL, 3½h.p., tyres good, great bargain, £15; also a sidecar, upholstered leather, no wheel, 45/-.—Garage, 100, Risboro Lane, Cheriton Folkestone. [X4029]

RIDER TROWARD and Co., 31, High St., Hampstead.—New 3½h.p. 3-speed Ariel in stock, £80. Orders being booked for earliest delivery 5-6h.p. combination. [2257]

All letters relating to advertisements should quote the number at the end of each advertisement, and the date of the issue. A31

MOTOR CYCLES FOR SALE.

Ariel.

ARIEL, 8h.p., sidecar, 2-speed Enfield gear, handle starter, chain drive, speedometer, mechanical horn, tyres like new, spare cover, tools, spares, car lamp, pull-on seat, automatic lubrication; £80, bargain.—Holmes, 6, Colne Rd., Burnley, Lancs. [4064]

Arno.

ARNO, 2½h.p., absolutely new, mileage under 30, guaranteed perfect; bargain, £30.—Barnett, Horley, Surrey. [4226]

Auto-Wheels.

B.S.A. Auto-Wheel, complete; £8/10.—Clapham (Motors), King George St., Greenwich. [X4139a]

WALL Auto-Wheel, complete, good condition, runs well; £9.—Harris, Homestead, Birchington. [X4121]

WALL Auto-Wheel, nearly new, perfect running order; 11 gas, bargain.—Box L9,306, c/o The Motor Cycle. [4150]

GENUINE WALL Auto-Wheel, little used, complete; £10.—Murray's, 37a, Charles St., Hutton Garden, Holborn. [X4093]

IMPROVED WALL Auto-Wheel, perfect condition, little used, complete; £10, bargain.—Longworth, Haydon Lodge, Cheltenham. [X4014]

AUTO-WHEELS, Swift cycle, 26in. wheels, good condition, complete; £20.—Bright, Cascade Works, Litchfield Gardens, Willenhall Green. [4359]

AUTO-WHEELS, B.S.A. model, just overhauled by company, £12/12; also standard model, £8/10.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [4200]

Bat.

8 h.p. Bat-Jap, 1913, 2-speed, kick starter, spring frame, 3 lamps, coachbuilt sidecar, 2-seater, wind screen, lots of spares; £55.—Winn, Stamford, Settle. [X4013]

FOR Earliest Delivery B.S.A., place your order with us. Free insurance policy with every machine ordered before March 7th.—The Brook Motor and Engineering Co., Withington, Lancs. [X4272]

BAT-J.A.P., T.T., late model, 4.5h.p. twin, 2-speed countershaft gear box, new tyres and belt, round tank, lamp, horn, and tools; £28.—Walbro Motor Works, Saffron Walden, Essex. Phone: 45. [X4109]

Bradbury.

BRADBURY 2-speed Combination; bargain, £30.—Clapham (Motors), King George St., Greenwich. [X4139h]

1919 Bradbury's, cash or exchange.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [4280]

BRADBURY Combination, believed 1914, 4h.p., 2 speeds, Bosch, B.B., kick starter, etc., cane sidecar, side door, smart turn-out; 38 gas, nearest.—Delhi, Avon Rd., Devizes. [4107]

31h.p. Bradbury and Coachbuilt Sidecar, Brampton gear, lamps, and tools complete, all in good condition and good running order; £35.—Hays, Market Place, Abingdon, Berks. [X4021]

1915 6h.p. Bradbury Combination, 3-speed countershaft gear, kick start, lamp set, storm apron, good tyres, all accessories, perfect; £80.—45, Bow Common Lane, Bow, London. [4330]

Brown.

BROWN, 3½h.p., 3-speed, clutch, E.I.C. mag., in splendid condition; £30.—S., 5, Home St., Farnborough, Kent. [4350]

B.S.A.

B.S.A., 3-speed, 1919 models in stock.—Reys, 378, Euston Rd. [2972]

B.S.A. and Sidecar, very good order; only £35.—Box L9,308, c/o The Motor Cycle. [4148]

B.S.A.—Immediate delivery models K. and H. combinations.—J. C. Pickering, Shrewsbury. [4126]

1919 B.S.A. Chain-cum-belt Models in stock; 76 gas.—Rivett, 236, High Rd., Leytonstone. [3562]

NEW B.S.A.'s in stock; immediate delivery Model K.—Alexander, Agent, Wallasey Village. [1506]

NEW 4½h.p. B.S.A., in stock, Model K; £79/16.—Elice and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [4041]

1919 B.S.A. Models in stock; exchanges quoted.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [4276]

1912 B.S.A., 3½h.p., free engine, clutch, lamps, horn, good tyres; £26/10.—53, Devonport Rd., Shepherd's Bush, London, W.12. [4153]

B.S.A. Combination (1915), all-chain model, Millford sidecar, splendid condition; £85; seen by appointment.—B Bealoe, Staines. [4069]

B.S.A. 3½h.p. Coachbuilt Combination, 2 speeds, kick-starter, chain drive, perfect, sound; £48; exchange.—211, Garratt Lane, Wandsworth. [4299]

B.S.A., 1915, 4½h.p., 3-speed countershaft, all-chain drive, with sidecar, lamp, speedometer, condition is new; £60.—Whitmarsh, Castle Garage, Mere, Wilts. [X4009]

FOR Sale by private owner, 1917 B.S.A., 4½h.p., almost as new; can be seen by appointment; price £70.—Apply to A. Rossie, Wey Hill, Haslemere, Surrey. [4098]



Agents for

A.J.S.

(Sole London and District).

BRITISH EXCELSIOR

(Sole London and District).

TRIUMPH B.S.A.

HENDERSON A.B.C.

DOUGLAS

NEW IMPERIAL

CALTHORPE ENFIELD

P. & M. MATCHLESS

Write for delivery dates and for our exchange card if you wish your present mount to be taken in part exchange.

IMMEDIATE DELIVERY of the following NEW MACHINES:

4 h.p. W.O. DOUGLAS Combination,	
3 speeds, and kick-starter	£95 0
3½ h.p. W.O. P. & M. Combination, all-chain drive, 2 speeds, and kick-start	£102 0
2½ h.p. W.O. DOUGLAS, 2-speeds	£60 0
2½ h.p. CALTHORPE-J.A.P., 2 speeds ..	£52 0

SECOND-HAND.

1915 2½ h.p. Ladies' DOUGLAS, 3-speed, kick-starter; fully equipped	£52
1913 2½ h.p. DOUGLAS, 2 speed, clutch, and kick-starter	£38 0
1915 Baby LEVIS, single-speed	£25 0

SIDECAR CHASSIS, new, Model B, dual underslung, for 6h.p. and 8h.p. machines, complete with 650x65 rim (less tyre)

4-point attachment

Auxiliary Safety Arm, for converting 3-point attachment on sidecar to 4-point

(Postage, 6d.).

ACCESSORIES.

Special consignment of New Michelin Butted Inner Tubes, one size only, 26x2½

(Postage, 4d.).

CHAINS.

Present Prices.

Hans Renold, 1½ x 7/8, for Morgans . per ft.	5/9
" 1½ x 1, for A.J.S., Enfield, Indians, etc. . . per ft.	4/9
" 1½ x 1, for A.J.S., Enfield, Indians, etc. . . per ft.	4/9
" 1½ x 1, for A.J.S., Enfield, Indians, etc. . . per ft.	3/9
" 1½ x 1, for magneto drive " ..	3/2

(Postage extra.)

H. TAYLOR & CO., LTD.

Showrooms:

21a, Store Street, W.C.1.

Wholesale:

38, Alfred Place, W.C.1.

Garage:

Tottenham Court Road.

Phone: Museum 1240.

Telegrams: "Dynametro, Westcent, London."

MOTOR CYCLES FOR SALE.

B.S.A.

B.S.A., 1913, 3½h.p., kick starter, chain drive, all accessories, including speedometer, Dunlop F.I.I. tyres, in first-class condition; £40.—19, Dalton St., Wolverhampton. [4143]

1919 B.S.A., 4½h.p., 3 speeds, Model K, guaranteed not been 200 miles, as good as brand new; cash £75.—Walbro Motor Cycle Works, Saffron Walden, Essex. Phone: 45. [X4113]

B.S.A.—For the earliest possible delivery of 1919 models, advance specifications and prices, sole district agents, The Walsall Garage, Wolverhampton St., Walsall. Phone: 444. [X0126]

1915 B.S.A. 4h.p. Combination, 3 speeds, chain drive, kick-starter, Gloria cane sidecar, accessories, perfectly new condition all round; 64 gas.—Ripon Motor Co., Bonnage Bridge, Ripon. [4208]

1919 B.S.A., 4½h.p., 3 speeds, Model K, brand new; in stock, ready to ride away; first cheque secures, £79/16.—Walbro Motor Cycle Works, Saffron Walden, Essex. Phone: 45. [X4106]

RIDER TROWARD and Co., 31, High St., Hampstead.—New 4½h.p. B.S.A., chain-cum-belt, in stock, £79/16. Orders being booked for earliest delivery chain drive model, £81/18. [2259]

1919 B.S.A. New Combination, all-chain drive, 3-speed, with clutch, wind screen, horn, 3 lamps (acetylene); just cost £120, accept £110 for cash.—Male, Rosslyn, Coalway Rd., Wolverhampton. [X4131]

B.S.A., late 1916, with Millford sidecar, cantilever chassis, tyres perfect, Stepney road grip on rear, Binks carburettor, all electric lights, complete with accumulator, Lucas horn, tools, and sundries; £92/15.—Parker's, Bradshawgate, Bolton. [X4201]

B.S.A.—We have a model K, actually in stock, 76 gas, also 1916 K combination, price £89/10; and 1917 K combination, £95; both in exceptional condition and fully equipped; good prices allowed on exchanges.—Lamb's, 151, High St., Walthamstow, and 60, High Rd., Wood Green, N. [4196]

Calthorpe.

CALTHORPE—Delivery of 1919 models from stock.—J. C. Pickering, Shrewsbury. [4127]

RIDER TROWARD and Co., 31, High St., Hampstead. Immediate delivery new Calthorpes, all models. [3603]

3½h.p. Calthorpe Combination, 3-speed and clutch, 32 with lamps; £38.—113, Blair St., Poplar, London. [4251]

CALTHORPE Motor Cycles—All models in stock for immediate delivery.—P. J. Evans, 91, John Bright St., Birmingham. [0955]

CALTHORPE, 2½h.p., 2-stroke, 2 speeds, excellent condition; £21.—Rosslyn, Grove Park Rd., Maltby, E. Tan. [4211]

1915 Calthorpe, 2½h.p. J.A.P., 2-speed, speedometer, lamps, horn, spares, stored 3 years, as new; £32.—91, Burghley Rd., N.W.5. [4264]

1916 2½h.p. 2-stroke Calthorpe, condition as new, lamps, spare belt, full accessories; £25.—Litherland, 14, Leamington Av., Hoo St., Walthamstow, E.17. [4206]

CALTHORPE-J.A.P., 2½h.p., 2 speeds, believed 1915 model, sloping top tube, good tyres, lamp sets and horn, in very good condition; £35.—Walbro Motor Cycle Works, Saffron Walden, Essex. Phone: 45. [X4108]

Campion

1916 2½h.p. Campion, 2-stroke Villiers engine, like new, not run during 1918; £30; wanted, combination.—G. M. Pirie, Cranleigh. [4171]

1914 Campion, 4½h.p., single, Bosch mag., B. and B. semi automatic carburettor, 3-speed S.A. gear, with full controlled clutch, fitted with Dunlop extra heavy tyres, 2 lamps, spare belts, solid cast aluminium footboards, frame constructed with sidecar fittings, enamelling and plating perfect, not been used for over 2½ years; £45.—Seen 18, Park Av., Northend Rd., Golder's Green. [4141]

Chater-Lea.

3½h.p. Chater-Lea, in running order; a bargain.—32 Write Smith, 7, Coopers Cottages, Watford Rd., Harrow Rd., Sandbury. [4103]

CATHER-LEA, 5.6h.p. Twin Coachbuilt Combination, 2 speeds, wind screen; £35; exchange, £111. Garratt Lane, Wandsworth. [4300]

1916 8h.p. Chater-Lea Combination, magnificent outfit; £85.—Write, or call after 6 p.m., Kenard, 18, Myddleton Square, Clerkenwell. [4186]

Chater-Lea-Jap.

CATHER-LEA-J.A.P., 5.6h.p., 3-speed hub gear, and coachbuilt sidecar; this is a genuine bargain, £35.—Whitmarsh, Castle Garage, Mere, Wilts. [X4010]

Clyno.

CROW Bros., High St., Guildford, West Surrey agents for the 1919 Clyno. Order now to ensure early delivery. [1553]

1915 Clyno Combination, fitted with all electric lights, detachable wheels, spare wheel, 3-speed countershaft gear, kick start, and accessories, perfect; £85.—45, Bow Common Lane, Bow, London. [4331]

MOTOR CYCLES FOR SALE.

Clyno.

CLYNO 8h.p. Combination, combining best points of American and English big twins, just the outfit for the Island. Book orders for earliest delivery.—Witham Bros., Newport, I.W., Island agents. [3689]

CLYNO 1914-15 6h.p. Combination, 3-speed, counter-shaft kick start, Clyno sidecar, wind screen, interchangeable wheels, spare wheel, has not been used for last 3 years, everything in tip-top condition; price £85.—Wm. Hurlock, Jun., Ltd., 65, Deamark Hill, S.E.5. [4168]

Connaught.

CONNAUGHT.—Earliest delivery of all models.—J. C. Pickering, Shrewsbury. [4128]

Coventry Eagle.

COVENTRY Eagle, 1916, 2-stroke, 2-speed, not done 1,000 miles, lamps, horn; £40.—G. W. Wilson, High St., Warsop, Mansfield. [X4078]

Dayton.

DAYTON 2-stroke Lightweight, good condition, and good tyres, with lamps; £14/10.—Rose's Garage, Uxbridge. [4259]

De Dion.

DE DION, 3h.p., modern, low drop frame, overhauled, new spring forks, mag., tyres, saddle, fast; £12; after 7 p.m.—29, Russell Rd., St. Ann's, Tottenham. [4184]

Douglas.

GOOD Morning, Mr. G. Got any

X.Y.Z. Flat Twins in Stock?

NO, sir. I only stock the D horizontal opposed.

GOURLAY, The Great Douglas Agent, Fallowfield, Manchester. [4157]

2 1/2h.p. Douglas, in excellent condition; £30.—Chartres, 4 Suter Rd., Derby. [4039]

DOUGLAS, 2 1/2h.p., 2 speeds, clutch; £30, or exchange.—76, London St., Chertsey. [4097]

1911 Douglas, single speed, new tyres, fine order; £15—3, Park St., Wellington, Salop. [X4055]

DOUGLAS, 2 1/2h.p., less crankshaft and magneto; £7/10.—Johnson, 61, Osborne Rd., Acton. [4222]

DOUGLAS, 1915 (late), good condition; £48.—Lt. Wake, R.A.F., Bembridge, Isle of Wight. [4181]

1919 Douglases in stock; exchanges quoted.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [4277]

DOUGLAS, 2 1/2h.p., 2-speed, lamps, horn; bargain, £26.—152, Camberwell Grove, Camberwell, London. [4266]

DOUGLAS, 1916 1/2, 2-speed, 2 1/2h.p., T.T., accessories; £50.—Lt. Disney, Rossie, Kingston Hill, Surrey. [4329]

DOUGLAS in stock, 4h.p. combination, £95; War Office 2 1/2h.p. model, £60, new.—Moffat, Yeovil. Phone: 50. [4103]

1914 Douglas, 2 1/2h.p., 2-speed, perfect order, splendid mount; £38.—Bellwood, Victoria Rd., Scarborough. [4255]

DOUGLAS 1917 Combination, 4h.p., 3 speeds, elaborate outfit; £80.—51, Mapletorpe Rd., Thornton Heath, S.E. [4319]

GIBB, The Douglas Expert, Gloucester, is the man to get in touch with for best deliveries and advice. Phone: 852. [4749]

1914 2 1/2h.p. 2-speed Douglas, lamps, horn, in first-class order; £42.—S. B. Wood, Pedham Place, Swanley, Kent. [4379]

1916 Douglas, T.T., 2 1/2h.p., 2-speed, all-black model, in splendid condition; £50.—Pay, Wheatash Rd., Adlestone, Surrey. [4105]

DOUGLAS.—Book your orders now for delivery of 4h.p. and 2 1/2h.p. models; exchanges.—Parker's, Bradshawgate, Bolton. [X4195]

2 1/2h.p. Douglas, 2 speeds, accessories, very fast, condition as new; bargain, £40.—456, Whitehorse Rd., Thornton Heath, S.E. [4366]

DOUGLAS, 1914, 2 1/2h.p., T.T., long exhaust, almost as new, fast, perfect; any trial; £39.—A.E., 23, Market Place, Kingston, S.W. [4230]

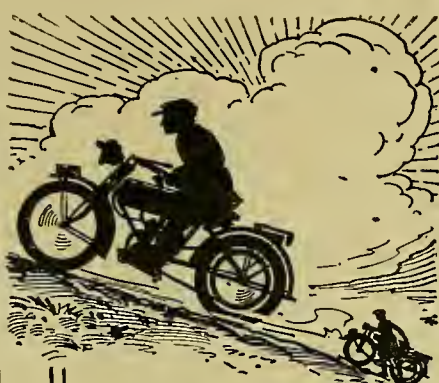
RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries Enfields, all models. [2261]

DOUGLAS, in good condition and order.—Cyclist, 4, Cornwall Parade, Church End, Finchley, N.3 (by tram from Golden's Green Tube). [4172]

1915 2 1/2h.p. Douglas, not been used for 2 years, in good order and condition; any trial; £45.—Gavdon, Brookhurst, Norwood, S.E.19. [4252]

1916 Enfield 6h.p. Combination, splendid condition, horn, lamps, complete; 84 gns.—Coventry Motor Mart, Ltd., 66, London Rd., Coventry. [X4165]

DOUGLAS, 1919, 2 1/2h.p., 2-speed, now on rail; also nearly new 1916 2-speed W.D. Model.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [4193]



"Up" EVERY time but—a lot depends on the mount selected for the task!

If it comes from my Depot, you'll "get there" every time because the only makes I stock are those of well-proved merit, and, in selection, helped by expert riders, you cannot but choose wisely. **EARLY Delivery of any of these well-known makes—**

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And in Light Cars, too, equal Reliability is guaranteed in a choice from the

PERRY, G.W.K., CALTHORPE, STANDARD.

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John Bright St., BIRMINGHAM.

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MOTOR CYCLES FOR SALE.

Douglas.

4h.p. Douglas Combination, 3 speeds, kick starter, new tyres, electric light set, splendid condition; best offer.—Roberts, Saw Mill Cottage, Eynsford. Phone: 26 Farningham. [4236]

1919 Douglas, 2 1/2h.p., 2-speed, complete with lamps and horn, just delivered from makers; unable to take delivery owing to illness; £67/10.—Chapman, 289, Liverpool Rd., Islington. [4162]

DOUGLAS, 4h.p., 1915 model, 2-speed speed model, lamps, horn, tools, been very little used, perfect order, condition as new; any trial; price £60.—Abergele Motor Co., Abergele, N.W. [4137]

DOUGLAS, 1914, 2-speed, clutch, kick starter, lamps, perfect condition, any examination, £42; with Watsonian light sidecar, £52; seen Sunday.—Evans, Woodcroft, Heronsgate, Rickmansworth. [4245]

DOUGLAS, 1919, 2 1/2h.p., just arrived from works; immediate delivery; now actually in stock; £60, first one secures.—Wilkins, Simpson and Co., 11, Hammersmith Rd., opposite Olympia, London. [4159]

1916 2 1/2h.p. Douglas, 3-speed clutch and kick start, stored 2 years, and guaranteed not ridden over 1,500 miles, head lamp and horn, whole in excellent condition; £55.—Cornwell, Borough Lane, Saffron Walden. [4213]

ELI CLARK can give you good advice also good deliveries of 1919 Douglas motors. He will help you if possible with spares. The man on the spot.—196, Cheltenham Rd., Bristol. Phone: 4169. Wires: Ignition, Bristol. (Please do not send sample spares.) [0966]

2 1/2h.p. Douglases, brand new, fitted 2-speed gears, 24 touring or semi-T.T. bars, footboards 15/6 extra, £60; two best lamp sets, horn, registration, writing number plates, £4/4 extra; enquiries invited, full specification by post; deliveries in rotation.—Robinson's Garage, Green St., Cambridge. [4333]

DOUGLAS, 4h.p. and 2 1/2h.p., brand new models, in stock. We are stockists and specialists of Douglas machines only, giving the finest service and the greatest choice of models in the South. Over nine years' experience as Douglas agents.—Thompson and Co., 408, Commercial Rd., Portsmouth. Phone: 7105. [2518]

4h.p. Douglases, brand new, fitted 3-speed gears, clutch, kick-start, with Douglas coachbuilt sidecar, £95; 3 lamp sets, horn, registration, writing number plates, £5/10 extra. Enquiries invited; full specification by post; deliveries in rotation.—Douglas Specialists, Robinson's Garage, Green St., Cambridge. Tel.: 388. T.A.: Bicycles. [4332]

Elswick.

ELSWICK Cycle Car, 2-seater, 1914, 8h.p., J.A.P., Bosch, 3-speed; sell or exchange combination.—S., 5, Home St., Frindsbury, Kent. [4351]

1915 Elswick, 2-stroke, countershaft 2-speed, lightweight, little used, Dunlops (tyre and belt new), accessories; worth £35, first £25 secures.—Laver, Ingle-nook, Birkby, Huddersfield. [4135]

Enfield.

ENFIELD, 1915, excellent condition, tyres new; seen any time.—245, Hammersmith Rd. [4243]

ENFIELD, all models, early deliveries.—J. A. Stacey, Sole Agent, 12, Ecclesall Rd., Sheffield. [X1543]

1913 Enfield Twin, single speed, chain drive, little used; £20.—3, Park St., Wellington, Salop. [X4054]

ENFIELD.—Earliest deliveries. Your name on our list ensures this.—Martin Mitchell, Ltd., Stafford. [X4071]

ENFIELD 1919 6h.p. Combination.—Lamb's, 151, High St., Walthamstow, and 50, Wood Green, N. [4197]

ENFIELD, 2 1/2h.p., grey model, twin, 2-speed, in first-class condition; £35.—Hammond's Garage, Crick-lade. [3912]

ENFIELD.—Book your order now for delivery of new models; exchanges.—Parker's, Bradshawgate, Bolton. [X4197]

1913-14 6h.p. Enfield, coachbuilt sidecar, not used since 1915, in splendid condition; £66.—R. Shephard, Crookhill, near Swanley. [4280]

ENFIELD Combinations, 1914, 1915, 1916; outfits here; early application to secure bargains.—Clapham (Motors), King George St., Greenwich, S.E.10. [X4140]

ENFIELD Combination, 1913, splendid condition; £55; seen evenings or Saturday.—73, First Avenue, Walthamstow, or 17, Woodland Villas, Chingford Rd. [4333]

1916 3h.p. Enfield, 2-speed, clutch, kick-start, lamps, horn, speedometer, fully equipped, in perfect condition, done about 1,500; £43.—36, First Avenue, Woodwich. [4270]

ENFIELD, 3h.p., Jone, 1915, T.T. 2-speed clutch model, overhauled by makers Jan., 1919, new lamps, new mechanical horn, Watford speedometer; £42.—Clements, 19, Stockwell Park Crescent, S.W.3. [X4158]

ENFIELD Combination, 6h.p., J.A.P., 1915, tyres good, speedometer, lamps, and generator, engine in first-class order; £58, or exchange for very fast high-powered combination and cash.—136, Station Rd., Adlestone, Surrey. [4275]

MOTOR CYCLES FOR SALE.

Excelsior.

ONE 6-h.p. American Excelsior and Montgomery sidecar, fitted up with Lucas lamps, everything as new; £95.—Attwood's Garage, Ecclestone, Staffs. [X4114]

1916 American Excelsior, fully equipped, an exceptionally fast bike, and as new; £85; too hot for owner; suit young officer wishing to "go"; exchange 1916-1917 Enfield or Sunbeam, small cash adjustment; genuine.—R. Gaydon, Upper Norwood, S.E.19. [X4253]

1916 American Excelsior Combination. 7.9-h.p., dynamo lighting model, kick starter, 3-speed gear, speedometer, electric horn and lamp, 2 spare chains, front wheel requires new cone, handlebar replating, otherwise machine in good order, fast and reliable, De Luxe sidecar, luggage grid, hood, screen, and side curtains; highest offer accepted.—Box 2,894, c/o The Motor Cycle. [X4169]

F.N.

F.N. Lightweight, with mag., less belt and chain; £9.—Hall, Hookman, Whetstone, N.20. [X085]

24 h.p. F.N., Grado gear, lamps, horn, good condition; £16.—152, Camberwell Grove, Camberwell. [X4229]

F.N., 1913, lightweight, 2 speeds, clutch, in good condition; £17.—A.B., 69, King Edward Rd., Rugby. [X4122]

F.N., 4-cyl., T.T., single speed, Bosch, sound; £17; exchange Ford parts; wanted, landaulet body.—Bottle, Hartley Wintney, Hants. [X078]

Grandex.

GRANDEX 1914 6-h.p. Twin Precision Combination, Enfield 2-speed, Bosch, kick start, Duplex lighting, accumulator, speedometer, horn, lamps, coachbuilt sidecar, Blumel wind screen, apron, C springs, outfit in excellent condition, mileage 5,000, privately owned; price £95; seen Richmond.—Box 19,322, c/o The Motor Cycle. [X4205]

Harley-Davidson.

HARLEY-DAVIDSON.—Orders booked for limited number sidecar models.—J. C. Pickering, Shrewsbury. [X4129]

RIDER TROWARD and Co., 31 High St., Hampstead.—Orders now being booked for earliest deliveries new Harley-Davidsons. [X2262]

HARLEY-DAVIDSON, 7.9-h.p., and coachbuilt sidecar, 1916 model, been stored for 2 years, in good condition; £80.—J. T. Jackson, Stalham, Norfolk. [X4080]

1917 Harley-Davidson, dynamo model, fitted with special constructed sidecar, everything new, speedometer, electric horn, unscratched, 60 m.p.h.; £130.—45, Bow Common Lane, Bow, E. [X071]

LATE 1915 Harley-Davidson, standard 3-speed mag. model, in good condition; £70, or would exchange with cash for 1916 electric model Harley-Davidson.—Blackburn, 160, Podgate Lane, Warrington. [X4153]

HARLEY-DAVIDSON, 1917, 7.9-h.p., mag. model, and H.D. sidecar, in exceptional condition, £120; also 1915 electric model, £67/10.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [X4199]

HARLEY-DAVIDSON Combination, late 1915, stored 2 years, with lamps, speedometer, Harley tool kit, powerful; £95, or nearest offer, or exchange lighter combination, 4-h.p. Douglas preferred; seen by appointment.—Wright, 8, Bushnell Rd., Balham. [X4097]

Hazlewood.

1916 Hazlewood-J.A.P. 6-h.p. Combination, countershaft 3-speed clutch, K.S. lamps, watch, mechanical horn; £78.—Wright, 113, Blair St., Poplar, London. [X4249]

Henderson.

HENDERSON, 1914, 2-speed, clutch, in perfect condition; £85.—Earl and Co., Athenæum Works, The Vane, Hampstead. [X4400]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new Hendersons. [X2264]

HENDERSON, 10-h.p., 4-cyl., and Canoelet sidecar, perfect running order; £95; smaller power combination part exchange.—Faulkner, Gloucester House, Park Lane, London, W.1. [X4347]

HENDERSON Combination, 4-cyl., 10-h.p., 2-speed, horn, lamps, front handle-bar muffs, spare tyre, speedometer, Phoenix torpedo sidecar, stored during war, as new, splendid condition; 80 gns.; no dealers or offers.—L9,283, c/o The Motor Cycle. [X4075]

Humber.

32 h.p. Humber, 2-speed, less mag.; £14.—3, Park St., 22 Wellington, Salop. [X4056]

HUMBER 2-h.p. Lightweight, suit beginner; £15; exchange.—211, Garratt Lane, Wandsworth. [X4288]

HUMBER 2½-h.p. twin crank case, timing half, wanted.—Chaplin, 85, Mawson Rd., Cambridge. [X4207]

HUMBER, 2½-h.p., Roe 2-speed, free engine, recently overhauled; £27.—Sheldon, Sunnymead, Wells. [X4216]

HUMBER Lightweight, left factory June, 1913, practically as new; 20 gns.—T., 43, Windmill St., Gravesend, Kent. [X4210]

HUMBER Lightweight, Bosch, B. and R. running order; £18.—Apply after six, 286, St. Margaret's Rd., E. Twickenham. [X4109]

THIS WEEK'S OFFER.

Latest model Triumph, 3 speed Countershaft, Price £87.

We are now booking orders for the following:—

A.J.S. B.S.A. ROYAL
ENFIELD. NEW IMPERIAL.
LÉVIS. MATCHLESS.
NORTON. ZENITH.
TRIUMPH and P. & M.

some of which we can deliver now from stock.

JULIAN, 84, Broad Street. READING.

'Phone: 1024.

Closed Wednesday I.



COMBINATIONS.

1918 6-h.p. ENFIELD Combination, electric lighting; only done 300 miles	£130
1916 6-h.p. ENFIELD Combination, lamp set, horn, speedometer; condition as new, only wants seeing	£110
1916 Powerplus INDIAN Combination, very good condition	£100
1915 INDIAN, 7-9 h.p., 3-speeds, kick-starter, beautiful Sidecar, electric lighting, speedometer; mileage 2,000	£95

SOLO MACHINES.

1917 3½ h.p. twin BROUGH, 3-speed, kick-starter, hand clutch, all accessories, splendid condition	£77
1915 2½ h.p. DOUGLAS, T.T., lamps, new tyres	£45
1917 2½ h.p. NEW IMPERIAL-J.A.P., lamps, horn. A beauty	£40

CARS.

1914 SINGER, 10 h.p., spare wheel, 5 lamps, good condition	£190
1914 STELLITE, 10 h.p., 5 lamps, spare wheel, speedometer, dicky seat. A little beauty	£230

WANTED.—First-class Combinations and Light Cars, for Cash.

J. SMITH & CO.,

16, HAMPSTEAD ROAD, LONDON, N.W.1.

MOTOR CYCLES FOR SALE.

Humber.

HUMBER 3-h.p. Twin, countershaft 2-speed gear; in splendid order; £30.—Britnell Bros., 45, High St., Fulham, S.W. [X375]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new 3½-h.p. and 6-h.p. flat twin Humber, [X2266]

HUMBER, 3-speed clutch model, and coachbuilt sidecar, excellent condition; room wanted; £40.—The Haven, 120, Sutherland Rd., West Croydon. [X4341]

32 h.p. Humber Combination, Aug., 1915, Sturmer 3-speed and clutch, kick-start, decompressor, drip feed, mileage under 1,000, Dunlop tyres nearly new, large head lamp, rear lamp, 2 spare valves, aluminium coach sidecar, wind screen and hood, a first-class and economical combination, equal to new; price £65.—Douglas, 68, Ivy Rd., Criklewood, N.W.2. [X308]

Indian.

INDIAN. Earliest delivery.—J. C. Pickering, Shrewsbury. [X4131]

INDIAN, 7.9-h.p., electrically equipped, new Swan de Luxe sidecar.—895, Fulham Rd., S.W. [X4244]

28 Gns.—Indian, 3½-h.p., 1913, single, Bosch, clutch, speedometer, little used.—Railway Garage, Staines, [X4401]

1916 5.6-h.p. Indian, 3-speed, torpedo sidecar, Klaxon horns, splendid condition, last; £65.—17, Lees Rd., Guildford. [X4235]

1912 7.9-h.p. T.T. Indian (red), variable gear, needs some overhauling; £25, or nearest.—Box 2,893, c/o The Motor Cycle. [X4154]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new Indians. [X2263]

INDIAN 1914 Combination, spring frame, 2 speeds, electric lighting, been stored; £65, bargain.—51, Maplethorpe Rd., Thornton Heath, S.E. [X4318]

1917 Indian (December), 5.6-h.p., perfect condition, recently overhauled, all accessories; trial allowed; price £60, or near offer.—Box 19,310, c/o The Motor Cycle. [X4155]

INDIAN Combination, red, 1916 (Nov.), 5.6-h.p., 3-speed, clutch, electric lamps, mechanical horn, not done 600, perfect; sell or exchange for solo.—32, High St., Reigate. [X4221]

1916 5.6-h.p. Indian, 3-speed, clutch, kick start, lamps, etc., T.T. or touring bars, little used, perfect condition; £68.—Empson, Cockayne Hatley, Pottton, Beds. [X4336]

INDIAN Combination, 1915, 7.9-h.p., clutch, fitted with new hood and screen, head lamps, horn, fine condition and smart; private owner; £59.—255, Francis Rd., Leyton, E.10. [X4294]

INDIAN, 7.9-h.p., 1913, spring frame, 2-speed, clutch, electric head and tail lamps, and Indian sidecar with new tyre, other tyres in good condition; £50.—Wells and Son, Dovercourt, Essex. [X3526]

5-h.p. Indian, 1916, as new, complete with new 1919 sidecar, Indian red, just delivered.—The above combination can be seen by appointment at Anderson, 19, Essex Rd., Enfield, Middlesex. [X4101]

INDIAN Coachbuilt Combination, 7.9-h.p., 1914, 2-speed, clutch, kick start, electric light and horn, speedometer, in excellent condition and fine running order; any trial; £70.—Box 2,888, c/o The Motor Cycle. [X4103]

Ivy.

44 h.p. Ivy-Precision, T.T. model de Luxe, sporting sidecar, fast, powerful machine; exceptional bargain, £35.—29, Montford Place, Kennington, S.E.11. [X4146]

Ixon.

IXION 2-stroke, good condition, footboards, P. and H. lamp set; £24.—Stace, 3, Holmesdale Terrace, Folkestone. [X4289]

James.

JAMES.—New model 2-stroke in stock; earliest delivery others.—Pickering, Shrewsbury. [X4150]

JAMES, 2½-h.p., 2-stroke, 2-speed, late 1918, as new, Lucas lighting set, horn, no tools; 40 gns. net; approval.—Thacker, Wynnstay Rd., Old Colwyn. [X4060]

RIDER TROWARD and Co., 31, High St., Hampstead.—James machines. Delivery this month new 5.6-h.p. twin combination, £126; 4½-h.p. solo, 85 gns.; combination, 104 gns.; delivery February, 3½-h.p. twin, 85 gns.; March, 2½-h.p. 2-stroke. Orders accepted in strict rotation. [X2267]

J.A.P.

J.A.P., 3½-h.p., low built, fast, excellent order; £21.—Bellwood, Victoria Rd., Scarborough. [X4257]

J.A.P. with Swan sidecar, 4-h.p., 3-speed, good running order.—Fabian, 12, Waterloo Place, S.W.1. [X4055]

2½-h.p. J.A.P., Bosch watertight mag., lamps, etc., good condition; £14/10, bargain.—436, Whitehorse Rd., Thornton Heath, S.E. [X4368]

J.H.

J.H. 6-h.p. Combination, in first-class condition, complete with all lamps and tools; £85.—Apply, Turner, 97a, Carysfort Rd., Church St., Clissold Park, London, N.10. [X4327]

MOTOR CYCLES FOR SALE.

Kerry

3 1/2 h.p. Kerr-Abingdon, R. and B., Bosch, good condition; £18.—4, Glebe Rd., Staines, Middlesex. [X4020]

King Dick

KING Dick (1911), 3 1/2 h.p., 2 speeds, mag., engine, etc., in good order, slight defect in frame; £16, or offer.—Beech's Garage, Liskeard. [4104]

Levis.

LEVIS, 2 1/2 h.p., 2-stroke, perfect; £26; exchange.—211, Garratt Lane, Wandsworth. [4296]

1919 Levis; cash or exchange.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [4284]

LEVIS.—Order now for earliest deliveries of 1919 models.—Longman, Fisherton St., Salisbury. [2358]

LEVIS.—Earliest deliveries. Your name on our list ensures this.—Martin Mitchell, Ltd., Stafford. [X4072]

LEVIS, 1914-15, 2-speed, little used, and in splendid condition; seen.—474, Middlewood Rd., Sheffield. [4049]

LEVIS Popular, 1915, acetylene lamps, mechanical horn, speedometer, tools, etc.; £26.—Dr. Snell, Christchurch, Hants. [4067]

LEVIS, 2 1/2 h.p., new, Lucas lamps and horn, Brooks special saddle, can of petrol; what offers? appointment.—36, Balfour Rd., Bromley, Kent. [X4145]

LEVIS Popular, single speed, 2-stroke; £38.—Isle of Wight agents, William Bros., Newport, Wight. Catalogues on request. Early deliveries. [3687]

LEVIS, 2 1/2 h.p., gear 4 1/2-1, T.T. bars, red tank, lamps, horn, tools, sporting machine, fine condition, runs splendidly; seen any time until Sunday; 25 gns.—108, Church St., Edmonton. [4262]

RIDER TROWARD and Co., 31, High St., Hampstead.—Levis. Delivery this month, Model E, 2-speed, clutch, £47/10; Popular, £38. Orders being booked in strict rotation. [4268]

LEVIS.—For the earliest possible delivery of 1919 models, advance specifications of all models, sole district agents, The Walsall Garage, Wolverhampton St., Walsall. Phone: 444. [X1027]

2 1/2 h.p. Levis, 2-speed, countershaft gear box, developed 1915 model, nearly new studded Dunlops, lamp sets, horn, and tools, in very good condition; £35.—Walbro Motor Cycle Works, Saffron Walden, Essex. Phone: 45. [X4107]

L.M.C.

L.M.C., 3 1/2 h.p., Bosch, Senspray, engine just overhauled; seen by appointment; £25, or nearest offer.—Gregory, 70, Chalk Farm Rd., N.W.1. [4086]

Martin.

MARTIN J.A.P., 8-10 h.p., o.h.v., 1914, T.T. handlebars, Klaxon, fixed gear, tip-top condition; £60.—Baines Bros., Gainsborough. [X3849]

Matchless

MATCHLESS.—Early delivery 1919 model combination.—J. C. Pickering, Shrewsbury. [4120]

MATCHLESS, early deliveries.—Sole Agent, J. A. Stacey, 12, Ecclesall Rd., Sheffield. [X1544]

MATCHLESS, 1914, 6 h.p., and coachbuilt sidecar, excellent condition.—245, Hammersmith Rd. [4242]

6 h.p. Matchless-Jap, 3-speed, in new condition; will exchange for 2 1/2 h.p., or sell £56.—125, Canal Rd., Mile End, E. [4174]

MATCHLESS.—Book your order now for delivery of new 8 h.p. models; exchanges.—Parker's, Bradshawgate, Bolton. [X4196]

CROW Bros., High St., Guildford, West Surrey agents for the 1919 Matchless. Order now to ensure early delivery. [1552]

NEW Matchless Combination, with spare wheel, in stock; £140.—Eice and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0491]

RIDER TROWARD and Co., 31, High St., Hampstead.—Matchless. Earliest delivery. Victory model combination £140. [42269]

MATCHLESS 2 1/2 h.p. J.A.P., Bosch mag., 2-speed; £18, or exchange for combination, cash adjustment.—12, Westholme, Northumberland Heath, Epsom. [4219]

MATCHLESS, 8 h.p. twin J.A.P. engine, new tyres, good order; £30, or near offer; ready to ride away.—Mills, The Firs, Spaniards Rd., Hampstead Heath. [4227]

MATCHLESS Victory Model Combination actually in stock, with spare wheel and tyre; £140; seen by appointment.—J. Tassell, 1a, Bloomfield Rd., Plumstead, S.E.18. [1606]

MATCHLESS, 1919, 8 h.p. Victory Model, with spare wheel, horn, etc., only ridden 50 miles; cost £142, sell £130, or cheaper machine and cash.—29, St. Leonard's St., Bromley-by-Bow. [4240]

MATCHLESS.—Special contracting agents for post war Matchless models; earliest deliveries; exchanges and easy payments arranged.—Maudes, 100, 61, Portland St., London, W.1. [9920]

MATCHLESS Combination, M.A.G. engine, 3-speed, kick start, speedometer, grid, petrol carrier, all accessories, perfect condition; £120, or exchange to value.—Melrose, 1, Kenlor Rd., Tooting. [4234]

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700 x 80 heavy ribbed	55/-	71/3
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Bikes, Goodyear, Firestone, etc.					
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MOTOR CYCLES FOR SALE.

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4 1/2 h.p. Mead-Precision, single-cyl., air-cooled, 89 v engine, kick start, ratio 4 1/2 to 7 1/2, speedometer, 5 lamps, Bramble coachbuilt sidecar, wind screen, hood, storm apron and luggage carrier, outfit in good condition, mileage 3,290; what offers?—Box L9,286, c/o The Motor Cycle. [4090]

Metro.

METRO-TYLER.—Earliest delivery of this sporting lightweight. Free insurance policy at Lloyds 70, all machines ordered before March 7th.—The Brock Motor and Engineering Co., Withington, Lancs. [X2728]

RIDER TROWARD and Co., 31, 40h, and 78, High St., Hampstead, sole agents for the Metro-Tyler 2 1/2 h.p. 2-stroke for London, Middlesex, Essex, Hertfordshire, Surrey, Sussex, Kent, and portions of Berkshire and Buckinghamshire; immediate delivery. 2-speed model £52, single-speed £46; demonstration model in stock. Trade enquiries invited and district agencies arranged. [3601]

Minerva

3 1/2 h.p. Minerva, h.t. magneto, B.B. carburettor, 32 new tyres, accessories, ride away; £12. Bedford, 10a, Sunninghill Rd., Streatham, S.W.16. [4214]

5 h.p. Minerva Twin and Sidecar, m.o.i.v., spring forks, adjustable pulley, Amie, Rothardt mag., 5m. tyres, good order throughout; £16; seen any time.—179, Selhurst Rd., South Norwood. [X4076]

3 1/2 h.p. Minerva, low, Bosch waterproof, 26 wheels, 32 footboards, carrier, B. and B., variable jet, Brooks saddle, acetylene head and rear, separate generator, foot brake, excellent condition; bargain, £16.—E. Brew, 20, Blackfriars Rd., S.E. [4557]

Moto-Reve

MOTO-REVE Twin, grey, in splendid condition; price £20.—E. Bros, 20, Blackfriars Rd., London, S.E.1. [4556]

Motosacoché.

MOTOSACOCHE, 2 1/2 h.p., in good condition, nearly new belt, plating and tyres good; £15, or nearest offer; privately owned.—Hartwell, 47, Regent Grove, Leamington, Warwickshire. [X3981]

MOTOSACOCHE, 3 1/2 h.p. twin M.A.G., 2 speeds and kick-starter, lamps, fan, machine, in very good condition, enamel almost as new; £45, or exchange for slower machine and cash, Douglas or Lea-Francis preferred.—47, Hamilton Rd., Reading. [4578]

New Hudson.

NEW Hudson, 4 h.p., practically new, in first-class condition; what offers?—Sheldon, Sunnymead, Wells. [4217]

NEW Hudson, 2 1/2 h.p. J.A.P., 3-speed, clutch, fully equipped, and just overhauled; price £37/10.—Abercrombie Motor Co., Abercrombie. [4139]

4 1/2 h.p. New Hudson, 1914, coachbuilt sidecar, counter-4 shaft, 3 speeds, clutch, handle starter, Bosch mag.; £50, or near offer.—Akani, 22, Chesholm Rd., Stone Newington, London. [4099]

NEW Hudson Combination, 4 h.p. J.A.P., 3-speed Armstrong hub, P. and H. lamps, horn, tools, perfect condition; £35.—Williams, Catherine Villa, Closerath Rd., Farnborough, Hants. [4074]

NEW HUDSON 1915 4 h.p. Combination, 5-speed countershaft, h.c. clutch, lamps, horn, new speed belt, stored since 1916, practically unused; £70.—54, Liverpool Rd., Newcastle, Staffs. [X4125]

New Imperial.

CROW Bros., Guildford.—New Imperial, all models, new and overhauled second-hands stocked. [9778]

RIDER TROWARD and Co., 31, High St., Hampstead.—Immediate delivery New Imperials [3604]

NEW Imperial.—All models for immediate delivery.—J. A. Stacey, Sole Agent, 12, Ecclesall Rd., Sheffield. [X1545]

1919 New Imperials in stock; exchanges quoted.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [4278]

NEW Imperials, sole London agents.—2 1/2 h.p. 2-speed 1919 models in stock; trade supplied.—Reys, Foston Rd. [2973]

NEW Imperial J.A.P., 2-speed, late 1914, just overhauled; £25; ride away.—60, Doggett Rd., Catford. [4335]

1914 New Imperial J.A.P., 2 1/2 h.p., 2-speed, excellent order; £32/10.—Bellwood, Victoria Rd., Scarborough. [4254]

1918 8 h.p. New Imperial Combination, as new; £100; exchanges; two lightweights; offers; stamp.—Vicars, Twyford, Buckingham. [4146]

NEW Imperial Combination, 8 h.p.; immediate delivery; 109 gns.—Exeter Motor Cycle and Light Car Co., Ltd., Bath Rd., Exeter. [10958]

NEW Imperial Motor Cycle.—2-speed, standard, and lady's models in stock for immediate delivery.—P. J. Evans, 91, John Bright St., Birmingham [0856]

NEW Imperial, 1916, 2 1/2 h.p. J.A.P., 2-speed, only ridden few miles, complete with lamps, etc.; 32 gns.—Smith, 16, Haverstock Hill, opposite Chalk Farm Tube Station [4344]

MOTOR CYCLES FOR SALE.

New Imperial.

NEW IMPERIAL J.A.P., 2½ h.p., 1916, 2-speed, clutch, kick-start, Lucas lamps and horn, not run 500 miles, all as new; £40.—Cole, 225, Peckham Rye, S.E.15. [4209]

Norton.

NORTON 1919 Models and prices:

MODEL No. 1, 4 h.p., 3-speed, chain drive; £87.

MODEL No. 7, Brooklands special; £80.

MODEL No. 8, Brooklands road special; £73.

MODEL No. 9, Tourist Trophy; £63.

MODEL No. 16, countershaft, all-chain; £85.

DELIVERIES Commence February. Book your machine now.—Batchelor, Clarence St., Kingston. [3167]

1919 Nortons; cash or exchange.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [4261]

NORTON T.T., 1915, lamps, grand machine, little used; £45.—51, Maplethorpe Rd., Thornton Heath, S.E. [4320]

NORTON.—Book your order now for the earliest possible delivery; exchanges.—Parker's, Bradshawgate, Bolton. [X4200]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery new Nortons. [2266]

NORTONS.—We are now booking orders for the latest model Nortons, solo and sidecar outfits; £5 deposit; deliveries in strictest rotation.—Mandess, 100, Gt. Portland St., London, W.1. [1442]

NORTON, late 1915, 3½ h.p., T.T., Brooklands road special, long exhaust, variable pulley, accessories, very fast; any trial; bargain, £54, or with cash for twin combination.—E., c/o Leach Bros., Oilmen, Market Place, Kingston. [4271]

NORTON, 1916, 3½ h.p., 3-speed countershaft Sturmer-Archer gear, C.A.V. mag., B. and B. carburettor, T.T. bars, Stewart speedometer, Dunlop tyres as new, in excellent condition, only done 1,300 miles; £75.—Jackson, Easby Rd., Bradford. [4161]

N.S.U.

3½ h.p. N.S.U., in running order; £13.—Stephens, 9, Pennywalk Rd., Llanelli. [X4118]

N.U.T.

N.U.T. 1914 4 h.p. Twin 3-speed Combination; £46.—15, Hamilton Rd., Ealing, W.5. [4212]

3½ h.p. N.U.T. and Sidecar, lamps and horn, nearly new; £105.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0551]

RIDER TROWARD and Co., 31, 40b, and 78, High St., Hampstead, sole agents for the N.U.T. 3½ h.p. twin 3-speed, dynamo lighting for the whole of London, Middlesex, Essex, Hertfordshire, Surrey, Sussex, Kent, and portions of Buckinghamshire and Berkshire. Orders now being booked for earliest delivery, and district agencies arranged. [3602]

O.K.

RIDER TROWARD and Co., 31, High St., Hampstead.—O.K. Orders being booked for earliest delivery. [2271]

O.K.-J.A.P., 2-speed, 2½ h.p., 1916, in good condition, used very little; £32.—D. Burnett, Rossington Bridge, Doncaster. [X4172]

O.K. Juniors must be booked now if you really want to get there and back every time.—Young's, The Parade, Kilburn, N.W.6. [0967]

O.K. Mark IV. Junior, J.A.P. 2½ h.p., 2-speed countershaft, good order, nice appearance, lamps, horn; £26.—38, Balfour Rd., Bromley, Kent. [X4144]

O.K., 1917, 2½ h.p., 4-stroke, 2-speed, condition as new, only ridden a few miles, complete with lamps, etc.; 51 gns.—Smith, 16, Haverstock Hill, opposite Chalk Farm Tube Station. [4343]

Omega.

OMEGA, 1915, 3 h.p., lamps and horn, in good condition; £25.—33, Highfield Rd., Luton. [X3996]

P. and M.

P. and M., 1919 R.A.F. Model, in stock; price £78.—Martin Mitchell, Ltd., Stafford. [X4073]

BRAND New P. and M. 3½ h.p. R.A.F. Combination; £102; delivery this month.—Walbro Motor Cycle Works, Saffron Walden, Essex. Phone: 45. [X4104]

P. and M., 1919, 3½ h.p., 2-speed model, and sidecar, just come into stock; £102.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [4194]

Peugeot.

PEUGEOT 6 h.p., Grade gear, good condition; £18/10.—Johnson, 61, Osborne Rd., Acton. [4223]

3½ h.p. Twin Peugeot 2-speed Combination, handle start, countershaft, lamps; £24.—113, Blair St., Poplar, London. [4250]

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JAMES 5-6 h.p. Combination	£126 0
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2½ h.p. NEW IMPERIAL	£60 8
3 h.p. NEW IMPERIAL Comb.	£126 0
8 h.p. MATCHLESS, Victory Models	£140 0
3½ h.p. ROVERS, 3-sp. models	£85 0
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5-6 h.p. ARIEL Combination in Stock	—

Expected very shortly:

A.C.C.	£70 0
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Ditto, with spare wheel	£130 0
6 h.p. ENFIELD Combination	120 gns.
8 h.p. ENFIELD Combination	122 gns.
6 h.p. Ditto, with dynamo lighting	140 gns.; 8 h.p. 142 gns.

Please Note.—We have been appointed North London and North-West London Agents for A.B.C. and BLACKBURN Motor Cycles.

THE LEADING MIDLAND HOUSE

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are now coming through — but you will be well advised to place your order at once. We hold agencies for the following machines, and can give earliest possible delivery.

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AMERICAN EXCELSIOR.

The Premier Motor Co.,
ASTON ROAD, BIRMINGHAM.

MOTOR CYCLES FOR SALE.

Precision.

1913 4½ h.p. Precision Motor Cycle, coachbuilt sidecar Bosch waterproof magneto, B. and B. carburettor; trial given; £35.—Bedford, 10a, Sunnyhill Rd., Streatham, S.W.16. [4215]

1915 4 h.p. Twin Precision Combination, 3-speed, kick-start, Hinks carburettor, 2 spare tyres, 1 tube, 2 new valves, etc.; a very nice and fast lot.—59, Stockwell Park Rd., Stockwell, S.W. [4409]

Premier.

PREMIER, 3½ h.p., 2-speed, free engine, coach sidecar; £27/10.—29, St. Leonard's St., Bromley-by-Bow. [4238]

3½ h.p. Premier, 1914, 3-speed Armstrongs, clutch, K.S., mechanically perfect; £35. Perkins, Chemist, Ystalyfera. [X4074]

PREMIER, 1914, 3½ h.p., Philipson pulley, accessories, tyres good; £31; seen after 6.—Noble, Pen-dale, Clapham Rd., Bedford. [X3848]

PREMIER Combination, 1913-14, very little used, countershaft, coachbuilt sidecar and pillion seat, new tyres, tools, and electric lighting; £70; excellent running; seen week-ends by appointment.—37, Eddystone Rd., Brockley, S.E.4. [4114]

Quadrant.

1915 4½ h.p. Quadrant, Sturmer-Archer 3-speed and clutch, splendid condition; £32.—7, Victoria St., Rugby. [X4155]

Radco

RADCO, 2½ h.p., 2-stroke, lamps, accessories, grand goer; £24.—29, St. Leonard's St., Bromley-by-Bow. [4237]

Rex

1919 Rex; cash or exchange.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [4283]

REX Twin and Sidecar, good order and condition; £23.—Hall, Hockman, Whetstone, N.20. [4084]

REX, o.h.v., splendid climber, only wants slight overhaul; £5.—Rex, 4, Pearl Lane, Chester. [X4147]

REX, 3½ h.p., brass head lamp, Amac carburettor, R. watright mag., 28 in. wheels, forfeited licence, £20; single coil trembler, 20/.—Pawnbroker, 23, West St., Conleiton. [X3851]

REX de Luxe 6 h.p. Combination, 2-speed and clutch, coachbuilt sidecar, wind screen and apron, lamps, horn, tools, etc. 850/85 tyres fitted; any expert examination or trial; £52, or offer; good lightweight part; seen any time.—C.S., 497, Old Ford Rd., Bow, E.3. [4312]

Rover.

ROVER, 1914, 3½ h.p., 3 speeds, lamps; £45; after 2.—49, St. Augustine's Av., South Croydon. [4233]

ROVER, 1913, 3½ h.p., clutch model, good running order, recently overhauled; £25.—Todd, Water-bench, Cambs. [X4026]

ROVER Brand New Sidecar, with brake, in stock; £32/10.—151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [4198]

1918 Rover, 3½ h.p., 3-speed countershaft, kick-start, as new, done under 100 miles; best offer.—12, Eaton Rd., Birkenhead. [X4120]

ROVER 1914 3½ h.p. and C.B. sidecar, stored during war, 3-speed, kick starter, lamps, horn; 60 gns.; reasonable trial.—Montague, 168, Wandsworth Rd., Vauxhall, S.W. [X4171]

ROVER Combination, absolutely new, guaranteed not ridden 50 miles 3 speeds, countershaft, clutch, kick-start, lamps, etc.; 95 gns.—Robertson, 4, Great Western Rd., Paddington, W.9. [4342]

ROVER 3½ h.p. Coach Combination, 3-speed, late 1914, little used during the war, tyres good, 2 new belts, 3 inner tubes, paint good, the whole in splendid condition, just overhauled; £52, or nearest.—Martin, 4, Bear St., Yeovil. [X4162]

ROVER Combination, 1914, 3-speed, clutch, Rover coachbuilt sidecar, carefully stored during war, splendid mechanical order, enamel and plating as new, tyres and belt very good, lamps, generator, spare valve, etc., wants nothing spent on it; £60.—6, Dinsmore Rd., Balham, London, S.W.12. [4311]

Royal Ruby.

ROYAL Ruby.—Earliest delivery all models.—J. C. Pickering, Shrewsbury. [4121]

1919 Royal Ruby; cash or exchange.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [4282]

ROYAL Ruby, 2-stroke, in perfect condition; £30.—101, Shaftesbury Rd., Ravenscourt Park. [4247]

ROYAL Ruby, 2-stroke; order now for earliest deliveries of 1919 models.—Longman, Fisherton St., Salisbury. [2359]

ROYAL Ruby.—Orders now being booked for earliest delivery; 2-strokes £40, 8 h.p. combination £135.—Rider Troward and Co., 31, High St., Hampstead. [2902]

1917 (Oct.) Royal Ruby, 2½ h.p. J.A.P., 2-speed, hand clutch, hand start, perfect, under 200 miles; £40 cash.—102, Laburnum Rd., Reddish Lane, Gorton, Manchester. [X4149]

MOTOR CYCLES FOR SALE.

Rudge.

RUDGE, 3½ h.p., clutch, new belt and tube; £22/10. —31, Shursted St., Keanington. [4246]

RUDGE Multi, 3½ h.p., 1915, sporting model, splendid condition; 40 gns.—48, Ravenslea Rd., Wandsworth Common, S.W.12. [4295]

RUDGE Multi, I.O.M., good condition, original tyres, speedometer, horn, 50 m.p.h. guaranteed; £50.—143, Croxsted Rd., Dulwich. [4116]

RIDER TROWARD and Co., 31, High St., Hampstead.—Rudge Multi, I.O.M. models only. Orders being booked for earliest delivery [4272]

RUDGE Multi, 3½ h.p., 1914, reliable mount, lamps, horn, speedometer, handle-car clutch, spare belts, tube.—Andrews, Oliver Cottage, Ecclesfield. [X4064]

RUDGE Multi, 3½ h.p., Herald sidecar, and all accessories, both in good condition, engine as new; £30.—Shepherd, Croxstead, Farnham, Surrey. [4220]

T.T. I.O.M. Rudge Multi, disc wheels, lamps, mechanical horn, long exhaust, perfect condition, privately owned; first cheque 70 gns.—Box 2,875, c/o The Motor Cycle. [X3987]

1915 4 h.p. Rudge Multi Combination, clutch model, in perfect condition, tyres, belt, etc., nearly new; price £65.—Scholes, Burnside, Lightwood Rd., Buxton. [X4128]

RUDGE Multi, 1915, I.O.M., new front tyre, back tyre as new, condition perfect; reason for selling, buying new machine; £58.—Lt. Barton, 7, S.D.S., Feltwell, Norfolk. [4348]

RUDGE, believed 1914, 3½ h.p., clutch, T.T. handlebars, condition A1; only wants seeing, can be seen any time; £30.—Cedar Stables, Richmond Rd., New Barnet. [X3843]

1914 Rudge Multi Combination, Montgomery sidecar, overhauled by ourselves, new rear tyre and belt, speedometer, lamps complete; 54 gns.—Coventry Motor Mart, Ltd., 86, London Rd., Coventry. [X4166]

1914 Rudge 5-h.p. Combination, 3-speed Sturmey-Archer gear, clutch model; £60, or exchange for Douglas solo with cash; seen Saturday afternoon or Sunday by appointment.—11, Claremont Rd., Forest Gate, E.7. [4166]

Scott.

SCOTT, 2-stroke, 2-speeds; a bargain, £30.—Reilly, 215, Overgate, Dundee. [3944]

Singer.

2½ h.p. Singer, 1913, 2-speed, clutch, kick-start, excellent condition; £25.—87, Skipton Rd., Colne. [X4145]

SINGER, 3½ h.p., 1915, 3-speed Sturmey-Archer, excellent condition, not used 500 miles; complete; £47.—James, 27, King St., Carmarthen. [X3177]

Sparkbrook.

SPARKBROOK-VILLIERS, 2½ h.p., 2-speed, Bosch, Sensapay, auxiliary tank fitted; £27.—Hunt, Redcot, Manor Way, Blackheath, S.E. [4142]

SPARKBROOK, 2½ h.p. Villiers, 1917, lamp, horn, tools, several extras, perfect, and unsundered, only done 800 miles; £36.—Abergele Motor Co., Abergele. [4138]

Sun.

SUN-VILLIERS, 2½ h.p., 2-stroke, perfect; £25; exchange.—211, Garratt Lane, Wandsworth. [4297]

SUN-VILLIERS, 1914, 2-stroke, single speed, little used; £25; seen by appointment only.—8, 67, Southwark Bridge Rd., S.E.1. [X4015]

SUN-V.T.S., 1916, 2½ h.p., single speed, 2-stroke, Amac, belt, and tyres in fine condition, in perfect running condition; £30, or nearest; seen any time.—Saville, c/o Wilde, 40, Regent Rd., Morecambe, Lancs. [X4153]

Sunbeam.

1919 Sunbeams in stock; exchanges quoted.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [4279]

SUNBEAM.—Early delivery of new models; exchanges; enquiries invited.—Parker's, Bradshawgate, Bolton. [X4199]

SUNBEAM, 3½ h.p., 1915, perfect condition, large lamp set and rear; first cheque 60 gns., bargain.—Reynolds, Waterbeach, Cambs. [4132]

1916 3½ h.p. Sunbeam, disc wheels, lamps, horn, speedometer, T.T. bars; £85.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0552]

SUNBEAM, 1914, 2½ h.p., 2-speed, kick starter, hand controlled clutch; £35, or exchange with cash for first-class Triumph or Norton.—Hargrave, jun., Wath, Ripon. [X4024]

6 h.p. Sunbeam Combination, Gloria spring wheel sidecar, luggage grid, petrol carrier, Lucas lamps, horn; will give trial; £90; lightweight part.—Morris, Germain St., Farnworth, Bolton. [X4075]

1916 3½ h.p. Sunbeam Combination, complete with 3 lamps, horn, grid, tools, etc., the whole outfit in perfect condition; can be seen and tried by appointment; price £100.—R.H.C., 58, Lowndes St., S.W. [4369]

SUNBEAM, 3½ h.p., Sep., 1914, only in use 2½ years, just been thoroughly overhauled, Gloria sidecar, reupholstered and repainted, lamp, horn, tools, spares.—Sam Watson, Rosemount, Knock Rd., Belfast. [X4081]

DELIVERY OF NEW MACHINES

We have the following delivery dates open:

A.B.C., 3 h.p.	£79	0	May.
A.J.B., 6 h.p. twin Combination	135	gns.	Mar.
ARIEL, 3½ h.p., 3-speed	£80	0	Feb.
ALLON, 2½ h.p., 2-speed, clutch	£55	0	"
2½ h.p., 2-sp. clutch, with K.S.	£65	0	"
B.S.A., 4½ h.p. c. & h.	76	gns.	Early.
4½ h.p., attached	78	gns.	"
BLACKBURN, 4 h.p.	£80	0	Mar.
3 h.p.	£100	0	May.
CONNAUGHT MINIATURE, single	£41	3	Early.
" Standard, single	£42	0	"
2-speed	£49	15	"
COVENTRY EAGLE, 2-stroke, 2-sp.	£54	12	Stock.
DOUGLAS 4 h.p. Combination	£95	0	"
2½ h.p.	£60	0	"
ENFIELD 5 h.p. Combination	110	gns.	Feb.
" 8 h.p. Combination	112	gns.	"
" 3 h.p., twin	£69	6	"
2½ h.p., 2-stroke	£52	10	"
JAMES, 4½ h.p.	£89	5	Stock.
6 h.p., twin Combination	£126	0	"
MATCHLESS 3 h.p. Combination	£140	0	Early.
LEVIS, 2½ h.p., single	£30	0	Mar.
NEW IMPERIAL, 2½ h.p., 2-speed	£58	0	Feb.
" 2½ h.p., 2-sp., K.S.	£58	10	"
" clutch	£58	6	"
8 h.p. Comb.	£126	0	"
NORTON, 3½ h.p.	£87	0	Feb.
3½ h.p., T.T.	£63	0	"
O.K., 2½ h.p.	£48	10	Feb.
P. & M., 3½ h.p. Combination	£102	0	Early.
ROVER, 3½ h.p.	£85	0	"
ROYAL RUB, 8 h.p.	£105	0	"
TRIUMPH, 4 h.p.	£87	0	Stock.

CARS.

A. & J., delivery May. A.C., May. ENFIELD, early. G.N. April. G.W.K., early. MORCAN, May.

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ROBBIALAC IS SOLD BY ALL ACCESSORY DEALERS.



MOTOR CYCLES FOR SALE.

Sunbeam.

SUNBEAM, T.T., 3½ h.p., 3-speed, especially built for the T.T. race, extra low, wide tank, guaranteed in absolutely new condition inside and out, heavy Dunlops, unsundered and unpunctured, Lucas lamps and horn, knee-grips, best Sunbeam on the road; what offers? Worth £100.—Reynolds, Waterbeach, Cambs. [4134]

3½ h.p. Sunbeam Combination, delivered July, 1917, tank, Binks carburettor, Lucas horn and tail lamp set, F.R.S. Major head lamp, new tyre on back wheel, others very good, new College shield, cycle service finish, sidecar black and gold, all in fine condition and mechanically perfect; first cheque for £90 secures.—Stanley Johnson, Bearsted, Kent. [X3952]

T.D.C.

T.D.C., 4½ h.p., 3-speed, pedal start; £39.—29, St. Leonard's St., Bromley-by-Bow. [4241]

T.D.C. De Luxe, 2½ h.p., late model, tyres and condition as new, splendid little machine, horn, and spare petrol tank; £24, or near offer; a bargain.—E. Saa Hotel, Stevenage, Herts. [4102]

Triumph.

1919 Triumphs in stock; £87.—Parker and Son, St. Ives, Hunts. [4156]

3½ h.p. Triumph, free engine, perfect order; £28.—125, Canal Rd., Mile End, E. [4176]

TRIUMPH 3-speed Combination, splendid condition; £45.—603, Lord St., Southport. [X4102]

1919 Triumph, 4 h.p., 3-speed countershaft, in stock; £87.—Rose's Garage, Uxbridge. [4258]

TRIUMPH, countershaft, 1919; early deliveries; £87.—Longman, Fisherton St. Salisbury. [2360]

1911 Triumph; £25; splendid condition, all spares.—Harrison, 33, Goldsmith Rd., Acton. [4065]

TRIUMPH, 3½ h.p., good condition, little used; £20.—Bellwood, Victoria Rd., Scarborough. [4256]

TRIUMPH, 1914, 4 h.p., 3 speeds, clutch, in new condition; £50.—33, Highfield Rd., Luton. [X3995]

1919 Triumphs in stock; exchanges quoted.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [4285]

2½ h.p. Baby Triumph, almost new; £50.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0492]

TRIUMPH Spares in Stock.—W. Brandish, Triumph Garage, 625, Foleshill Rd., Coventry. Phone: 1050. [X3568]

TRIUMPH.—Delivery from stock latest 4 h.p. countershaft models; exchanges.—Parker's, Bradshawgate, Bolton. [X4194]

TRIUMPH, 3½ h.p., splendid condition, with 1915 improvements; £23.—29, St. Leonard's St., Bromley-by-Bow. [4239]

1914 Junior Triumph, stored 3 years, perfect throughout; offers; private owner.—Box 19,327, c/o The Motor Cycle. [4389]

TRIUMPH, 3½ h.p., Mabon clutch, lamps, speedometer, good condition; £26.—Hole, 129, Park Lane, Carshalton. [4263]

TRIUMPH, 3½ h.p., 1911 clutch model, splendid condition, tyres nearly new; £25.—F. W. Parsons, South Petherton, Somerset. [4100]

TRIUMPH, 2 h.p., N.S.U. 2-speed, excellent condition, ready to ride away; £20.—Paine, c/o Shean, 1, Shirley Rd., Hayes, Middlesex. [4322]

TRIUMPH Motor Cycle, also 2-speed Pengeot, cheap.—The Cycle Mart, Church End, Finchley (trams from Golden's Green pass the door). [4173]

3½ h.p. Triumph and coachbuilt sidecar, N.S.U. 2-speed, free engine, smart machine; only £40.—Bury, 125, Canal Rd., Mile End. [4175]

TRIUMPH, F.E., 3½ h.p., recently overhauled, lamps, toolbags, Dunlop belt new, tyres excellent; £29.—9, Pelham Rd., Cowes, Isle of Wight. [4048]

RIDER TROWARD and Co., 31, High St., Hampstead.—Triumph, delivery February, 4 h.p., £87. Orders being booked for 2-stroke, earliest delivery. [4275]

1915 Triumph, 3½ h.p., T.T., free engine clutch, fine nickel plated rims, good enamel, splendid condition; £35.—53, Devonport Rd., Shepherd's Bush, London, W.12. [4152]

1919 Triumph, 4 h.p., 3 speeds, brand new; in stock, ready to ride away; first cheque secures £87.—Walbro Motor Cycle Works, Saffron Walden, Essex. Phone: 45. [X4105]

TRIUMPH, 4½ h.p., 1914, 3-speed, clutch; £48; recently overhauled by Triumph Co.—Call, Saturday or Sunday only, Skerchly, 11, Oxberry Av., Fulham (nr. King's Head). [X3962]

1911 Triumph, 3½ h.p., aluminium footboards, been overhauled by ourselves, replated and enamelled, horn and lamps complete; 32 gns.—Coventry Motor Mart, Ltd., 86, London Rd., Coventry. [X4167]

TRIUMPH, 3½ h.p., 1912, 2-speed and free, fast solo, in fine mechanical condition; trial here; sell £28, or exchange more power, big twin preferred.—Robinson, Castle Fold, Tickhill, Rotherham. [X4018]

MOTOR CYCLES FOR SALE.

Triumph.

TRIUMPH, 1919, 4h.p., 3-speed countershaft model, just arrived from works, now actually in stock; £87, first one secures.—Wilkins, Simpson and Co., 11, Hammersmith Rd., opposite Olympia, London. [4160]

1909 Triumph, 3h.p., Bosch, B.B., mag., nearly new Clancher tyres, just been overhauled, and in good running order, guaranteed: price £20, or offer.—On view, R. Haffenden, South View House, Vines Cross, Horeham Rd., Sussex. [4165]

1912 3½h.p. Free Engine Triumph, fitted with 1913 engine, decompressor model, semi T.T. bars, P. and H. lighting outfit, Stewart speedometer, new tyres, Dunlop belt, pun saddle, whole in nice condition, but requires new front mudguard; £30, bargain.—Booth, Dingle, Haverfordwest. [4088]

Tyler.

LATE 1915 Tyler-Precision, 2½h.p., F.E., 2-speed gear, footrests, electric head and tail lamps, new tyres, adjustable pulley, horn, handle-bar watch, just been overhauled, not used since; bargain, £25.—J. S. Watts, 33, Keenor St., Woolwich. [4167]

Vindec.

VINDEC, 3½h.p., with sidecar, 2-speed gear, Bosch, running order.—87, New Park Rd., Brixton. [4307]

FOR Sale, Vindec, 2½h.p., 2-speed, new tyre, just overhauled, ill health reason for sale; £25.—Ma. sh. Nollcot, Albany Rd., Fleet, Hants. [4305]

Williamson

WILLIAMSON 8h.p. Water-cooled Combination, splendid outfit; bargain, £75.—Speechley, 1, Gunnersbury Lane, Acton Hill, London. [4304]

Woll

2½h.p. Woll, new Dunlops, B. and B., Pedley, perfect condition; £23.—20, Tyrrell Rd., East Dulwich, S.E. [4066]

Zenith.

EARLY Delivery Zenith 1919 models.—J. O. Pickering, Shrewsbury. [4122]

6h.p. Zenith-Gradua, J.A.P., Bosch mag.; £35.—Clapham (Motors), King George St., Greenwich. [X4159]

1914 4h.p. Zenith-Gradua, excellent condition; bargain, £29.—Thorpe, Whitehorse Rd., Thornton Heath, S.E. [4367]

ZENITH Combination, 5h.p., 1914-1915 twin, Gradua gear, Bosch, Birks, sporting sidecar; £65.—Box L9,331, c/o The Motor Cycle. [4393]

RIDER TROWARD and Co., 31, High St., Hampstead.—Zenith-Graduas, new models, delivery this month; prices on application. [2274]

ZENITH 1914 8h.p. Combination, stored during war, very good condition, all accessories; £60.—R.R., 170, High St., Deptford, S.E. [4169]

ZENITH-J.A.P., 4h.p., 1912, engine rebushed, new valves, guides, etc., all Gradua gear parts new; £25.—40, Howley Rd., W. Croydon. [4324]

6h.p. T.T. Zenith, canoet sidecar, very fast, just overhauled, replated and re-enamelled, stored 4 years; £50.—104, Whitechapel Rd., E. [4093]

ZENITH, countershaft, 4-5h.p., 1915, 2 lamps, only used for two years; trial by appointment; £50.—Selby, Westmoreland Rd., Bromley, Kent. (D) [4225]

1914 Zenith, 4h.p., and sidecar, clutch, and kick starter, J.A.P. engine, Bosch mag.; £38.—Frankes, 27, Charlton Lane, Charlton, S.E.7. [4365]

ZENITH 4-5h.p. Twin, 1916, countershaft, clutch, kick start, all accessories, Stewart speedometer, magnificent condition; gift, £59/10.—Whitaker, 16, Ardium Rd., Highbury, N.5. [4180]

ZENITH Combination, 1915 (late), beautiful condition, as new, tyres new, been stored, 6-8h.p. twin; £85; no best offers.—Goodwin, Jeweller, Victoria Rd., Widnes, Entertain part exchange, runabout or good light car. [X3997]

ZENITH Combination, 1914, 6h.p., twin, clutch, kick start, like new, and splendid condition; £55; exchange big single combination, 5-6h.p. Rudge preferred.—Apply, after 6 o'clock, 67, Gordon Rd., Winstead, E.11. [4158]

ZENITH-GRADUA Combination, 1915, 8-10h.p., 90 bore, special racing model, large tank, large pulley Best and Lloyd feed in front cylinder, hand pump to crank case, Canoet racing sidecar; £85; also Lucas dynamo lighting set and Klaxon horn to fit; offer.—Box L9,285, c/o The Motor Cycle. [4077]

Ladies' Motor Cycles.

1916 Lady's 2-stroke Calthorpe, 2-speed, not ridden 500 miles, excellent condition; bargain, 30 gns.—"Glynol," Woodlea Rd., Worthing. [3732]

1915 Lady's Douglas, grand condition, low mileage, 2-speed, speedometer, P. and H. lamp, Spanton mechanical horn, pump, tools; real bargain at £43.—Marjorie Oates, Kylemore, Beechfield Rd., Huddersfield. [4136]

Miscellaneous.

LIGHTWEIGHT 2½h.p. Twin, Bosch, lamp, horn, good tyres; £22/10.—53, Devonport Rd., Shepherd's Bush, London, W.12. [4154]

2½h.p. Accumulator Motor Cycle, reliable, and ready for road; cheap, or exchange for sidecar or motor shed; combination also wanted; appointments.—Mende, 195, High St., Lewisham, S.E.13. [4146]

LONGMAN BROS.

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Agents for all Leading Makes.

Immediate Delivery of Triumphs, Norton (3 weeks),

Diamond-J.A.P. (10 days).

Earliest possible delivery of Douglas, A.B.C.,

Henderson, James, Rudge, Harley-Davidson, etc.

Place your order now.

SECOND-HANDS IN STOCK.

NORTON, 3½ h.p., 1916, 3-speed countershaft, and coachbuilt Sidecar, equipped 79 gns.

B.S.A., 1915 (late), 4½ h.p., all-chain drive, coachbuilt Sidecar, equipped £69 0

ENFIELD, 1914, 6 h.p. coachbuilt Combination, equipped 69 gns.

ENFIELD 6 h.p. Combination 68 gns.

ZENITH, 1915, 6 h.p. countershaft coachbuilt Combination 50 gns.

ZENITH-GRADUA, 6 h.p., sporting Sidecar 40 gns.

TRIUMPH, 1912, 2-speed, equipped 30 gns.

TRIUMPH, 1911, clutch model 28 gns.

All the above are in excellent condition, and a further number of machines and combinations expected in before the publication of this list.

N.B.—Owing to the Ealing premises undergoing repairs, all enquiries to be made to Acton Branch.

"CHEMICO"

Have you a good tyre that's badly cut? If so, don't worry; it is still a good tyre. All that is wanted is

"CHEMICO" TYRE STOPPING

Your good tyre will be as good as ever in a few hours. It amalgamates with the rubber in the tyre, making a perfect union. CAN'T FALL OUT.

CAN'T EVEN BE PICKED OUT.

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—CHEMICO WORKS, BIRMINGHAM.—



Miscellaneous

THE H.C. Motor Co., 347, Finchley Rd., N.W.3, have the following machines for disposal:

JUNO, 1918, 3½h.p. J.A.P., Sturmer-Archer countershaft gear, new machine; 69 gns.

ENFIELD, 1915, 3h.p. twin, Enfield gear, perfect order; 37 gns.

PREMIER, 1913, 2½h.p., 3-speed, clutch, pedal start, just overhauled; 27 gns.

ZENITH Combination, 1914, 6-8h.p. J.A.P., sporting coach sidecar, perfect; 69 gns.

INDIAN, 1915, 7-9h.p., 2-speed, kick, clutch, just thoroughly overhauled; 49 gns.

T.A.C., 10h.p., 4-cyl., 3-speed, spring back and front, just completely overhauled, with sidecar chassis; 49 gns.

T.D.C., 3½h.p., Grade gear, Bosch, good order; 19 gns.

AUTO-WHEEL, 1915, fitted to Triumph, 1916, best 3-speed gear gent's cycle, perfect order; 19 gns.

SINGER, 1914, 3h.p., open frame, 2-speed, kick, clutch; 34 gns.

ARIEL, 4h.p., new machine, just down from makers; £80

HUMBER, 2½h.p., 1914, twin, single speed, good order; 24 gns.

TORPEDO, 1914, 2½h.p., 2-speed, Precision engine; 22 gns.

A.L.P., 1½h.p., 1913, perfect order, Bosch mag.; 18 gns.

MARTIN-J.A.P., 3½h.p., o.h.v., one of Harry Martin's racers, very fast, and perfect throughout; 35 gns.

THE H.C. Motor Co., 347, Finchley Rd., N.W.3. Phone: Hampstead 4631. Open Saturday afternoons and Sundays. [3583]

JONES' Garage.—1919 Victory Model Matchless, spare wheel all wheels detachable and interchangeable; £140.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1919 New Imperial combinations, 3-speed and hand-controlled clutch; £126.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1919 Model K B.S.A.; £79/16.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1919 3½h.p. Ariel, 3-speed and clutch; £80.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1919 New Imperial lightweight; 48 gns.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1919 James 5-6h.p. combination, splendid outfit; £126.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1919 W.D. Douglas, 2½h.p., 2-speed model; £60.—Broadway, Muswell Hill, N.10.

JONES' Garage will have all other makes as soon as the makers start supplying.—Broadway, Muswell Hill, N.10.

JONES' Garage, short 'bus ride from either Finsbury Park or Highbury Tube Railway.

JONES' Garage.—1916 semi-T.T. 3h.p. Enfield, as new; £55.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1914 Calthorpe-Jap, 2-speed; £32.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1914 Zenith-Gradua, 3½h.p.; £45.—Broadway, Muswell Hill, N.10.

JONES' Garage.—New Ixion 2-stroke, not done 200 miles, fitted with all lamps, etc.; £35; like new.—The Broadway, Muswell Hill, N.10.

JONES' Garage.—1913 Rudge Multi, new tyres and belt, in perfect mechanical running order, lamp, etc.; £32.—The Broadway, Muswell Hill, N.10.

JONES' Garage.—1913 G.W.K., head, screen, lamps, horn, etc., in very nice order; £128.—The Broadway, Muswell Hill, N.10.

JONES' Garage.—1913 3½h.p. New Hudson and sidecar, 3-speed and clutch, all lamps, etc., in very nice order and condition; £35.—The Broadway, Muswell Hill, N.10.

JONES' Garage.—Coventry Simplex-Jap, 3½h.p., T.T., machine built for speed, will do 70 m.p.h., large tank; £30.—The Broadway, Muswell Hill, N.10.

JONES' Garage.—1917 Allon, 2-speed and handle-bar controlled clutch, fitted with light sidecar, absolutely like new; £52/10.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1915 2½h.p. New Imperial, 2-speed, as new; £42.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1913 P. and M. and sidecar; £55.—Broadway, Muswell Hill, N.10.

JONES' Garage.—Nearly new O.K. Jap, 2-speed; £42.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1917 2½h.p. New Imperial, 2-speed, as new; £45.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1916 8h.p. Excelsior-Jap combination, Sturmer-Archer 3-speed countershaft gear, dynamo lighting (Lucas), lovely coachbuilt sidecar, a beautiful outfit; £105; like new.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1914 T.T. Triumph, 4h.p.; £50.—Broadway, Muswell Hill, N.10.

JONES' Garage will be pleased to give further particulars of any machine or machines upon request.

JONES' Garage.—Lists upon application.—Broadway, Muswell Hill, N.10. [4398]

THE MOTORCYCLE

ESTABLISHED IN 1903

AND FOR OVER SIX YEARS THE ONLY PAPER SOLELY DEVOTED TO THE PASTIME

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Cultivating Overseas Trade.

WE recently had a visit from an Australian soldier who, like most natives of our Overseas Dominions, is thoroughly loyal to the old country and keen to buy articles of British manufacture in preference to those made abroad. He was most emphatic about the splendid way in which the American firms handled their business in Australia, the wonderful manner in which their agency businesses were run, the excellent service they gave to their customers, and their very efficient method of handling their spare parts business. He told us of a British-made motor bicycle of well-known make which had been for some months out of commission, while a spare part for an American motor bicycle could be purchased at the local store in practically any town of importance.

Of course, this may be an exaggeration, but it would show that the British manufacturer still does not take sufficient personal interest in Overseas conditions. Here is another instance: an agent in Japan writes to an American paper, "Before the war we had many English motor cycles in Japan, but they are not powerful enough to ride about this mountainous country. In addition to that, it is not convenient to get hold of spare parts of the machines as American makes. For my conclusion I will say American motor cycles are very suitable to use in Japan, and will increase in number after the war. Motor cars and cycle cars are no good for Japan." *Sic!*

This and similar comments should be duly noted by British manufacturers; it is quite time that they recognised the importance of Overseas trade—trade which should flourish not only in the British Dominions but also in foreign countries. If motor cars and cycle cars are "no good" in Japan, here is a glorious opening for the British motor cycle manufacturer. It is a thickly populated country, and there seems to be a large scope for pushing firms, and we sincerely hope

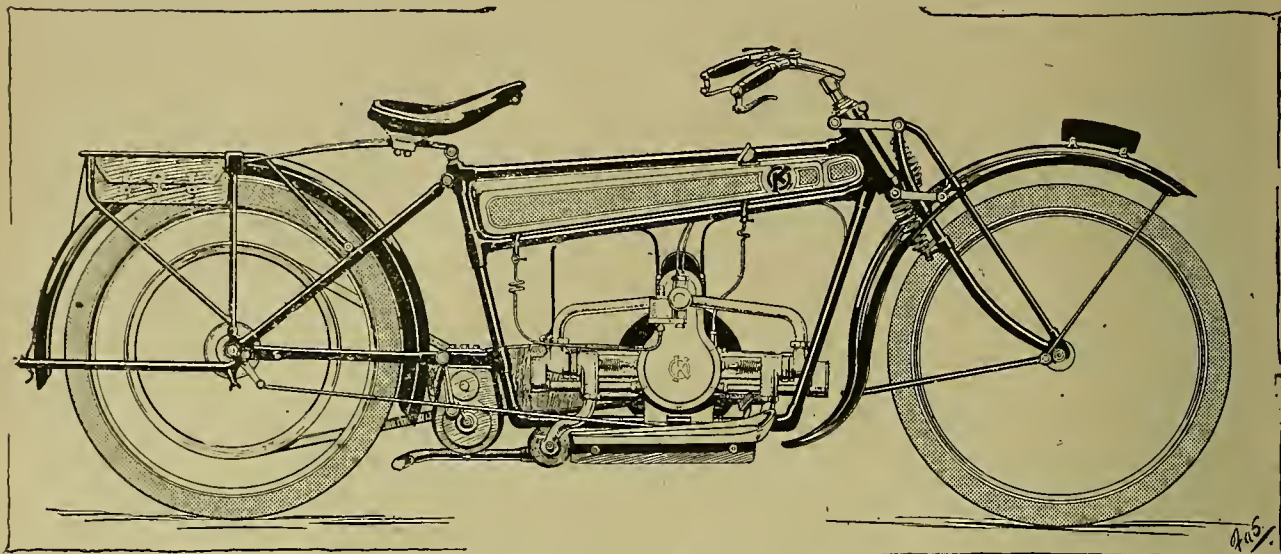
that a year hence we shall not be compelled to read such letters as the above in the American or any other journals.

The Petrol Control Department.

THERE is every reason to suppose that the Petrol Control Department will cease to exist in about a month's time. That much-blamed body has done its duty. It helped to conserve petrol when stocks were very low, and it is now but the means of collecting the advance tax of 6d. per gallon which was imposed by the Government, making the total tax 1s. upon petrol. This measure was put forward as a war expedient, and, now that the war is over, it is almost certain that the tax will shortly be removed, as it is clearly a severe burden upon the motor industry. There is now no shortage of petrol; benzole has been released from control; motor spirit vouchers, though originally intended for use in a certain month, may now be used for the purchase of petrol at any time, and it is, moreover, the intention of the Petrol Control Department to simplify the procedure. An applicant who intends to renew his licence need only write to the Department, state the number of his old licence, and ask for any number of gallons of petrol he may require, and send with his letter a cheque representing the 6d. for every gallon he demands. It is patent that this gradual relaxation must before long end in the total disappearance of control, but it is extremely urgent that the Petrol Control Department should disappear soon. It is costing the country an enormous sum to run; its *raison d'être* has ceased to exist. At the present time its sole function is to collect the tax, and the collection by such means is a very costly process. Moreover, motorists and motor cyclists have done an enormous amount for their country during the war, and it would be only just for the Government, as a *quid pro quo*, to eliminate the control of petrol as quickly as possible.

THE O.K. PROGRAMME.

Mass Production of One Model—a New 347 c.c Flat Twin.



The new 2 1/2 h.p. O.K. flat twin as it will appear when complete.

A NEW model flat twin intended for solo work will shortly be introduced to the motor cycling public by the makers of the O.K. lightweight. This machine has been designed and is being produced by Messrs. Humphries and Dawes in their own factory, and will mark the entry of this firm into the motor cycle manufacturing field as distinct from that of assembling.

The war has wrought many changes, and it is necessary to obtain a different perspective of the various makes and makers from that of pre-war days.

Nearly every motor cycle manufacturing firm has considerably extended its factory

met in the new O.K. by 26 x 2 1/2 in. wheels, which on a 350 c.c. lightweight may be regarded as ample.

Duplex Frame.

Straight tubes are used throughout the frame which is of the duplex type, and departs in several ways from conventional design. In the first place, the top tubes both slope to the rear, but the lower members which support the tank drop at a greater angle than the tube over them. This is the reverse of general practice. On this point it may be said that fashion has been sacrificed for a more scientific design.

The steering head is a somewhat massive casting webbed at the rear and embodying the lugs for no fewer than five tubes, of which the top tube of the frame is 1 1/2 in., the duplex longitudinal tubes 3/4 in., and the "down" tubes 1 in. The top tube terminates in a "seat" lug of the

conventional type, and both pairs of tubes, which are a little over 2 in. apart at their centres, connect with the single "seat" tube by neat U shaped lugs. The sloping front down tubes diverge towards the bottom in order to facilitate removal of the front cylinder, and are connected to the parallel horizontal tubes supporting the engine by means of double elbow lugs. The design at these points is shown in the drawing of the frame.

As before mentioned, there are no bent tubes in the construction of the frame. Where the rear stays are usually bent substantial castings are used on both lower and upper forks, two short parallel tubes being used to support the gear box, and a simple means of adjustment provided in the form of a draw bolt with locking nuts. The stays are made exceptionally wide to accommodate 6 in. domed guards which are deeply valanced.

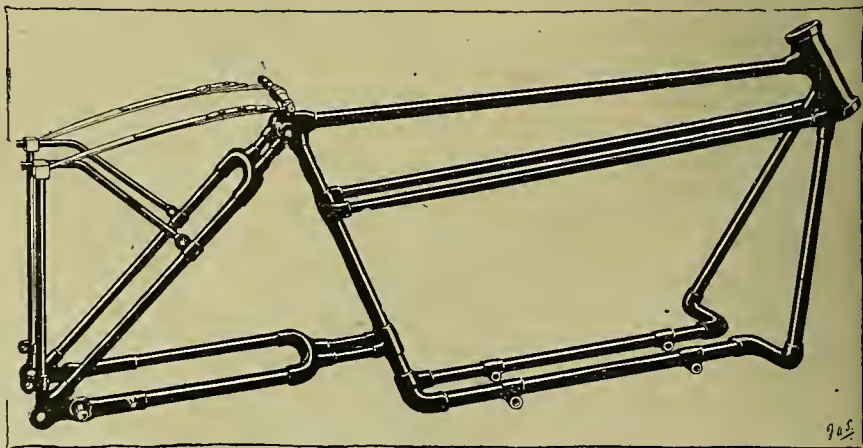


The combined footboards and undershield.

during the last four years, while some have entirely outgrown the popular conception of their standing. It is permissible, perhaps, to class Messrs. Humphries and Dawes in this latter group, as while, before the war, their average output of motor cycles was comparatively small, their extensions during the past few years have increased their production capacity to between 200 and 250 machines per week.

The New O.K.

The new proposition is a flat twin solo machine, which has been designed with a view to meeting the requirements of a large section of the riding public at home and abroad. The first essential of the colonial machine is ample ground clearance, and on this point the new O.K. certainly scores with 7 in. clearance, while large tyres are another Overseas demand,



Every tube in the O.K. frame is straight. The vertical tubes of the carrier fit into split sockets on the stay ends.

The O.K. Programme.—

The 26 × 2½ in. wheels are fitted with disc adjusting hubs and withdrawable bolts, the combination of which is novel so far as motor cycle wheels are concerned.

Another feature of the frame part of the machine is the combined sheet metal undershield and footboards. The latter are covered with aluminium and are shaped and beaded at the edge. This unit is carried on the frame by two bolts, which pass through the sides below the footboards into lugs on each of the parallel tubes.

Flat Twin Engine.

From the size and general specification of the machine one expects an engine of greater capacity than 347 c.c. The first impression is that a lightweight engine is fitted in a "3½" frame, which is due, no doubt, to the somewhat long wheelbase and the 2½ in. tyres.

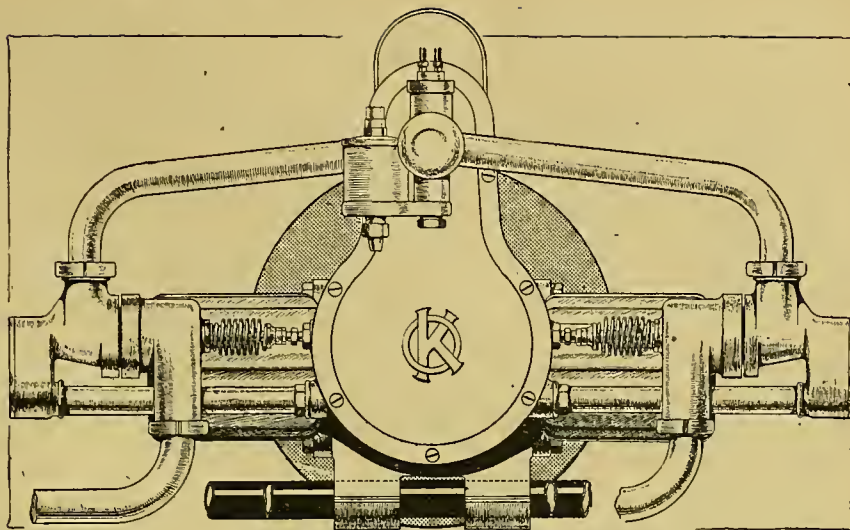
The bore and stroke of the opposed twin engine are 60.7 and 60 mm. respectively, and it has overhead induction valves with enclosed operating mechanism, which is well lubricated through the tubular case enclosing the long tappet rod. This system has been proved to be most satisfactory on one or two well-known engines.

Exhaust valves of generous dimensions are located at the side of the cylinder heads, and the shape of the combustion chambers and the size of the pockets should assist scavenging.

Timing Gear.

A distinctly novel system of valve operating mechanism is embodied. Two cams are formed on an internally cut gear wheel which meshes with the driving pinion. The sprocket for the silent chain driving the magneto is fixed to the cam wheel, and the complete member is supported in a long bushing bearing, which in turn is carried in a bracket fixed to the side of the crank case wall by four studs. By removing four nuts the cam wheel and sprocket can be withdrawn with its bearing.

The cylinders, which are staggered, have horizontal radiating fins, and are secured by means of two studs only. The connecting rods, on account of the staggering of the cylinders, are central with the pistons. Hoffmann roller bearings support the one-piece crankshaft, while split bearings, provided with bronze



The 2½ h.p. O.K. flat twin engine has overhead inlet valves.

bushes, are used on the big ends. The lubrication will be on the splash system. A silent chain, enclosed in the timing gear case, drives the centrally disposed magneto. The carburettor will be an Amac.

The drawing of the engine shows somewhat long induction pipes, but we understand this point is receiving further attention on the part of the designers, and that in all probability the lay-out of the induction pipes will differ from the present design.

Mass Production.

Details are not available of the gear box, but we understand that it will be of the two-speed constant mesh type, embodying kick-starter and clutch. The transmission will be by chain to gear box, and final drive by ½ in. belt. The tank will have a capacity of two gallons.

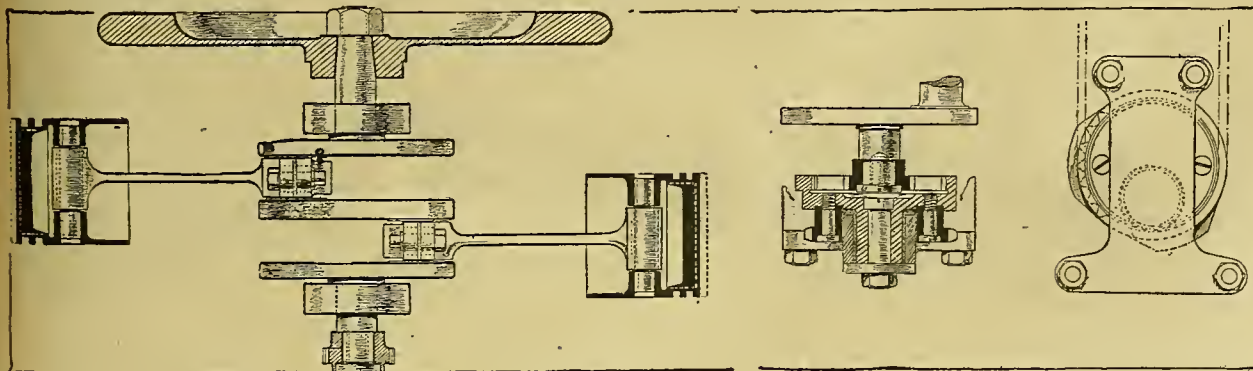
Up to the present it has not been possible to fix the price of the new machine, but we are told this will be in the neighbourhood of £50.

It is hoped, by the time the machine has passed through its tests, that the latest extensions to the factory will be complete. These will increase the floor space to approximately 1½ acres. The

lay-out of the factory is such that the work progresses in one direction from the time it enters the receiving store until finished machines emerge at the packing shops near the railway siding, which runs into the works.

The work of Messrs. Humphries and Daves during the war has necessitated installing an up-to-date plant in every way suitable for the mass production of motor cycles, and it is anticipated that an output of at least a hundred machines per week will be reached this year. Plans are being made, however, to increase this by over a hundred per cent.

War contracts included a great deal of tubular construction work, and the experience gained will be of inestimable value in the production of the new motor cycle, while it is the intention of the firm to maintain the rigid systems of inspection and the fine limits imposed by Government requirements to ensure accuracy and interchangeability. In short, the O.K. firm intend to restart motor cycle production in such a way that no lesson of war work, which can be applied to motor cycle construction, will be wasted, and that their progress will be commensurate with that of the engineering world in general.



The crankshaft assembly of the 2½ h.p. O.K., showing the roller bearings on the mainshaft, the half-time pinion, and the split big ends.

The novel timing gear. The cams are formed on an internally cut gear wheel, to which also the magneto chain sprocket is fixed.



A Commentary based upon Practical Experience and a Study of Overseas Opinions.

British Overseas Models. THERE appears to be no doubt that *The Motor Cycle* campaign in favour of British machines suitable for Overseas is to fructify this year. At last the makers of this country appreciate that the requirements of riders in Great Britain are practically identical with those of our Overseas Dominions, and are designing their new products accordingly. All-chain drive, larger wheels and tyres, increased ground clearance, larger tanks, stronger and wider guards are rules of the day both in new solo and sidecar machines which, with the several "Overseas" models produced for the Russian Government, place the British motor cycle industry in a position better to meet the requirements of the Overseas rider than it has ever been. There are signs, too, that the various trade organisations

are seriously considering questions to facilitate commercial arrangements which should be of ultimate benefit to the motor cyclist abroad.

□ □ □

Spare Parts. In short, Overseas trade as a means of increasing output and so reducing cost is now part and parcel of the future policies of our most progressive firms, and, as the supply of replacement parts is so necessary to obtain and maintain goodwill abroad, this question is not likely to be overlooked. During the past four years many of the motor cycle firms have come into direct contact with the Government Departments concerned with the furnishing of spare parts for the technical sections of our Army, and the lessons obtained must be of benefit to them in gauging the importance of the subject.



D.R.'s MIDST THE ITALIAN ALPS. Although despatch riding in Italy, Egypt, and the Near East was no mere joy ride, there must be some recompense to D.R.'s in having visited some of the most lovely scenery in the world, beheld the antiquities of Egypt, and the ancient cities of the Holy Land. With the majority of motor cyclists the opportunity of such sight seeing in the ordinary course of events would have been remote in the extreme, yet full appreciation may not be felt until they are back in humdrum civilian life.

Overseas Section.—

It may be said that one of the greatest problems which the R.A.F. had to face was the supply of spares for aeroplanes, lorries, cars, and motor cycles—a proposition rendered more difficult by the number of different models used by this branch of the Service. That the problem was solved is a certainty, and many of the men who brought order out of chaos were members of the motor industry. As to whether the methods employed can be successfully applied to the supply of motor cycle spares Overseas may be a moot point, but undoubtedly the experience has taught hundreds of men to appreciate the importance of this question, which, before the war, was treated with a certain amount of apathy.

A Selection of Letters from Readers scattered all over the World.

Requirements in Dutch East Indies.

MR. G. K. FERRES, writing from Soengei Brohol Estate, Post Tebing Tinggi, Deli Sumatra, Dutch East Indies, says:

"Am specially interested in your paper since you have started a separate section for 'Letters from Overseas.' I am a keen motor cyclist, and have had some years' experience with both a Douglas and a $3\frac{1}{2}$ h.p. Triumph (three-speed Sturmey-Archer) in this Equatorial climate.

"My Triumph I have used with a sidecar for nearly two years, and it has done marvellous work.

"I have (without sidecar) done some real hill-climbing. We have one health resort—Brastagi—which is situated about 3,000 feet above sea level, and one has to do the last 2,500 feet in the final twenty-six miles. The road is simply cut into the rock, and there are about 500 hairpin bends.

"There have been so few motor cycles in this district that some of the natives simply ran away thinking, I have no doubt, that one of their famous ghosts was at last on their track.

"By the way, I have only to emphasise the remarks of most of your Overseas riders—unless Old Britain bucks up with 28in. wheels, better springing, and different handle-bars, then even the Britishers Overseas are going to favour the Americans.

"What I want to see is an 8 h.p. J.A.P. engine on a frame like the Indian or the Harley-Davidson—with something sporting about it! Cannot you people in the 'Old Country' realise you are 'old-fashioned'? Now is the time to get a move on! Let us hear of some big factory in England turning out motor cycles by the thousand—motor cycles which one can compare with the Americans in price, appearance, and size."



Mr. G. K. Ferres and his $3\frac{1}{2}$ h.p. Triumph, to which is attached a sidecar made of "rattan."

Without doubt the secret of the R.A.F. success was its central organisation, which maintained supplies at its depots the world over. A similar organisation may be possible in connection with motor cycle spares; in fact, it is rather a matter for co-ordinated effort than one to be dealt with by each individual firm on its own behalf. Whether there should be different institutions composed of members of the retail trade in each country or one central manufacturers' organisation in the Home country with branches abroad is one for the retailers and makers to decide. However, something on these lines would be of great assistance to the private Overseas buyer, and unquestionably prove another attraction to the purchase of British machines besides stimulating the trade.

Appreciation.

MR. P. KYLE, writing from Mbulamuti, Uganda, Central Africa, says: "I am writing to express my gratification for the page of photographs of 'Summer Scenes in Many Counties,' in *The Motor Cycle* last summer.

"A few photographs like these are 'as cold waters to a thirsty soul' to us exiles on the outposts of Empire, and are a pleasant diversion from technical articles on valve designs and front wheel springing, although I quite appreciate the fact that you have to cater for all tastes.

"I hope we shall have more of these photograph pages in the future."

Illuminating Criticism from Ceylon.

REV. A. M. WALMSLEY writes from Ceylon on several subjects of topical interest:

"I am glad that from time to time you take up the question of sparking plug design, and trust you will continue to urge the British manufacturers to improve the quality of their productions. Doubtless the war, especially in the air, has taught them much; but, so far, I believe, none of their improved methods has borne fruit in Ceylon. My own experience may prove interesting.

"Some time ago I put into the front cylinder of my Powerplus Indian a single point English plug, made about 1914, and practically new. Soon afterwards I noticed, in climbing a tricky pass that rises about 1,000 feet in three miles, that misfiring set in after the first two minutes, and unless I changed down at once the machine conked out. Thinking the engine was foul, I decarbonised, and put thick washers under the cylinder bases. On attempting the hill a second and third time, with a clean engine and reduced compression, I found that the same thing happened again.

"On removing the plug I saw that the central electrode looked as though it had been heated to white heat in a furnace, as, indeed, it probably had! I substituted a single point Splitdorf plug that had seen good service. Four or five times since then I have had to climb the same pass. There has not been the slightest sign of distress on top gear, except on my part, when I found I was cornering too fast, and likely to break my neck! I have had to scrap the troublesome plug.

"Re twist grip controls, mentioned by Mr. Merlin in your issue of January 10th. I am with him all the way. Ceylon probably provides as tricky riding as most countries, and, to my mind, there is no comparison between the English and American methods of control. For how many years has 'Ixion' been grousing about 'tap-twiddling'? Give me a handle which I can grip with the whole of the hand whilst controlling the machine, and no danger of the wires rusting up after a monsoon downpour. The latter trouble has nearly caused an accident more than once.

"And what is the matter with the automatic carburettor? Has not 'Ixion' been shouting for this for ages? Somebody said in *The Motor Cycle* recently that the automatic carburettor and twist grip control conduced to careless driving on extravagant mixtures. I do not see it. Take the Schebler carburettor—adjustable jet; by-pass (with the effect of a pilot jet) also adjustable; hot air intake; extra air intake; high speed adjustment, etc. The adjustable

Overseas Section.—

jet, extra air intake, and high speed adjustment are easily reached from the saddle, and indeed I usually tune up my carburettor whilst driving, with a hot engine, to suit elevation above sea level, temperament, or any other 'error of the day.'

"A short time ago I drove my Powerplus seventy-five miles up a climb of 6,000 feet on just about one and a quarter gallons of war petrol. I do not want anything better than that.

"Lastly, with regard to 'Goods Made in Germany.' I hope you will stick to your resolution. Personally, I do not see how any right-minded man on the surface of the globe can have anything to do with either Germans or German goods for the rest of his life. For my children, who are mercifully too young to know what is going on, it may be possible; but, for me, with the thought of a thousand unbelievable horrors burned into my memory, never!"

Spares and Repairs in India.

MR. F. W. HENDERSON, Sind, India, writes: "I have been very interested in the remarks of correspondents regarding the requirements of Overseas riders, such as 28in. wheels, good ground clearance, strong countershaft gear, and full chain drive. (For preference, I would prefer a shaft drive.)

"Among the many suggestions made, I do not ever remember one on the difficulties of maintaining a cycle in good running order or of having repairs properly executed. (I confine my remarks exclusively to India.)

"The so-called garages out here can carry out the decarbonising jobs, painting, enamelling, or changing bearings; but when it comes to a general overhaul, one has to be very careful to whom a motor cycle is entrusted.

"I know a firm of so-called motor cycle repairers and accessory dealers who did not know how to retune a machine when the timing gear had been upset. The firm had to borrow a 'Hints and Tips,' and finally I did the job in return for a free charge of petrol.

"Now, sir, this leads me up to the object of which I am writing to you.

"Manufacturers place machines on the market in India. They are purchased. They run. They wear, and get neglected, and the end is a breakdown. They go to the garage, and, after a few months of trouble and much expense, they are sold as duds, only to be doctored up and put on the second-hand market as thorough-going reliable machines, but in reality 'fakes.'

"Now, why do not English manufacturers combine to have a reliable representative (a practical bench mechanic) at Bombay, Calcutta, and Lahore, or even Karachi, fully

equipped with spares, and fully conversant with the types of machines he represents? My contention is that riders out here could then have repairs properly done, and manufacturers' wares would be saved a bad name. The Indian untrained, self-taught mechanic, undertakes a job, and the owner of the machine condemns the job and the machine as unreliable.

"Two machines suitable for work in India are the Overseas and the L.M.C. A friend of mine rode the former and I possess the latter machine. It has done 15,000 miles in twenty-one months. It has been entirely ridden, overhauled, and decarbonised by me. I have had to change nothing beyond the automatic variable driving pulley. I do not hold a brief for the L.M.C. people, but mention this to prove the necessity of manufacturers combining to place qualified mechanical men as representatives in the chief cities of India: men who could push business and be capable of guaranteeing a repair. I am a railway man, and thirteen years in India have proved to me that, with a leader to guide the Indian mechanic in the repairs to motor cycles or car engines, it is possible to make him as qualified as he is at locomotive repairs. At the present time all motor cycles in India live on the reputation gained in England.

"Now that the war is over, we may see a great change in opinions regarding things motor cycling. Personally, I cannot understand why the L.M.C. is not more in evidence, as it is an exceptionally fine machine for overseas work."

Overseas Trade.

"KANGAROO," writing prior to the Armistice, says: "It is agreed that when the war is over our greatest national need will be the highest possible measure of production. In no other way can the vast war bill be liquidated. Without a market, however, production is not wealth; therefore, co-equal in importance with production itself is efficiency in marketing.

"Where America and Germany, in pre-war days, outdistanced the British was in the marketing, and had British goods been of better quality than that of their greatest competitors, the race for commercial supremacy would have been lost. The valuable asset of Britain's reputation for good quality is most valuable to the country, but British quality plus more up-to-date business methods would render our position more secure.

"In pre-war days the Britisher had the advantage of a preferential tariff, yet did not succeed in holding his own, but *there may not be a preferential tariff always.*

"Certain it is, the old comfortable, happy-go-lucky kind of world we knew in July, 1914, has vanished for ever. The Prime Minister once said that 'we must go on or go under.' Let every manufacturer apply those words to the wider outlook of the future."

MOTOR CYCLES IN SPAIN.

A Big Potential Market for British Machines.

IT would appear that there is a promising market for English motor cycles in Spain. The actual number of machines now in that country cannot be given accurately at the moment because the Government has only just insisted upon a complete registration, but there is no doubt that the number is increasing rapidly, though unfortunately, from the British point of view, the majority of machines reaching Spain have necessarily, during the past four years, been of American origin, chiefly Indians and Harley-Davidsons. Previous to the war, however, the better known English makes, such as the Douglas and Triumph, were greatly favoured.

Opinions of a Britisher in Barcelona.

We recently had an interesting talk with Mr. Harry Walker, of Barcelona, who represents a large number of British accessory firms in Spain, and who is very closely in touch with motoring generally in that country. Mr. Walker laid stress on the necessity of English manufacturers making every effort to get back their pre-war standing in the Spanish market.

At the same time he remarked that the present popularity of American machines is not necessarily entirely due to their own merits, but largely to the fact that their makers adopted the policy of stocking with spares and supplies, not only the

principal agent in each province, but also a certain number of carefully selected sub-agents, the result being that the Spanish buyer is usually satisfied with an American machine, instead of, as has often been the case in the past, having to wait a considerable time for a British machine, which frequently it was necessary to order.

With regard to sidecars, it would appear that these are exceptionally popular, and in fact the tendency is to buy high powered motor cycles with sidecars attached. The English-made sidecar is infinitely superior to that of any other country and this fact is well appreciated by the Spanish buyer, but, unfortunately, the duty is three pesetas per kilo., which is approximately equivalent to 4½d. per lb. This high duty renders it difficult to sell any great number of British-made sidecars, because the price of the complete outfit necessarily becomes very near that of some of the cheaper local light four-wheelers.

In these days of high prices it may perhaps seem Utopian to talk of any sort of four-wheeler to sell under £100, but Mr. Walker is emphatic that if it is possible to make a cheap form of cycle car, particularly one possessing a sporting appearance, to sell in Spain at less than £100, there will be an immense demand in that country for such a machine.



CURRENT CHAT

Times to Light Lamps.

GREENWICH TIME.

Feb. 27th	...	...	6.3	p.m.
Mar. 1st	...	...	6.7	"
" 3rd	...	...	6.10	"
" 5th	...	...	6.14	"

Motor Cycles in the U.S.A.

There are over 20,000 motor cycles in use in the State of Ohio alone. It is expected that this figure will be increased by 50% during 1919.

The Motor Legislation Committee.

The Chairman of the Motor Legislation Committee, which has been organised to deal with questions affecting motor users, and has arranged a conference to consider the present-day regulations, notifies the organisations concerned of the resolution that representation on the Committee shall not be conditional upon subscription to its funds, and extends the invitation to the associations to provide representation on such Committee.

Manufacturing Assistance.

The largest manufacturers of motor cycles are not all in the best position to resume production of the staple goods. A few weeks ago we referred to one large firm requiring manufacturing assistance, and we have been able to place them in touch with engineering concerns who could undertake such work. We now hear of another important motor cycle manufacturer who requires similar assistance, either in making complete engine or gear units, or the entire machine.

The Sky-pilot.

We heard recently from Mr. R. M. Bankes-Jones, who is now a pilot in the R.A.F. He was formerly curate at Sunningdale, Berks., and a frequent contributor to this journal before the war. He writes: "Congratulations on the new lease of life *The Motor Cycle* has taken on, after surviving the war period. There are sure to be big days ahead for the motor bicycle. I have been in the Egyptian Expeditionary Force since last May, and do not know when I shall return to the United Kingdom. In any case, I shall be sorry to give up flying when the time comes. So far I have flown the old Rumpety, D.H.6, D.H.9, Avro, Pup, Camel, Bristol Fighter, B.E.2C.D.E. and 12, R.E.8, 90 and 160, A.W. S.E.5, but not a Handley Page yet!

The N.M.C.F.U.

The Sheffield branch of the Union will hold a meeting on March 29th, and a lecture will be given by Mr. L. B. Henderson, A.M.I.A.E., on March 15th. The venue in both cases is the Imperial Hall, Pinstone Street, Sheffield.

The Late Mr. E. Powell.

We regret to record the death of Mr. Edward Powell, which occurred in London on February 16th. Mr. Powell was a well-known figure in the motor world. He was president of the S.M.M.T. from 1914 to 1918, and formerly associated with the Humber Co.

St. Thomas's Secretary Honoured.

We offer our hearty congratulations to Mr. G. Q. Roberts, secretary of St. Thomas's Hospital, on being awarded the C.B.E. Mr. Roberts is the head of a motor cycling family. His eldest son, C. Q. Roberts, was well-known in the motor cycling world as a skilful competitor on a Blackburne in competitions prior to and during 1914. He enlisted as corporal R.E. at the beginning of the war, and was later killed in action. His other son is also a keen motor cyclist.

Special Features.

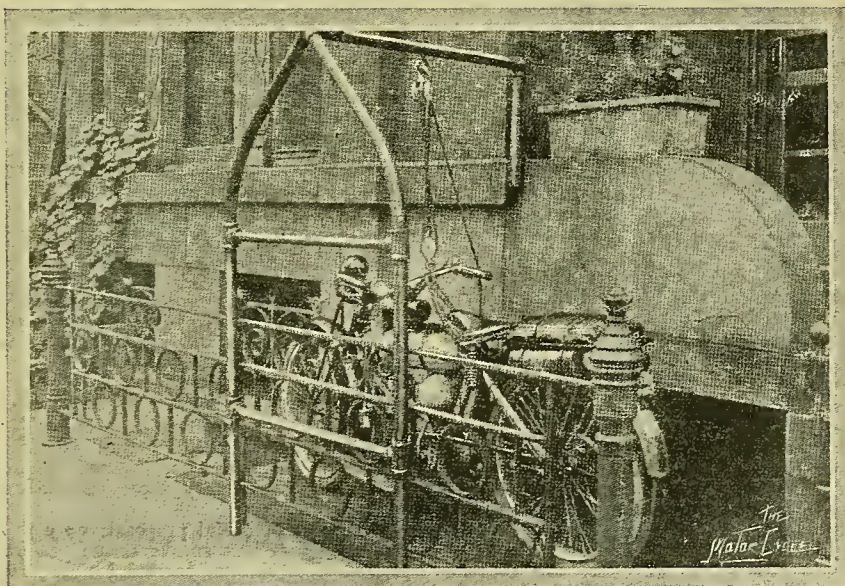
TWO NEW FLAT TWINS.
FROM KILIMANJARO TO NYASA.
PREPARING FOR THE ROAD.

What is it?

A French sporting daily advertises in the second-hand column a "Sidecar, Triumph-Rudge, 1450 francs." It would be interesting to know what sort of machine this is; some weird transformations have occurred in connection with military machines "over there," but a Triumph-Rudge sidecar combination is somewhat mysterious.

Rover Prices.

The 1919 prices of Rover motor cycles are now announced, and range from £67 to £132 10s. The former price is for the single gear model. With hand controlled Philipson pulley the price for the 3½ h.p. is £72, and with three-speed countershaft gear £85, the 3½ h.p. sidecar outfit being £117 10s. The 5-6 h.p. twin machine is £100, and £132 10s. with sidecar. The sidecar alone is £32 10s.



How an American motor cyclist solved the garaging problem. A block and tackle was fixed to a specially constructed supporting beam and used for getting the machine in and out of the basement.

Velocette New Prices.

The revised price of the 2½ h.p. two-speed Velocette is £48 and the ladies' machine £50.

New Flat Twins.

In this issue we give particulars of the new O.K. and the Harley-Davidson flat twins, which differ considerably in one respect at least. The former has a somewhat long wheelbase, and that of the latter is exceptionally short.

Coming Events cast their Shadows before.

"These commodious premises, suitable for club, public institution, or conversion to flats, to be sold (with early possession); floor space about 20,000 feet super." This notice is shown outside the Petrol Controller's premises, Berkeley Street, and no doubt foreshadows an early demise of this Department—an event which is already overdue.

Benevolent Fund Concert.

The Birmingham Centre of the Cycle and Motor Trades Benevolent Fund had a crowded house at their tenth annual Bohemian concert at the Temperance Hall, Birmingham, on the 21st inst. The chairman (Mr. Boulton Brooks) and secretary (Mr. A. C. Huckstepp) reviewed the splendid work of the past year, 300 new members being enrolled and £550 disbursed. The fund gives substantial help to unfortunate trade members. Mr. W. A. Standing, editor of *The Motor Trader*, and Mr. J. B. Clarkson, of New Zealand, also spoke. The latter intends forming a Colonial branch of the fund on his return "down under."

A Motor Cyclist in Charge of a Siege Battery.

W. S. Fitchett, who, before the war, was manager of the repair department of the New Hudson Cycle Co., Ltd., writes to say that he will soon be back at his old job. In 1915 he was enlisted by the Editor of *The Motor Cycle* in the M.G.C. and afterwards obtained a commission as a workshop officer R.A.S.C. (M.T.), having charge of a mobile workshop in France. Later on he was promoted O.C. to a siege battery ammunition column attached to a 12in. howitzer battery using 120 h.p. caterpillars.



W. S. Fitchett, Sec.-Lt.
R.A.S.C. (M.T.)

THE paper read by Mr. D. S. Heather before the motor cycle section of the Institution of Automobile Engineers at Birmingham, which we reviewed last week, formed the subject of an interesting debate.

Referring to the admitted lack of originality in design, Mr. H. Stevens (A.J.S.) deplored the policy of secrecy which had had such a retarding effect on the trade in the past. This has admittedly been largely removed by the war conditions, but there is still an

Petrol War Tax.

The 6d. per gallon war tax may be removed shortly. The R.A.C. is moving.

Benzole.

A joint Fuels Committee of the Automobile Association, the Royal Automobile Club, and the Society of Motor Manufacturers and Traders, hope to put a proposition to benzole producers which will obviate the necessity of the latter getting rid of benzole to the petroleum companies; that necessity arising in some cases because there is insufficient storage accommodation at the benzole factories and no means to distribute the fuel.

THE DISPOSAL OF ARMY MOTOR CYCLES.

No further development regarding the disposal of Army motor cycles has taken place, and last week's information is the latest obtainable at the time of going to press.

MOTOR CYCLE DESIGN.

element left which it would be better for everyone concerned to abolish. As the chairman, Mr. Lanchester, stated, where there is no originality there can be no progress.

A number of useful proposals were put forward by various speakers, such as for pressed steel chassis, pressed handle bars by the employment of which a great deal of the clip attachment could be dispensed with.

Rustless steel came in for a good deal of comment.



Miss G. K. Carlyon, who has just returned from Roumania, where she was awarded the Order of St. Stanislaus and the St. George's Medal. Miss Carlyon, who is driving the Triumph outfit with Miss Johnson in the sidecar, uses the machine to assist in running a clock factory

Hampshire Roads.

£175,000 is to be spent on the repair of the main roads in Hants.

Exports and Imports.

January imports of motor cycles (consisting mainly of parts) are three times the value of the December, 1918, figures, despite the "prohibition" on imports. The decrease of the January figures for the past three years will be seen from the appended table. The exports for the three Januaries likewise have decreased, more so with regard to machines than in the case of parts and accessories:

IMPORTS FOR JANUARY.

	1917	1918	1919
Motor cycles	£9,192	—	£58
Parts	£7,026	£3,138	£1,325
Total	£16,218	£3,138	£1,383

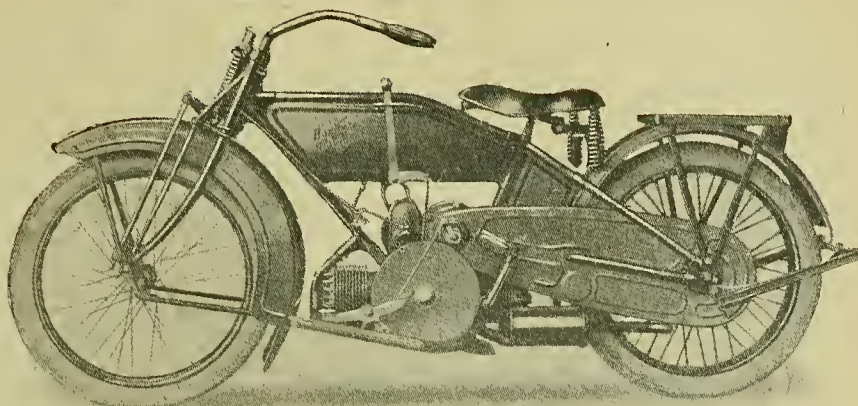
EXPORTS FOR JANUARY.

	1917	1918	1919
Motor cycles	£45,454	£29,454	£13,077
Parts	£33,676	£23,544	£23,224
Total	£79,130	£52,998	£41,301

It was also suggested that the short life of power units was brought about largely by bad suspension in the frame, and through faulty lubrication. This latter could be largely eliminated by taking all oil in through the hollow crankshaft and having distributing ways. Much interest was displayed in the wooden models of frames used to illustrate the paper. These very clearly indicated the results of the various stresses set up in a machine on the road, and made clear the reason for breakages in the down and top tubes.

ANOTHER AMERICAN FLAT TWIN.

The Harley-Davidson 6 h.p.
"Sports"—a Model embody-
ing many Novel Features.



The near side of the new 6 h.p. Harley-Davidson flat twin. The engine capacity is 584 c.c.

lightness. Massive bob-weights are attached to the crank shoulders by means of tapered shanks which pass right through the webs, and are secured by castle nuts. The main bearings are also on rollers, a double set being installed in the latter instance. The outside fly-wheel is built up of pressed steel discs, and to prevent the throwing up of mud, etc., it is enclosed in a neat case.

Valves.

Side-by-side valve construction is adopted, so that they may be operated from the same shaft. One cam operates each pair of exhaust and inlet valves respectively, long pivoted rockers being interposed between the cams and the tappets. A good feature is the screwed-in valve guides, which facilitate replacement. It will be seen from the illustrations that a compact and substantial construction has been obtained by incorporating the gear box with the crank case. The clutch and conventional three-speed H.D. gear are actually above the engine alongside the magneto, the power being transmitted to it by helical gearing, which should ensure noiseless action. The gears, by the way, are somewhat low compared with British solo mounts, being 5:1, 8.3:1, and 13.7:1.

To return to the engine, however, the construction of the exhaust and induction pipes should be noted; these are formed in one casting, so that the induced charge is superheated and better efficiency is obtained with present-day fuels. Their square section also adds to the neat appearance of the unit. A Schebler carburetter is used, with a special air filtering arrangement.

Lubrication.
Engine, gears, and clutch are automatically lubricated by means of a simple adjustable plunger pump, and a hand pump is provided for emergencies. The gear compartment is open to the crank case so that constant lubrication is ensured by splash. A breather hole is drilled in the intermediate gear wheel hub which

acts as a rotary valve, and a pipe leading from the top of the helical gear case feeds oil mist to the driving chain.

Clutch.

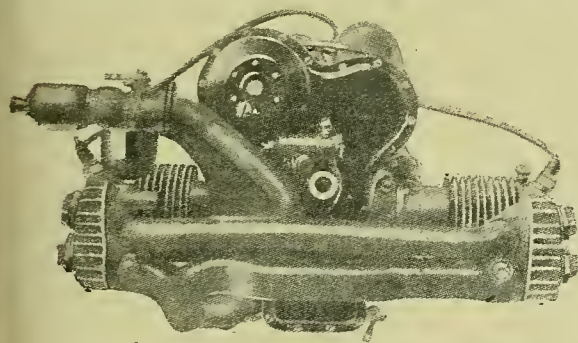
Seven steel plates alternating with six composition insert plates forming the clutch are housed inside the main helical gear, and run in oil.

The final drive is by chain enclosed in a substantial case which has an inspection window. Only one wheel brake is fitted, at the rear, and this is of the contracting band type, 7in. in diameter.

A low centre of gravity has been attained, and yet the ground clearance is ample at 5½in.

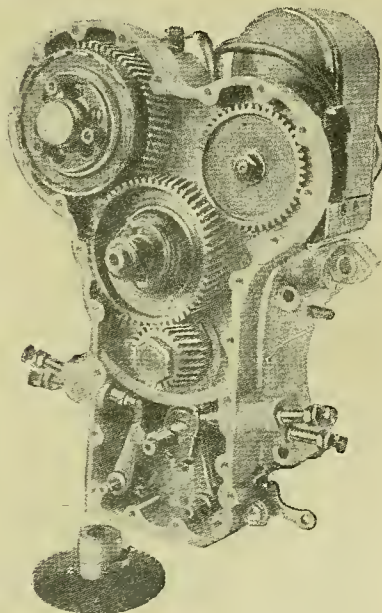
A speed of 55 m.p.h. is obtained, and we should say the machine should prove a good all-round double purpose mount.

We vouch that the performance of this new model will be watched with interest on both sides of the Atlantic. British riders will probably have an opportunity of testing the new machine before the summer is out.



The power unit of the new H.-D. Observe the twin cast induction and exhaust manifolds.

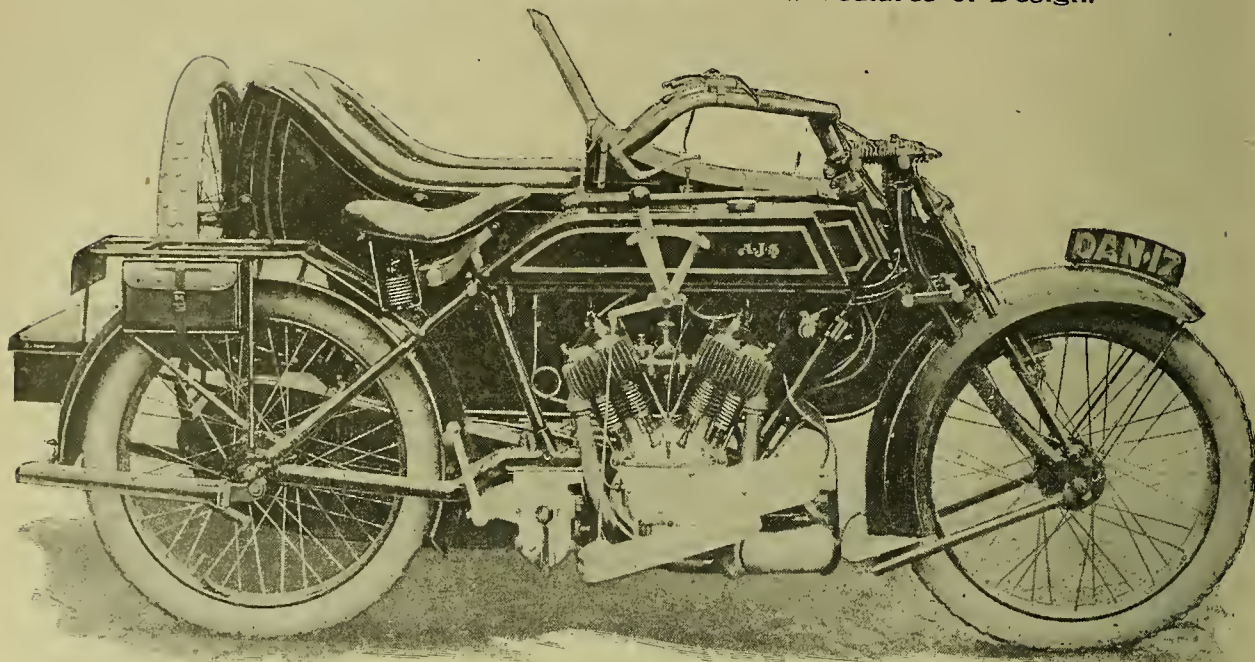
twin-cylinder engine, having a bore and stroke of 69.8 x 76.2 mm. respectively, giving a total capacity of 584 c.c. The cylinders, which are practically in line, owing to the off-setting of the connecting rods on their gudgeon pins, are not provided with detachable heads, but it is arranged so that the valves may be ground in without removing the cylinders from the engine, and the cylinders may also be removed from the engine without taking the latter from the frame. The gudgeon pin bearing is of the usual phosphor bronze bush type, and the big ends house substantial roller bearings, retained by a special steel disc and hexagon nut on the two-throw crankshaft. The piston has three rings, and is drilled in the skirt for



The adoption of helical transmission eliminates the short chains to gearshaft and magneto respectively.

THE PEACE MODEL A.J.S.

A 5-6 h.p. Sidecar Outfit with Several New Features of Design.

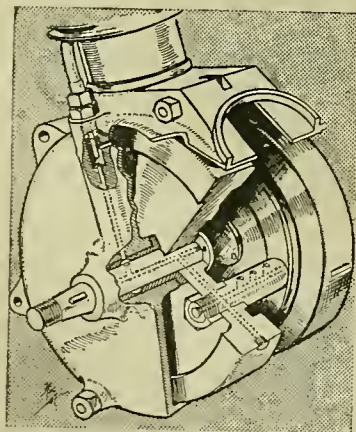


The 1919 A.J.S. 5-6 h.p. outfit. Many improvements have been effected both to the bicycle and sidecar.

It was first announced that the 1919 A.J.S. would be the military model "improved in minor details"; but the sum total of these alterations makes the machine as much a new design as most show models at past Olympias.

The engine, in the main, is the same as that fitted in the military model, with the exception that Messrs. A. J. Stevens have altered the cylinder design, which now embodies detachable heads, a feature of earlier A.J.S. machines, but not of the military model.

A pair of long holding-down bolts and a bridge piece as previously are used to keep the head in position, and, as in the military model, the bore and stroke are 74 x 87 mm. respectively, the total capacity being 748 c.c.



A.J.S. lubrication system, showing drilled oilways leading to the main bearings

Several other alterations are revealed upon closer examination of the engine and its component parts. The cam wheels and their shafts are now made separately, which is the result of many experiments undertaken to produce a silent timing gear. The exhaust valve lifting mechanism has been improved, and consists of two short shafts supported in bosses on the crank case, having fingers on the inner ends in contact with the underside of special discs on the exhaust tappet rods. On the outer ends of these short shafts are long levers interconnected by a stirrup in the more or less conventional way. The Bowden wire adjustment member is carried on a boss in the centre of the crank case.

A third alteration is in the angle at which the exhaust pipes leave the valve chests. They more closely follow the angle of the cylinders, and are fixed by means of screwed unions.

Parallel valve springs are now used instead of the taper type, hitherto standard A.J.S. practice.

Two alterations in the engine equipment which are immediately apparent are the changed positions of the magneto and of the silencer. The former is now in front of the engine and inclined, being carried on a saddle platform resting on two extensions of the forward engine plates. The platform is fixed to the engine plate extensions by means of four bolts, the holes in the plates being slotted, for the purpose of magneto chain adjustment.

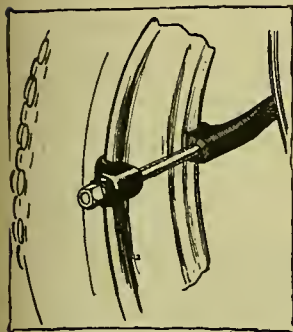
The silencer is a new pattern. It is exceptionally large and constructed of aluminium. It is carried beneath the magneto platform, and forms a support for a neat sheet metal magneto guard.

An Amac carburetter and Thomson-Bennett magneto are standard.

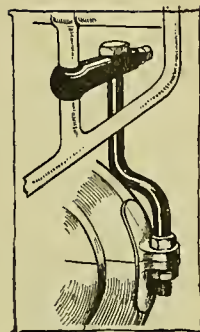
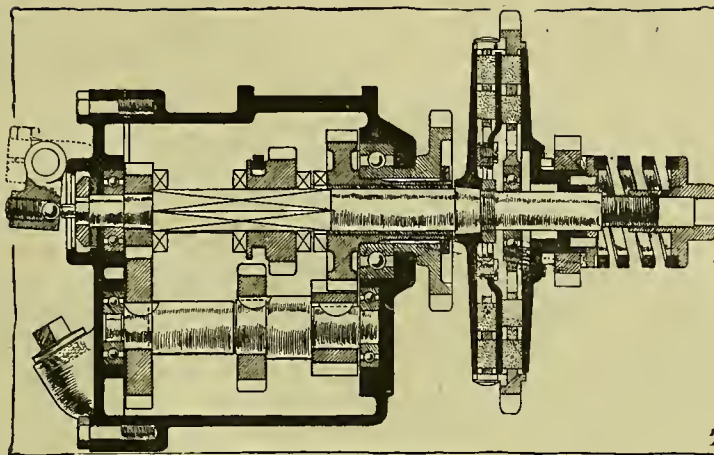
A.J.S. designers do not rely entirely upon the splash system for the lubrication of the engine. The oil is delivered to the crank case through a semi-automatic lubricator, which is located on the tank. On the plunger being depressed, a spring slowly forces the oil into the usual crank case feed pipe, but it does not pass through a sight feed. After passing the union on the crank case, the oil enters a small chamber; part of the oil leaks from this reservoir into the crank case, but the major portion passes down an oil-way to the main bearing on the driving side. The bush of the main bearing is drilled, and the hole com-



A combined luggage grid and locker of ample dimensions is fitted, and the method of holding the spare wheel has been improved



(Left) The method of carrying the spare wheel on the back of the sidecar. The rim is gripped at the sides by neat clamps. (Centre) The A.J.S. gear box, showing



the built-up layshaft and multi-plate cork insert clutch. (Right) The chain case support from the carrier.

annicates with a deep groove surrounding the journal, which is always full of oil. The hole in the journal is connected with a passage through the fly-wheel to the crank pin. On leaving the crank pin the oil descends through the fly-wheel to the main bearing on the timing side.

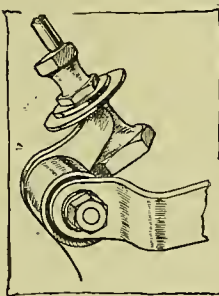
The Gear Box.

Most of the main features of the gear box are retained. It is of the sliding gear type and several improvements have been embodied, including a lay shaft of the built-up type. The drawings given here clearly indicate the salient parts of the unit. It will be seen that an exceedingly big leverage is obtained on the clutch operating mechanism by means of a long lever connected to the end of a shaft which works in a substantial bearing; the other end of the shaft having a short arm for depressing the plunger rod. The clutch is of the multi-plate type, with two plates having cork inserts.

Although differing from the pre-war models in general appearance, a similar design of frame with sloping top tube is used. This, however, is completely hidden by the saddle tank, which covers the tube and follows a horizontal line on the top. The tank is supported on platforms on the lower tube, and is

now enamelled black, with a broad gilt line for decoration, which lends a very handsome appearance to the machine.

Interchangeable quickly detachable wheels, of the well-known A.J.S. type, shod with 700×80 mm. tyres, are fitted, while a spare wheel is accommodated on the rear panel of the sidecar. The method of fixing this wheel is exceedingly neat. Two pairs of small clips are fixed on arms which extend from the sides of the body, and grip the rim of the wheel. By loosening two nuts the wheel is quickly removed, but when in position it is held rigidly.



The newly designed exhaust lifter.

A feature of the sidecar is the luggage carrier, which is supported on the body and therefore sprung. It is of triangulated design, and constructed of pressed steel, with a wooden platform covered in sheet rubber. Beneath the platform there is a commodious locker.

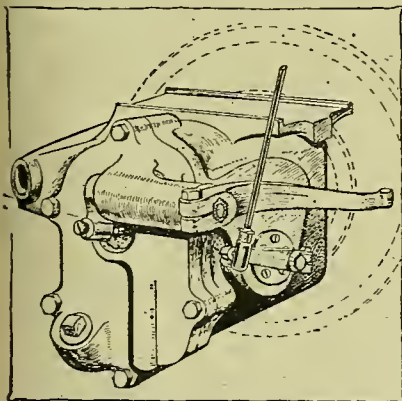
The sidecar, the panels of which are of sheet steel, is particularly handsome

and capacious. It is fitted with a hinged dash, carrying the screen, which it brings well to the rear.

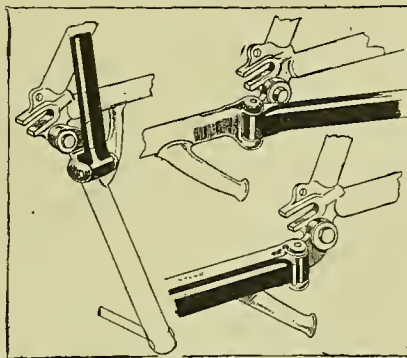
Other improvements include the enamelling of the handle-bar in lieu of plating, while the control wires are taken through the bar, which removes a point of complaint frequently heard against all machines with the many Bowden wires clipped to the bar.

Probably one of the most interesting features of the new model is the rear stand, which is a successful attempt to reduce the strain upon the rider in raising the machine on to the stand.

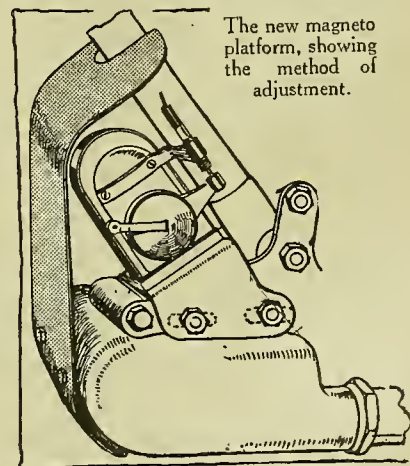
This device is extremely simple, and consists of an oval section lever hinged to the side of the stand member near its inner end. When not in use this lever lies along the stand tube to which it is clipped. When it is desired to raise the machine on to the stand, the lever is swung round towards the engine, a stop providing the correct angle; then, with the stand on the ground, the lever is pulled upwards, and the machine raised with comparative ease. Readers will agree that Messrs. A. J. Stevens are to be commended for giving this matter, so often referred to in *The Motor Cycle*, the attention it deserves, as it was practically an impossibility for the average man to raise a big twin sidecar machine on to the stand unaided.



The clutch operating lever is exceptionally long providing ease of manipulation.



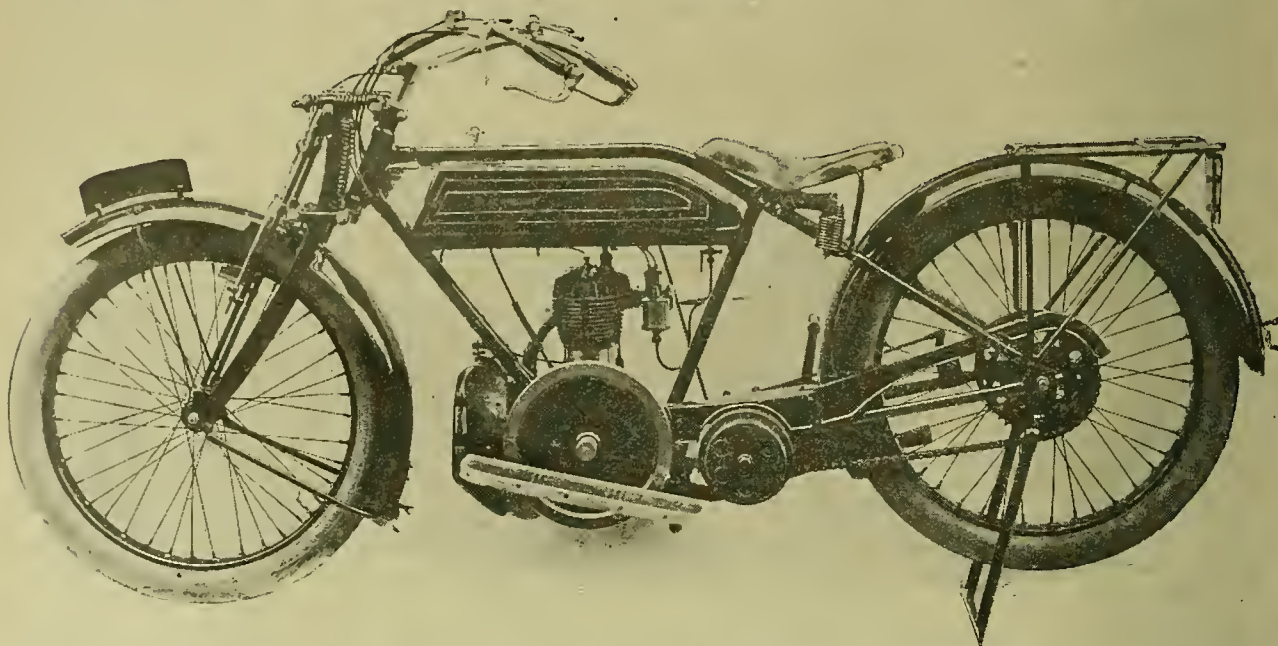
The patent stand lever by which the difficulty of raising the rear part of the machine is removed.



The new magneto platform, showing the method of adjustment.

THE 3½ h.p. BLACKBURNE.

An All-chain Driven Mount with Single-cylinder Engine of 85 mm. × 88 mm. = 499 c.c.



THE new Blackburne is a worthy successor to the previous models of this make. The improvements are by no means startling, so far as mechanical design is concerned, but they are of such a nature as to enhance the appearance of the machine.

In the Blackburne engine itself there has been little alteration. As is well-known, the 3½ h.p. has an outside fly-wheel, a solid crankshaft with separate balance weights, and a car type of split big end bearing. By means of a system of oil channels, the ordinary splash method of lubrication has been made perfectly satisfactory, and the oil level is

maintained in the crank case through a Best and Lloyd sight feed lubricator.

For 1919 a Thomson-Bennett chain-driven magneto has been fitted, which is protected by a suitable guard.

The transmission is by chains, also protected by guards, but in future models they may be entirely enclosed.

Considerable attention has been paid to the design of the gear box, which is of the sliding pinion type, and is provided with an inspection plate, which also facilitates the introduction of lubricant.

The clutch is of the three-plate variety with cork inserts, and, owing to an excellent system of leverage, handle-bar control can be easily adapted. The kick starter mechanism is entirely enclosed, one stroke of the lever giving two and a half revolutions of the crankshaft.

All the frame tubes are straight, with the exception of the heavily reinforced top tube which is curved. The tank is particularly neat, and will hold two gallons of petrol and a quart of lubricating oil. The lubricator and filler caps, which latter are of large dimensions, are carried on one side so as to simplify the removal of the tank.

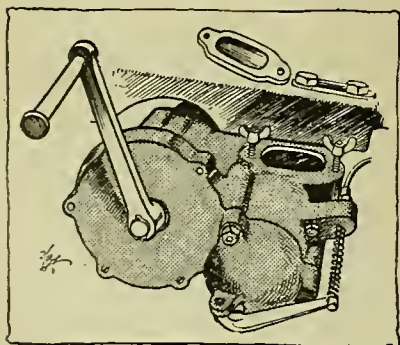
The mudguards are of ample width, and a small valance is fitted at the base of the rear guard to prevent mud being thrown on to the chain. The front brake is the latest pattern Bowden rim type, while at the rear an external contracting brake, lined with Ferodo, is embodied, which is provided with a remarkably

simple and effective means of adjustment.

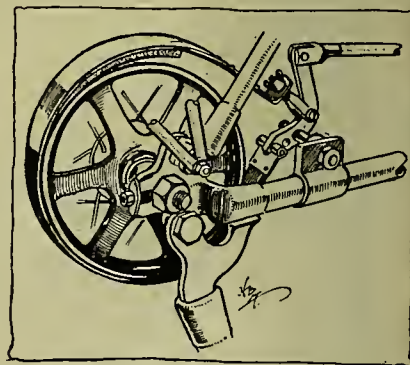
28in. × 3in. tyres are fitted, and the wheel spindles are withdrawable. The equipment includes Brampton forks, footboards edged with aluminium, a strong tubular luggage carrier, toolbag designed to be attached to the top tube, and rear and front stands. The latter, when not in operation, forms the mudguard stay.

The wheelbase is 4ft. 1in.; height of the saddle from the ground 2ft. 5½in.; flywheel ground clearance 5¼in. The weight is 250 lb.

From its solid construction, its excellent finish, and sound design, the 1919 Blackburne should find favour with a large coterie of solo riders at home and abroad.



Kick-starter, showing inspection cover of the gear box removed.



Rear band brake of the new Blackburne.

The latest adherents to the Motor Legislation Committee are the Auto Cycle Union and the Association of British Motor and Allied Manufacturers.

Practically the first item on the programme of the Committee is the opposi-

tion to the proposed Bill shortly to be introduced to constitute the new Ministry of Ways and Communications. The matter is an urgent one, for unless the Government's intentions are altered the roads will be placed under the control of

men who are naturally in favour of railways. That our roads should be in the hands of railway men would be contrary to the interests of all, and the Road Transport Committee must see that this is altered before the Bill is introduced.

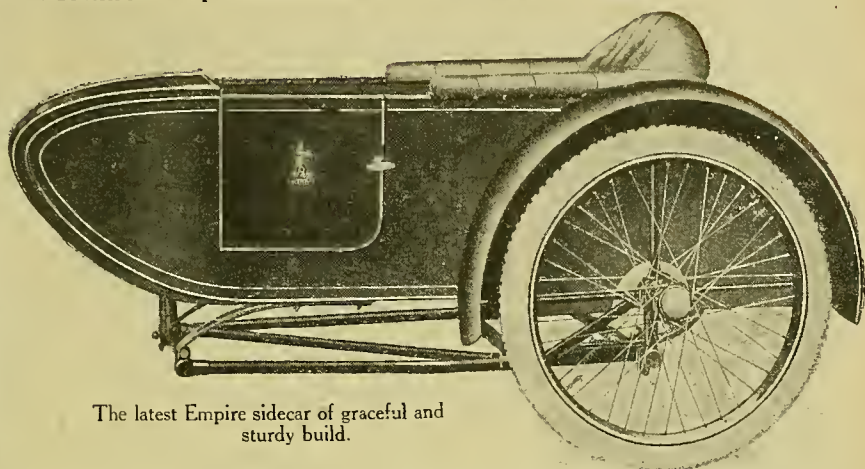
A MILITARY MODEL SIDECAR.

A Sidecar to Government Specification for Private Owners.

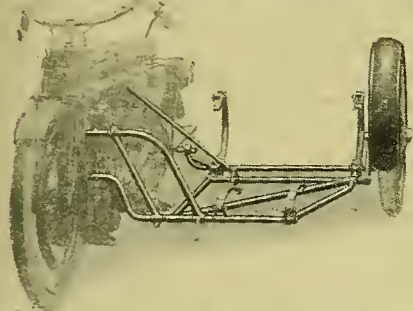
THE Empire sidecar is not so well known to the riding public as it is to large producers of sidecar outfits. Before the war the bulk of the Empire output was absorbed by trade requirements, and during hostilities several thousands of them were supplied to the Government for Triumph and B.S.A. machines. From this it will be gathered that Messrs. Lowe's Empire Sidecar Co., Ltd., has a larger output than is usually realised.

At the time of our visit to the Empire Sidecar works last week we saw several hundreds of these vehicles in stock which were awaiting instructions for delivery. The Government has not entirely released the company to resume their normal business, but have sanctioned their making a certain number for the public.

The military model sidecar is built under a patented process, all panels being



The latest Empire sidecar of graceful and sturdy build.



The new chassis design of the Empire sidecar. Four-point attachment is adopted, the two front supports being connected with a supplementary arm.

of special hydraulically-pressed close annealed steel, which, incidentally, makes a totally different proposition from the usual sheet metal body. The design is most pleasing and the general finish considerably above the average. The seat and back are double sprung, while the "trimming" on the sides and tops is well carried out; in fact, throughout, the sidecar is built for hard service. There are the usual large tool-chest under the seat, and side pockets for maps, etc.

The Chassis.

Designed specially for W.D. B.S.A. and Triumph machines on active service, the chassis is particularly sturdy in construction. At every point this is in evidence,

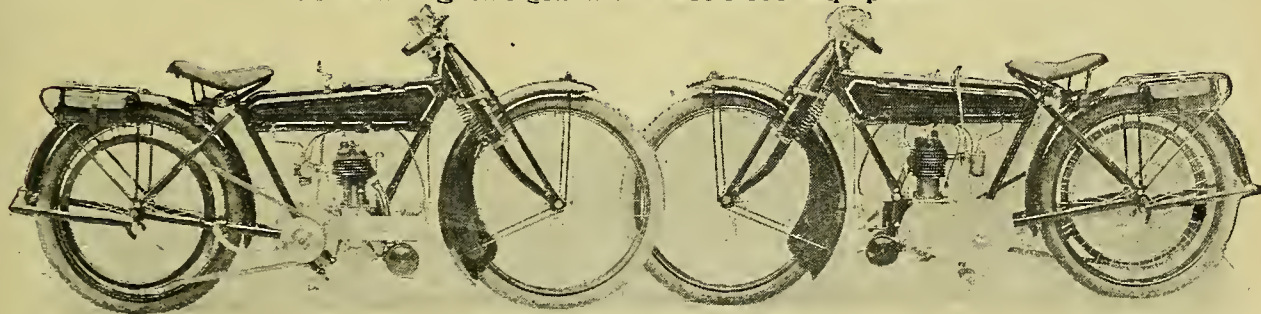
as will be appreciated by an examination of the photograph reproduced. The wheel is extra strong, with 10 gauge spokes, built on a wide dustproof hub, which has a knurled cap. All lugs are cast with webs, and the shackles are castings with oilers and gunmetal bushes. The springs are connected by shouldered bolts, so that it is impossible to tighten the nuts up against the edges of the springs. A well-stayed 5in. guard with full valance is fitted.

In every way the military model Empire is a first-class sidecar, and one which can be quickly attached and detached.

The makers are Lowe's Empire Motor and Sidecar Co., Ltd., Empire Works, Birmingham.

THE 1919 DIAMOND-JAP.

A New Lightweight with First-class Equipment.



Near and offside views of the new J.A.P.-engined lightweight Diamond o. 2 1/4 h.p.

THE D. F. and M. Co., of Wolverhampton, are the makers of the interesting shaft and chain-driven Diamond, but for the present they cannot proceed with the manufacture of this model, and are concentrating upon two-stroke and J.A.P. engined lightweights. The latter machine is a new model, and is now illustrated.

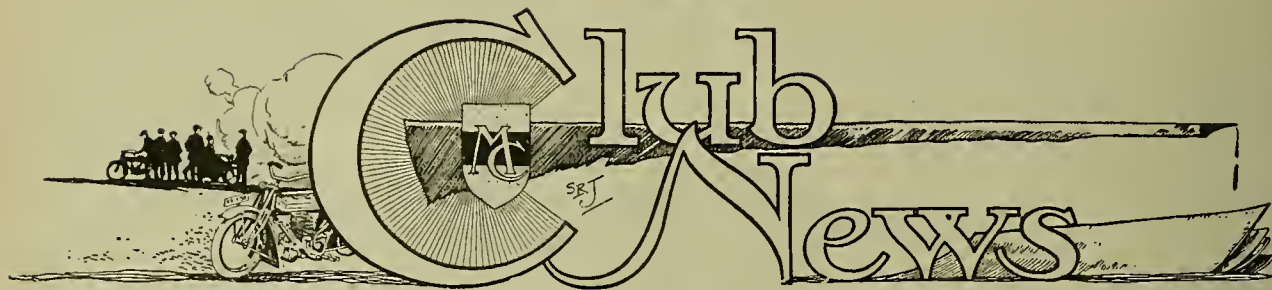
As will be seen from the photographs the engine fitted is the small single-cylinder J.A.P. with chain-driven mag-

neto at the front of the unit. The bore and stroke are 70 x 76 mm. respectively (292 c.c.).

An Enfield two-speed gear is the standard gear on this model, which is contained in an aluminium oil bath chain case, which also encloses the operating mechanism.

In producing this model the makers make no attempt to compete in price with other assembled machines which are

similarly engined, but have endeavoured to produce a lightweight first-class at every point. 26 x 2 1/4 in. extra heavy Dunlop tyres, Brooks B150 saddle, best class Bowden fittings, British-made variable magneto, Druid D.W. forks, Dunlop belt, Senspray carburetter, high quality toolbags, and well equipped tool roll are items of the specification. The makers' address is Vane Street, Wolverhampton.



The A.C.U.

As we have already stated, a travelling representative is to make an inspection by the variously appointed and proposed hotels and repairers. A Morgan Runabout has been purchased by the A.C.U. for his use.

It is hoped to be able to establish local consuls in all the principal towns in the United Kingdom. These consuls should be motor cyclists, preferably of some engineering experience, who are not directly interested in the trade, who will give advice to beginners, act as stewards at local trials, and generally represent the interests of the A.C.U. and its members. Readers who feel qualified to act in this capacity are invited to write to the secretary, Mr. T. W. Loughborough, The Auto Cycle Union, 83, Pall Mall, London, S.W.1.

Surrey M.C.C.

It is not likely that this club will be restarted as yet, owing to most of the members being still in the Forces, and there are no signs of their being demobilised at present.

The Cyclecar Club.

The Cyclecar Club A.G.M. is fixed for March 24th, at the Royal Automobile Club, when the officers and committee will be elected. It is also proposed to alter the title to "The Junior Car Club."

Bolton and District M.C.

A successful opening meeting was held on the 13th inst., and the officials elected. The committee intend to hold a dinner at an early date at which some prominent speaker, probably an A.C.U. representative, will be present, as a recruiting measure among the local motorists. Intending members should send their names and subscriptions (5s. 6d., including affiliation fee to A.C.U.) to the hon. secretary, Mr. J. E. Whittaker, 205, St. George's Road, Bolton.

Italian Clubs.

The paper *La Gazzetta Dello Sport* has organised a long-distance trial, to be run in May, from Milan to Naples—about 530 miles.

The Moto Club Torino is holding a reliability trial over the Alpine pass Colle di Sestriere and a hill-climb. A reliability trial for Italian machines only, distance about 220 miles, has been arranged for the third year by the Sport Club Milan. Details of these events will be published later. The annual general meeting of the Italian Auto Cycle Union (Moto Club d'Italia) was held at Milan on the 23rd inst.

Club Dates.

MEETINGS.

- Mar. 4.—Essex M.C. A.G.M.
Mar. 21.—M.C.C. Smoking Concert.
Mar. 22.—A.C.U. (Birmingham). G.M.
Mar. 24.—The Cyclecar Club. A.G.M.

EVENTS.

- Mar. 2.—Woolwich, Plumstead and Dis. M.C. Opening Run.
Mar. —Ealing and Dis. M.C.C. Opening Run.
April 5.—Birmingham M.C.C. Opening Run.
April 5.—M.C.C. Opening Run.
April 18.—Darlington B. & M.C. Opening Run.
April 21.—Birmingham M.C.C. Easter Tour.
April 21.—Liverpool M.C.C. Opening Run.
April 21.—Dublin M.C.C. Dunlop Cup Trial.
June 9.—Dublin M.C.C. Whit-Monday Trial.
June (end of).—Dublin M.C.C. Twenty-four Hours' Reliability Trial.
Aug. 2 & 4.—Dublin M.C.C. Two Days' Reliability Trial.

Matlock and District M.C.C.

As the majority of the old members of this club are serving with the Forces, it has practically become extinct. Here is a chance for some local enthusiast to organise a live sporting club.

Cumberland County M.C.C.

We hear from the treasurer, Mr. W. B. Anderson, West Walls, Carlisle, that as most of the members are still in the Army, nothing has yet been done towards re-forming the club.

Wakefield M.C.C.

It has been decided to re-open this Club, which was closed down "for the duration," and an attractive programme is being arranged. About twenty new members have been elected already. The hon. secretary, Mr. S. E. Wood, 186, Stanley Road, Wakefield, will be glad to hear from prospective members and others interested.

We shall be pleased to hear again from secretaries and others regarding existing and proposed clubs, their programmes, and any other interesting particulars. We are prepared to assist with advice and publicity those desirous of establishing clubs.

The M.C.C.

The largest and most important smoking concert ever organised by the Motor Cycling Club will be held at the large Queen's Hall (which will hold between 1,500 and 2,000 people) on March 21st. A number of first-class artistes will be engaged, and those who intend to be present may look forward to a most enjoyable evening.

Members of the M.C.C., and of other motor cycle clubs, may invite their friends and lady friends. Tickets may be had on application to the secretary, Mr. Southcomb May, 15, Endsleigh Gardens, London, N.W.1.

Those who intend to join the M.C.C. are reminded that they will be admitted on election and on payment of 5s. entrance fee, and that no subscription will be asked for until competitions begin. The subscription will in no case exceed £1 1s. Candidates for election must be proposed and seconded by two members, one of whom must be a member of the Committee, or provide two references.

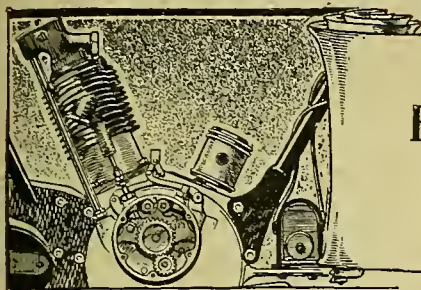
A Labour Motor Cycle Club.

We hear of a new motor cycle club in formation in South London in connection with a Labour club, composed of engineering trade unionists and others.

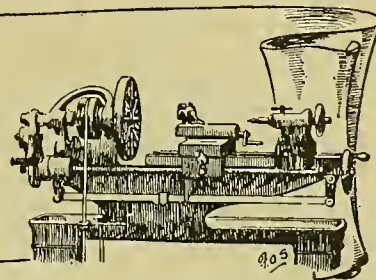
The N.M.C.F.U.

Outings of the Sheffield branch have been arranged for March 2nd, Eyam, Grindleford; March 9th, Hathersage; and March 16th, Bawtry, Blythe.

At a meeting of the Coventry Branch, attended by about 250 of the members, Mr. Torkington, the chairman of the Union, in the unavoidable absence of the secretary of the Benzole Association, gave a report on the workings of this organisation, and also its specification of benzole which had been adopted as a standard. An appeal was made to all motorists to support this home production. He also touched on the proposed new Ministry of Ways and Communications by asking motorists to support the following resolutions: "(1) This meeting of executives and delegates of the National Motor Cyclists' Fuel Union, realising the superiority of rail-free road motors over any partial or extensive system of light railways, places on record its strong opposition to any legislation which will put railway interests in control of roads and road transport; and (2) all present pledge themselves to take the necessary action to warn their labour organisations that such railway control will be unfair, and will hinder independent national development of road traffic, preventing reductions in the cost of food."



PREPARING FOR THE ROAD.



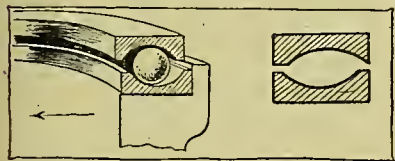
Points to which Attention should be given on an Old Machine.

NINETY per cent. of the breakdowns and petty annoying stoppages that occur on the road are the result of neglect or ignorance on the part of the rider. One has only to purchase a second-hand machine now and then in order to realise this—to realise, further, the appalling lack of adjustment motor cycles have to put up with in the hands of the average amateur. How it is that breakdowns are so infrequent as they are is somewhat of a mystery, for there are thousands of men on the road who seem incapable of realising that they have a cycle to look after in addition to a motor. The modern engine is more or less infallible, requiring little attention, except for the controls, and thus, having purchased a second-hand machine, the power unit is probably as well left alone, but the cycle parts should be subjected to a most searching examination before any long distance runs are tackled.

In the first place, the wheel bearings are never in order, and on being taken adrift, as they should be straightaway, it is more or less probable that one or two broken balls will be found. After the cones have been cleaned and the bearing put together with its full complement, the hub should be packed with vaseline, and it will then require no further attention for the remainder of the season. Do not use stiff grease, for this is apt to stand aloof from the bearing, which ultimately dries and becomes foul with grit; consequently another breakage will soon occur.

Watch the Steering Head.

Few riders realise how great are the strains thrown upon the steering head when a sidecar is attached, or



Section of a steering head ball race, showing the position it assumes when the races are out of adjustment.

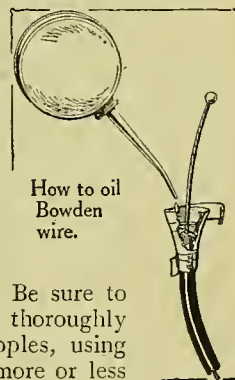
to what extent the comfort and safety of the solo rider is involved in its proper adjustment. Steering heads are things people frequently forget, and riding with a

loose adjustment they very soon ruin the bearings, in which case it is impossible to obtain proper steering till they have been renewed. It is, moreover, dangerous to ride with the steering head bearings out of adjustment, and, having taken the bearings to bits—by no means a difficult business—it is thoroughly worth while to renew the cones if they are at all rough or unevenly worn. At all events, the balls should be

renewed if there is any sign whatever of wear, though if the cones appear to be very little worn they can be turned round so that the maximum pressures fall on the least worn parts. A glance at the accompanying sketch shows what position the steering head bearings assume when the races are out of adjustment. If the front brake is applied the bearing is thrown violently into this position, which completely upsets the rider's control, and sooner or later either balls or races or both will be sure to break.

Attention to Controls.

Old Bowden wires are not worth troubling about, as they are a cause of endless annoyance and loss of time, though if the outer cases are good it is necessary only to purchase new inner cables, which are cheap. If the cables look worn and the strands have separated, renew them by all means, as it is only a simple soldering job, costing a shilling or two, and you are then sure of a year's riding free from control troubles, which are among the most irritating. Be sure to grease the inner cable very thoroughly before soldering on the new nipples, using some stiff grease which will be more or less permanent.



If the wires are sound, but rusted by lack of usage, the strands will break almost at once unless given attention. Take the cables off the machine, remove the wires and soak them in paraffin until quite clean and replace them, then run engine oil into the casing by making a tiny cup of insulation tape at the end of the casing, as shown in sketch. The oil can be dropped slowly into this cup, and it will then drain along the cable, the wire being pulled backwards and forwards now and then to work it through.

The tractability, fuel consumption, and general good behaviour of a machine are largely dependent on the proper working of the controls. Not only should the wires be free and well lubricated, but the return springs inside the carburettor should not be so strong that it is necessary to have the handle-bar lever adjustment screwed up tightly. The levers should move either way to the slightest pressure of the forefinger, and, provided the wires are perfectly free, very light return springs can be used. It is surprising how heavily these small points weigh in the handling of a machine, and I remember a friend of mine asking me

Preparing for the Road.—

to tune up his P. and M., which was "not going well." All I did was to free the carburetter controls, leaving them working as they should, and his later remark was to the effect: "Whatever you did, it has made a marvellous difference."

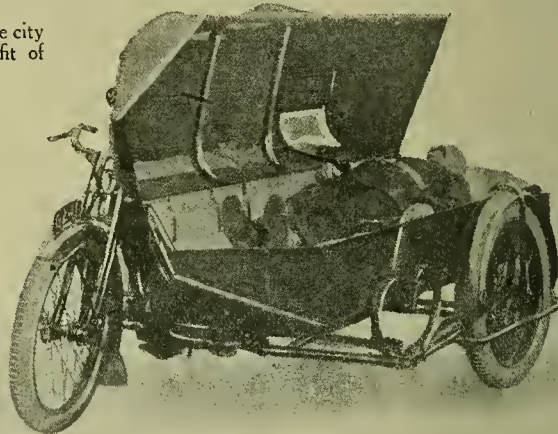
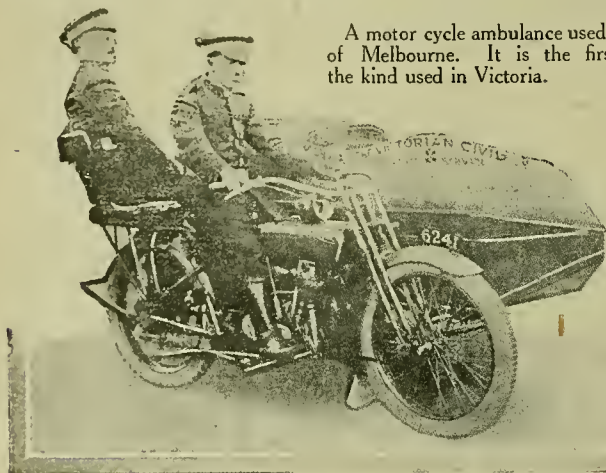
Tyre Precautions.

Do not forget the tyres. Probably you will find that water is getting into them, with the result that the rims are rusted inside. You will soon be troubled by old patches coming off or something of the kind if you use them in this condition, and the best plan is thoroughly to sandpaper the rims, then paint them. If this suggests too much trouble, renew the leather washers at the valves and security bolts (if any), and see that the lock-nuts are screwed thoroughly home on

to the washers. The slackening off of these nuts and the resultant entrance of water is a common cause of tyre breakdown.

There must be scores of riders who are now, or will very shortly be, taking out old machines, and it is thoroughly worth while to decide to spend a day or two tinkering before sallying forth. If a machine is ridden out of adjustment the trouble is rapidly aggravated, and many a good mount is reduced to a state of unreliability in the course of two or three years of neglect, when, with discriminate use, its life might easily have been trebled. I have in my possession now a six-year-old machine which has 56,000 miles to its credit, including two years of the most strenuous competitions, but which is as perfect in control and every bit as reliable—and almost as fast—as new machines from the same factory. CHINOOK.

A motor cycle ambulance used by the city of Melbourne. It is the first outfit of the kind used in Victoria.



Refinements or Small Cost?

A Plea for a Low-priced Mount shorn of Refinements.

WHICH are we to be given—refined motor cycles or cheap motor cycles? At present, production in the motor cycle industry seems to be solely devoted to models of novelty and refinement. Refinements increase while initial cost is neglected. Do manufacturers appreciate that there are two markets, of which the buyers of a cheap machine, if produced, are by far the greater in number, and yet at present they cater almost solely for the buyer of the refined motor cycle?

Reliability has come and come to stay. Now let us have cheapness. We hope and trust that manufacturers will not neglect this vast, untapped market. Let them add to the present reliability the vital necessity of cheapness, and they will find that the market is both lively and large. Surely they can see what success the Ford car has obtained from cheapness and reliability.

With labour and materials at high prices, manufacturers cannot give reliability, cheapness, and refinements in one machine. They can give us the first two in one machine, for the war has taught them the price lowering effect of quantity production. There are thousands of men and women having aspirations to a power-mount, but without the means to meet the present cost. On the other hand, the

minority who have the means and value refinements above initial cost are always in a position to gratify their desire. "Money talks," especially when laid out in a series of "gadgets." But the bulk of potential motor cyclists do not desire gadgets and novelties. They want a cheap machine of reliable quality in order that they may *ride*.

What of the Future?

Reconstruction must not return manufacturers to the "rut" of pre-war days, the "rut" in which they yearly added to the number of novelties. Let us hope that they reconstruct their works so as to cater for the two markets.

Of the two uncertainties, the future cost of fuel and the future cost of motor cycles, the former is far more likely to be lowered. The motoring classes are clamouring for this, but the potential buyers of cheap machines, although larger in number than existing motor cyclists, have no voice. They are waiting.

Will their waiting be suddenly ended by British manufacturers, or will British manufacturers let the American makers come to this country with a cheap motor cycle as they came with a cheap but very efficient car? RACH.



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hartford Street, Coventry, and must be accompanied by the writer's name and address.

A SUGGESTED UNION.

Sir,—Might I suggest to M. Hitchcock that he communicate with Mr. W. Ellis, 70, Abingdon Street, Derby, the general secretary of the National Motor Cyclists' Fuel Union—a union formed for the purpose of doing exactly as he suggests, and which has already a large number of members which is increasing very rapidly. The subscription is a nominal one of 2/6 per annum with 1/- entrance fee, and four meetings are held in large industrial centres each year. We have successfully fought the cause of motor cyclists in the past, and can assure Mr. Hitchcock he can save his subscription on the first few gallons of fuel purchased through the N.M.C.F.U. W. WRIGHT.

Sir,—Will you please allow me, through your paper, to reply to M. Hitchcock re "A Suggested Union." In the first place there is a union in existence—a real fighting organisation (as will be proved in the near future), known as the National Motor Cyclists' Fuel Union, with branches in every town. It is composed of working men, and intended to look after their interests. The union is there; what is wanted is for motor cyclists to join, and so provide the force to fight. The more we have, the more ideas we have to work on, and, speaking for the Executive, the more work we have the better we like it. The N.M.C.F.U. is affiliated to the A.C.U., and these two unions are prepared to go the whole way.

T. MALLALIEU,

Honorary Secretary, Coventry Branch.

CYCLE CARS.

Sir,—The chassis lay-out of the new G.N. cycle car in your issue of the 13th is interesting, and appears to be a step in the direction of simplified construction on purely car lines. I am wondering, however, how the true alignment of the chains will be affected, (a) when one rear wheel passes over a large obstruction, e.g., a brick, and (b) when the car is occupied by the driver only, and he a man of at least moderate weight. In either case it appears from the drawing that the rear axle will be deflected out of vertical

alignment with the countershaft, or *vice versa*, and would undoubtedly result in undue strain on the chains and wear of the teeth of the sprockets.

Also a rigid drive in conjunction with a solid back axle involves the slipping of at least one of the rear wheels on corners. Will not this tend to excessive tyre wear?

Perhaps the makers will shed a little light gained from their practical road tests of the vehicle on these points which appear to be the only blots on an otherwise highly creditable design.

F. E. SCHOFIELD.

HIGH GEAR RATIOS.

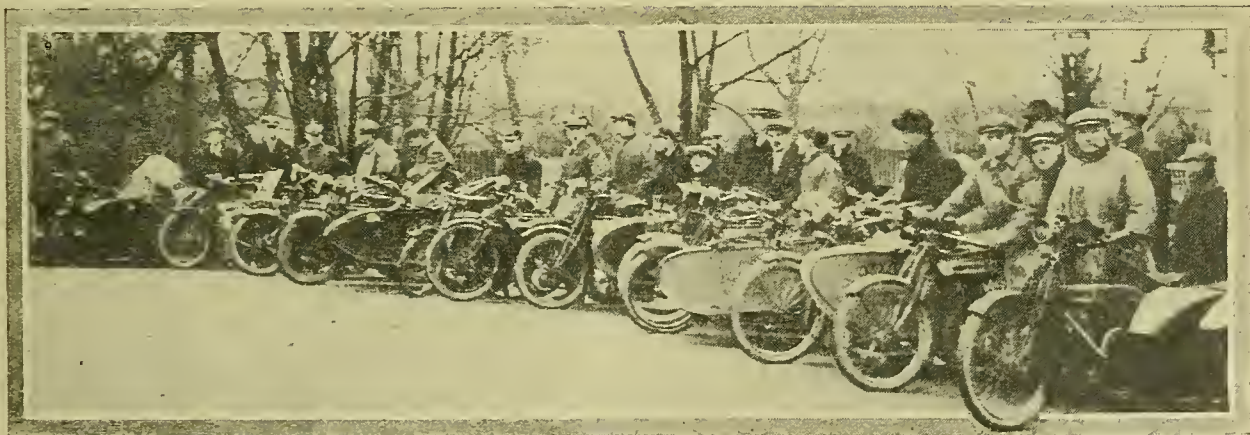
Sir,—I notice that in *The Motor Cycle* of Feb. 13th, "Ixon" refers to the gear ratios on Zenith machines.

I do not, however, quite understand what is meant by the opening phrase of the paragraph, as there is apparently no challenge as far as our machines are concerned. We recognised that a 7 to 1 bottom gear was not sufficient for sidecar work or for the type of rider mentioned, and therefore the countershaft model was designed to meet this difficulty, as is stated in the paragraph referred to.

Consequently, we make two types of machines, one of which we call the standard type (on account of its being the original pattern as regards gearing), which is for the sporting fraternity for whom a 7 to 1 gear is amply low enough, and another type with the lower gear ratio called the countershaft clutch models.

The standard models have a direct drive from the engine pulley to the back wheel so that there is no loss of power owing to transmission through a gear box, and also we submit that, owing to the fact that with the Gradua gear the rider does not have to drop suddenly from one gear to the next, but can, by reducing his gear slowly, keep up the efficiency of his engine during the whole time that he is climbing a hill, there is not the same necessity for a very low bottom gear as there is on a machine of the three or four speed type, where you not only have to reduce the gear by definite steps, but also lose a certain amount of momentum of the machine during the actual period of changing gear.

F. W. BARNES, N.I.A.E.



The meeting of the Birmingham and Coventry branches of the National Motor Cyclists' Fuel Union at Stonebridge last week-end. Many new machines were in evidence and freely criticised.

LOSING ONE'S PROP.

Sir,—My attention has just been drawn to the letter from "Revs." in your issue of Feb. 13th. He asks me to name any stationary engine which a pilot can restart by diving after losing his prop. In reply, I should be much interested if "Revs." can name any engine of any service type with which this is *not* possible, assuming, of course, that the engine is in a condition to be started. **TORQUE.**

BENZOLE.

Sir,—It seems obvious that with the cessation of hostilities various attempts are being made to induce gas companies to stop scrubbing their gases for benzole.

It cannot be too widely known that this, to us, vitally necessary process involves so slight an alteration in the calorific value of the gas as to be almost negligible.

Over six million gallons of rectified benzole were produced in gas works throughout the country last year. You will agree that this is far too important a contribution of motor fuel for the national needs to be allowed to disappear. I venture, through your columns, to appeal to every motorist who may be in a position to help us in any way in this matter to communicate with me.

It is strongly felt that not only should the existing companies receive every encouragement to continue their efforts in this direction, but also that the thousands of tons of coal at present being carbonised and the gases left unwashed should also be treated for the national advantage.

STENSON COOKE,

Secretary, The Automobile Association and Motor Union.

PRICES—STATEMENT BY THE MANUFACTURERS' UNION.

Sir,—At a representative meeting of members of the Motor Cycle Section of this union, articles and letters recently appearing in the press, relative to the present and future prices of motor cycles, were fully discussed.

The opinion was quite unanimous that motor cycle prices, in the immediate future at all events, are much more likely to increase than to decrease.

The opening of the season compels manufacturers to fix list prices, in spite of the uncertainty of costs. The unstable material and labour costs render the fixing of definite prices a matter of great anxiety, and manufacturers, in their desire to keep those prices within reasonable limits, are running quite considerable risks.

It would be quite safe to say that present catalogue prices, relative to present factory costs, are much more favourable

to the purchaser than was the case in pre-war days, and yet manufacturers have to face the possibility, amounting almost to a certainty, that costs will be yet higher.

ALF. BEDNELL, General Manager,
The Cycle and Motor Cycle Manufacturers and Traders
Union, Ltd.

IS A CONTRACT BINDING?

Sir,—On page 168 of Feb. 13th, you reply to an enquirer who has paid £5 and wishes to be released from his contract to purchase. What about the other side? Surely it is equally binding on the seller.

On Jan. 1st I ordered a well-known sidecar combination at £115 from a local dealer, taking a receipt for £5 deposit, the outfit to be ready on Feb. 15th, but on calling for it delivery was refused unless an additional £10 was paid, a letter received from the makers on the previous day being shown as the cause of the increase. Protests were bluffed, I could do as I liked, but I should not get it unless the higher amount was paid, and rather than have any further bother I accepted the return of £5. What should be done if I meet with no better treatment elsewhere?

Is it a "custom of the trade" to quote one price and sell at a higher? If so let us beware "Waiting Lists."

A SCRAP OF PAPER.

FOUR-CYLINDER MOTOR CYCLES.

Sir,—When, I wonder, will a British manufacturer market a four-cylinder, shaft-driven, motor cycle as good as the F.N.? I say "as good" advisedly, because if he will make one that is truly "as good," it will be an excellent machine. Without stopping to discuss the points of F.N. design, which were capable of obvious improvement, as an F.N. rider I note with regret your pessimistic reports concerning the factory at Liège. But I hope yet that we shall see the F.N. concern revived. Many thousands of miles on a 5 h.p. F.N., with its tiny engine and despised automatic inlet (which, by the way, never gave the slightest trouble), leave me hankering only for the more powerful 7 h.p. type, which had hardly got upon the market before the crash came. That the F.N. has its own "little ways" I am well aware, but it was a worthy representative of a type which is years ahead of anything else on the market. I cannot imagine any rider who has experienced the merits of the four-cylinder engine and shaft transmission taking kindly to any other type yet in sight. Oh! for a good British four-cylinder, shaft-driven machine.

FOUR-CYLINDER ENTHUSIAST.



Indian sidecar outfits out on test. This gradient, on which many Indians are tested, is on the way to Wilbraham Mountains, and rises about 1 in 6.

MAGNETO POSITION.

Sir,—Regarding M. Hitchcock's remarks on an ideal side-car machine, and the position of the magneto behind the engine, with the contact breaker on the right-hand side of the machine, which is to his mind the correct place and way. I should like to say that this is standard practice on Dene chain-driven machines, and has been so since 1914.

JAMES R. MOORE.

Dene Motor Cycle Co.

A TABLOID HISTORY OF AIR-COOLING.

Sir,—I have followed with interest the article by "Road Rider" on the application of aero engine design to motor cycle engines, which was published in your issue of February 13th. I cannot agree, however, with his statement that "the rotary engine's inlet valve must feel like a fat pug chasing the ghost of a rat round Trafalgar Square." Now, sir, I have handled some hundreds of rotary engines of all classes in the past four years, both on brake test and under ordinary flying conditions, and have never found that one of their faults, which I allow are legion. The mixture is flung up the inlet pockets by centrifugal force, and the supply is always ample if the engine is properly looked after. One other point which does not quite tally with my experience is the statement that a rotary (and the engine in question was either a 50 h.p. or 80 h.p. Gnomé) throws out two gallons of very good and expensive oil every hour. Assuming that two-thirds of the oil used is thrown out through the exhaust valve, the total consumption is three gallons an hour. I can name a 120 h.p. rotary that uses one and a half gallons an hour, of which about a gallon would be thrown out and wasted. To conclude, I venture to say that until an efficient engine is designed to outdo the rotary for lightness and overall dimensions, the day of the rotary is not "gone for ever."

G.C., Flight-Sergeant, R.F.C.

WANTED, WEATHER PROTECTION.

Sir,—Having had six to seven years' experience of motor cycles, I am now thinking of purchasing a car.

I am, like many others, often set car-longing by the liberal mud bath one receives whilst using a motor cycle in bad weather. One of my present machines is fitted with winter mudshields, in spite of which, using the machine daily, most days this winter I return home with a most liberal coating of mud and water, from the knees downwards. All machines I have used seem the same. Cannot makers do something for us riders *re* weatherproof machines?

To return to the subject, I hesitate to change to a car, as I am doubtful of finding anything, short of the Rolls-Royce type, that will cover the ground like a powerful motor cycle, or which will climb hills without a lot of second or low gear work. I should think it a great change for the worse, if unable to take a moderate hill on top. Also, I am doubtful whether a car would stand the all-weather work, and be capable, with minimum attention, of covering even horrible roads at 30 m.p.h. All this I have found motor cycles stand, and I feel like a man changing a good servant. I should be glad of the advice of your readers.

A. W. MANSFIELD.

THE THREE-JET BINKS CARBURETTER.

Sir,—I have been most interested in the discussion which has been going on for the past few weeks *re* the "dead spot" in Binks carburetters, for curiously enough I have found this "dead spot" to exist between the pilot and second jets, and have had no trouble in getting on to the main jet. To be a little more precise, I find there is a distinct "dead spot" when the pilot is fully open, but so soon as I get a whiff of petrol from the second jet the engine accelerates in a remarkable manner. On gradually opening on to the main jet the machine literally leaps forward, and I must confess I can usually get all the power I require from the first and second, and seldom open the main at all.

I have never been able to get the ideal pilot jet, *i.e.*, one which will start the engine easily, and yet will not require extra air.

I find that if I use the next size smaller to the one I have in at present I cannot start the engine at all, or only after prolonged effort, but on the present jet I can always start easily and take a little of the extra air when warmed up.

Now closing this air or opening further makes not the slightest difference to this "dead spot," and as this "dead

spot" occurs only when the pilot is open fully I cannot see that the second jet can have anything to do with the trouble, for at this point the second jet has not come into play.

Now I do not object to using the air lever; on the contrary, I would not be without it, but if this "dead spot" could be removed I should have nothing whatever to complain of in this most excellent instrument. My machine is a 1915 $3\frac{1}{2}$ h.p. twin Zenith (countershaft), and it is still in a new condition, but I cannot give the sizes of the jets, as I am, alas, far away from my beloved machine, and my memory does not serve me. Also, I have not had an opportunity of riding it for over twelve months.

Just one word in praise of the Zenith. I have ridden it 3,500 miles without the slightest trouble, have shortened the belt twice (Who says Zeniths eat up belts?), and have always found it a most delightful machine to ride. It holds the road well, and has a good turn of speed, and will climb practically any hill. Will Messrs. Zenith Motors give us solo riders a lighter machine with a $3\frac{1}{2}$ h.p. flat twin engine and a decent spring frame? I think the gear is all that could be desired. Usual disclaimer.

F. W. MARSHALL (Lt.).

Sir,—After seeing in *The Motor Cycle* for February 6th a further letter on the Binks carburetter, I give you the following experience. During a recent Friday, Saturday, and Sunday I went 502 miles on a $3\frac{1}{2}$ h.p. three-speed Sunbeam, and used exactly five gallons of No. 3 and Scotch naphtha mixed in equal parts.

My journey was *via* Glasgow, Carlisle, Kirkby Lonsdale, Ingelton, Skipton, Bradford, Rochdale, Bolton, Preston, Kendal, Carlisle, and home again.

The "dead spot" will certainly occur with wrong jets, but with a little patience in adjusting the jets and the air slide to suit the fuel it is entirely avoided. Considering that I have mud-shields, and carried 30 lb. of luggage, in addition to riding $11\frac{1}{2}$ st., I think the economy is noteworthy, with double journey over Shap. I may also say that in 7,500 miles I have never had a choked jet or other carburetter failure, and after fourteen years motor cycling prefer this to any make I have tried. Usual disclaimer.

The roads over Shap Fell and from Kirkby Lonsdale to Settle were dangerous through ice and frozen snow. There was also a considerable amount of ice and frozen snow on the Lanarkshire roads.

With the exception of a few miles round Carlisle and a portion of Shap, the surface is quite good and a "steady" pace can be maintained.

I refrain from stating my average speed! —

Next to a reliable machine for these winter journeys, I find the chief necessities are a Thermos of Bovril, and several layers of light warm clothing.

SUNBINKS.

Balloch, N.B.

Sir,—With reference to the controversy regarding the "dead spot" in the Binks carburetter, I may say that I have used this instrument on a two-stroke, four-stroke single, twins, and four-cylinder engines, and as yet have been unable to detect a dead spot. I have lately subjected this carburetter to a laboratory test, and can still find no trace of this spot. I would suggest that if users fit the correct jets, following the simple instructions given by the makers, they will find no dead spots and will come to the same conclusion that I have—that the Binks is the only carburetter worth having.

I have no interest whatever in Messrs. Binks and Co.

London.

ENGINEER.

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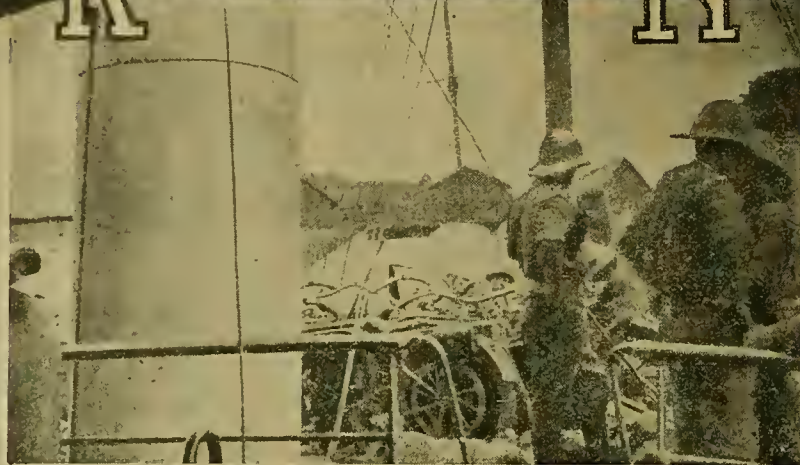
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through the
East
African
Jungle.



The very
Strenuous
Conditions
there Over-
come prove
the British
Machines
Unbeatable
for Work
Overseas.

Reminiscences by (Rev.) F. J. Ashley, formerly Chaplain and Capt. S.A.M.C.C.

LATE in April, 1916, two hundred and fifty of us, officers and men, clambered down from the carriages of the Uganda Railway Co. at Voi, which is situated about one hundred miles inland from Mombasa.

We were immediately placed in quarantine, and camp was struck, not to journey to the front, but to depart three miles up-railway to a solitary camp in the bush. We had arrived in the country at the tail end of the rainy season, and the afternoon on which camp was struck, down came the heaviest storm local planters said they could remember for twenty years. Kits were soaked, and many mags. had no spark of life left in them. Machines were dotted all along the three-mile path to the new camp, but the mags. were speedily revived over fires the next day, and when the timing was successfully accomplished by men who had never taken a magneto down before, it was felt that the morning lectures of the two previous months had not been wasted.

A Seven-mile Column.

The fortnight spent at the new camp was passed chiefly in hunting and practising riding in column. The only road available for the latter was a narrow footpath alongside the railway, and platoon commanders had many threatened attacks of apoplexy on the approach of trains and the subsequent anxiety to see that all were clear.

To train over two hundred men to ride in single file requires patience for officers and men. Our corps stretched over seven miles in length when in line, and the difficulty was to set a pace that would allow the whole line to be moving uniformly. The leading men had to begin with a low or middle gear pace till all were moving, for experience had proved that, if the advance guard moved off in top gear, the last man to get away would have to do fifty or sixty (if he could) to catch up. With all our practice, what generally

happened was that the advance guard enjoyed itself for two hours or so and then halted to allow the others to get up.

The rearguard and mechanics had the worst end of the stick, for it was their job to attend to any rider who fell out through a "fault" he could not right himself. The rule was that men rode in pairs or sections, and on one stopping, his half-section fell out to assist, and gradually—particularly later on—the work of the rearguard degenerated into pushing on a few incompetent riders. Sarcasm and strong language were its chief assets. I offered more than once to ride behind the column and help the stragglers, but was told that my presence was a bar to the use of efficient profanity as a spur.

Through the Sand Patch.

At last, on a sunny morning, we rode down the railway and turned out on the old caravan road that led to Kilimanjaro. Every machine was loaded with kit, rations, and equipment, totalling almost the weight of a light pillion rider.

For a time we rode over a good hard road through the Bura Mountains, but when we came out on the Serengeti plains we struck plentiful patches of sand. We were to learn in time to treat it with indifference born of patience and frequent practice in riding through it, but at first it caused exasperation. I well remember the first patch; it was not fifty yards long, but soft and deep; at the time I was riding dreamily along and enjoying the breeze. It is fascinating to ride in column when all goes well. The many engines made a pleasing roar, suggestive of efficiency and vigour, my own purring and "tat-tatting" away beneath me, and the heavy pack behind absorbing the shocks of the uneven surface. The line in front of one sways to and fro in the bush until one keeps one's position without being conscious of moving controls, and all was peace. Then the road ahead dipped suddenly, and the riders one after

From Kilimanjaro to Nyasa.—

another sank out of view, and over all hung a yellow cloud of dust. When I reached the edge of the descent I saw the cause was a stretch of sand. I stopped, drew out of the line (being a privileged person), and watched proceedings. There was no hard and fast



At Kilossa (white man's grave). The hut was erected for a stay of a few days in the district.

law about sand, since it had not been met before. Some charged down into it as hard as they could go, trusting to speed to carry them through, while the more timorous or sensible dropped into low and paddled. It was comical to watch. A man would set his teeth and blind down into it, swerve violently to avoid one overturned machine, and find himself climbing the bank on the side of the road, swerve back, thrust the lever into low, and charge down into the fray, dodge again and climb the other bank, swerve back once more, feet all a-splay, dodge yet again, and then crash into another perspiring rider.

A Nightmare Ride.

"Where the —" each would vociferate, and then go down before the onrush of a third. Months later, many of us could get through long stretches of sand or in top gear without taking our feet off the boards, and leaving a furrow a ploughman might envy.

We did not travel far that day, but on the next had to reach Moschi, about one hundred miles from Voi. The road was terribly bumpy in the morning ride, and insecurely packed kits suffered. Tins of bully, knives, forks, boots, socks, all sorts of things, strewed the roads to form wealth for the local natives, since few men cared to drop out of the line and lose their position.

Darkness fell with ten miles to go, but orders were strict. Only the rearguard was allowed to stay out. It was impossible to see a dozen feet ahead. The roads were muddy and ploughed into lorry ruts a foot deep, and often these intersected. We fell repeatedly, not to mention getting into the "sluit" or ditch at the roadside.

Those ten miles were a nightmare. Once we were cheered to see a fire in the distance, but it was only placed there to divert us into another track to avoid a broken bridge over a swift-running river. Many a man wished the fire had not been there—or said he did. Men struggled into Moschi up till midnight, and after getting a man or two to help the machine on to its stand (it was beyond one man), just dropped

down into a sleep which a dozen bugles would not have disturbed the next morning. In spite of their repeated falls, the machines suffered trifling damage (chiefly twisted handle-bars and bent footboards), and the morning was given to lounging and overhauling.

We spent three days at Moschi, due to the fact that Gen. Smuts had grave doubts as to the possibility of cycles getting through to the front at Kondoa Irangi, some two hundred miles away. Ninety miles away was a place called Lol Kisale, and the Colonel was told to take twelve men and get there and back in three days as a test. The twelve best riders were chosen and accomplished the feat, though it fairly exhausted them. They reported that the roads were as bad as the one we had just traversed.

Rescuing an Armoured Car.

On the fourth day we bade farewell to the glories of Kilimanjaro and set off in high spirits for the Front. Four lorries went with us to carry petrol, spares, and supplies.

We slept from now onwards in the open, and each morning found the machines wet with dew and the pistons stuck with congealed "B" Mobiloil. Just to stand on the kick-start crank was to prove the poorest machine had an excellent compression, even on the exhaust stroke.

At mid-day we came across an armoured car stuck in a drift up to its hubs. Some fifty natives were making a feeble effort to pull it out. Fifty cyclists at once trebled the pulling power, and at the first "Heave!" the rope parted. Each cyclist lay flat on the earth, but not a native so much as staggered. The men arose in wrath and chased the natives as far as they could see them. Then more ropes were produced and some two hundred men took hold and pulled and heaved till the four and a half ton car sulkily climbed the bank.

The delay caused by the car and getting the bicycles and our lorries over the river resulted in darkness falling with still ten miles to go. There were many groans at the prospect of further night riding, though the road was not so bad now. With half the distance accomplished the Colonel decided to camp in an open space in the bush.

(To be continued.)



A native hut used as sleeping quarters.

QUESTIONS AND REPLIES

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C.4, and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

Mixed Fuels.

? (1.) What is the difference between benzole, benzine, and benzoline? (2.) Will the last two run a Scott engine? (3.) If so, will they also mix with paraffin, and to what proportions?—J.R.M.

(1.) Benzole (C_6H_6) is a by-product in the manufacture of gas, being a distillate of coal; specific gravity .885 at $60^\circ F.$, boiling point $176^\circ F.$ Benzine is that fraction which comes over during the distillation of petroleum between 70° - 120° . Heptane (C_7H_{16}) is the principal constituent. This must not be confused with the aromatic hydrocarbon benzene (C_6H_6) or benzole. Benzoline is the more volatile portion obtained on redistilling benzine; boiling point about 70° to 95° ; often used as synonymous with benzine. (2.) Yes, but with the former some heating device should be installed. (3.) Benzoline only may be advantageously mixed with paraffin—about equal quantities.

Electrical.

? I am considering the question of converting a disused magneto, standard motor cycle pattern, into a lighting generator, by rewinding the armature and fitting a two-section commutator, and I would be glad to know if it is possible to obtain 2.5 to 3 amps., at six volts by suitable winding; also the correct gauge of wire for armature. Speed would probably be from 1,000 to 2,500 r.p.m. No doubt a higher speed would be necessary.—T.F.C.

Although it is not possible to say definitely whether you will obtain the output mentioned, it is quite reasonable to suppose that you may do so. The output of small dynamos is always a matter of some uncertainty, and depends greatly on the materials used and the workmanship. In a magneto machine also, the strength of the magnets is naturally a most important factor. We should recommend you to try the winding armature with No. 24 S.W.G., and see what results you get from that. Enamel-covered wire is the best, as the covering takes up less room, and so more wire can be wound on. When you remove the armature for winding, be sure to place an iron keeper across the poles of the magnet, and let this remain there until after the armature has been reinserted in the tunnel, otherwise the magnet will deteriorate in strength. You will probably find that the speed necessary will be at least 2,500 r.p.m.

Valve Timing, etc.

? (1.) What is the valve timing of a 1913 $3\frac{1}{2}$ h.p. Triumph? (2.) What position should the piston be in for giving best all-round results in timing with the magneto? (3.) What size jet gives best results for starting, speed, and economy of petrol combined? (4.) How much oil is required in the crank case when assembling the engine?—C.S.

(1.) Exhaust valve opens $\frac{3}{8}$ in. from bottom of firing stroke, and closes on top d.c. Inlet valve opens on top d.c., and closes $\frac{1}{8}$ in. up compression stroke. (2.) About $\frac{1}{4}$ in. down firing stroke on full retard. (3.) 28 or 30. (4.) A little less than half a pint.

IMPORTANT NOTICE.

GOODS MADE IN GERMANY.

The proprietors of this journal, being fully in accord with the recommendations agreed upon at the Paris Economic Conference, give notice that they will not permit the advertisements of new goods manufactured in enemy countries to appear in this publication.

ILIFFE & SONS LTD.

A Question of Sale.

? I took my motor cycle to a garage for repairs, when the proprietor asked me if I would sell it, which I consented to do. He could not pay me at the time, but agreed to do so in three days, time. I went for the money on the date mentioned, but he still had not got it, and asked me to call again in a fortnight. In the meantime I decided to keep the machine for my own use. When I told the proprietor he said I could not have it. He had the money to pay me, but I would not accept it. There was no deposit paid. Shall I be compelled to let him have the machine?—C.S.

There was a valid sale of the motor cycle. To make a sale binding, it is not necessary for there to be anything in writing when there has been part performance of the contract, and, in this case, there was part performance by reason of the motor cycle being handed over to the garage proprietor. The fact that payment was not made as promised would not nullify the sale, but would simply give you a right of action for the amount.

Dynamo Lighting.

? I am anxious to fit a dynamo lighting and self-starting set on to a Morgan, and want your advice on the connections. I have a twelve volt twenty ampere dynamo with ring oiling bearings, and intend driving this from the flywheel, and fitting an accumulator. Should the accumulator be fitted in parallel or series to keep the lights constant? I have an automatic cut-out to stop back charge from the accumulator if speed gets too low. My idea is to light the lamps permanently from the accumulator and just let the dynamo keep the accumulator fully charged.—T.W.E.B.

The accumulator must be fitted in parallel. We are not sure from your query whether the dynamo is one made for car lighting, and therefore with some means of automatically regulating the output so as to avoid excessive current at high speeds, or if it is an ordinary shunt-wound machine. If it is the latter you will not be able to keep it charging and the lights switched on at the same time, as the variation in voltage would be too great and would burn out the lamps. You could, however, manage to work it so as to charge the accumulator and then use the accumulator independently for the lights, and, from the last sentence in your letter, we think this is your intention. In your first sentence you mention a self-starter; we presume you intend to use a separate motor for this purpose. It would be no good trying to use this dynamo as a motor for starting.

RECOMMENDED ROUTES.

NEWCASTLE TO GLASGOW.—D. McQ.

Newcastle, Ponteland, Otterburn, Carterbar, Jedburgh, St. Boswell, Melrose, Innerleithen, Peebles, Biggar, Lanark, Crawford, Hamilton, Glasgow. Approximately 145 miles.

CONGLETON TO DURHAM.—A.E.F.

Congleton, Buxton, Bakewell, Chesterfield, Barlborough, Worksop, Doncaster, Ferrybridge, Aberford, Wetherby, Boroughbridge, Leeming Lane, Scotch Corner, West Auckland, Spennymoor, Durham. This avoids all big towns.

STAPLE HILL TO CANTERBURY.—H.L.

Staple Hill, Marshfield, Chippenham, Calne, Marlborough, Hungerford, Newbury, Kingsclere, Basingstoke, Odiham, Farnham, Hog's Back, Guildford, Shalford, Shere, Dorking, Reigate, Redhill, Oxted, Westerham, Riverhead, Wrotham, Maidstone, Lenham, Charing, Canterbury.

MISCELLANEOUS ADVERTISEMENTS.

PRICES.

ADVERTISEMENTS in these columns—First 12 words or less 2/-, and 2d. for every additional word. Each paragraph is charged separately. Name and address must be counted. Series discounts, conditions, and special terms to regular trade advertisers will be quoted on application.

Postal Orders sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd., and crossed & Co.**

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.4), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge, which must include the words Box 000, c/o "The Motor Cycle." Only the number will appear in the advertisement. All replies should be addressed No. 000, c/o "Motor Cycle," 20, Tudor Street, E.C.4.

DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pays carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged; when under £10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

MOTOR CYCLES FOR SALE.

A.B.C.

A.B.C.—Earliest deliveries. Your name on our list ensures this.—Martin Mitchell, Ltd., Stafford. [X4612]

JONES' Garage.—A.B.C. We are appointed agents, and can deliver in April or May.—Broadway, Maswell Hill. [X4821]

WE Are Now Booking Orders for earliest deliveries of A.B.C. motor cycles. Secure an early delivery by placing your order with us now.—Dunwells' Garage, Wigan. Tel.: 328. [X3219]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery of the new A.B.C. [X2254]

A.J.S.

A.J.S.—For 1919 models and service, Taylor, Garage, Wednesbury. [X3774]

CROW Bros., Guildford.—A.J.S. Agents since 1912. Write us for your requirements. [X9777]

A.J.S. Solo, 6h.p., 2-speed countershaft, all-chain, kick start; £50.—79, Park Hill, Clapham. [X4714]

19 A.J.S. Combinations.—Write Merrick's Stores, 174, Listerhills Rd., Bradford. Phone: 2439. [X2430]

1916 A.J.S., 6h.p., excellent condition, with Lucas lamp set; price £77.—Jennings, Glendown, Muston Rd., Fley. [X4583]

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NORTON.
MATCHLESS.
ROYAL ENFIELD.
HARLEY-DAVIDSON.
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SIDECAR COMBINATIONS.

NORTON, 1916, 4 h.p., 3 speeds	£110
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HARLEY-DAVIDSON, 1917, 7-9 h.p., electric	£135
SUNBEAM, 1914, 3½ h.p., Gloria	£90
A.J.S., 1915, 6 h.p., electric lamps	£110
SUNBEAM, 1916, 3½ h.p., all accessories	£105
DOUGLAS, 1915, 4 h.p., Sidecar	£85
MATCHLESS, 1918, 8 h.p., spare wheel ...	£145

SOLO MACHINES.

DOUGLAS, 1914, 2½ h.p., 2 speeds	£45
TRIUMPH, 1908, 3½ h.p., running order	£22
LINCOLN-ELK, 1913, 2½ h.p., good order	£22
PREMIER, 1914, 3-sp. countershaft, 3½ h.p.	£48
SUNBEAM, 1915, 3½ h.p., 3-speed	£95
SUNBEAM, 1916, 4-5 h.p., 3-speed, Cowey ..	£98

LIGHT CARS & RUNABOUTS.

MORGAN, 1915, Grand Prix, J.A.P.	£165
MORGAN, 1915, Grand Prix, 4 speeds	£185
MORGAN, 1915, G.P., yellow and black	£165
G.W.K., 1915, 8 h.p., standard	£195
STELLITE, 1914, dickey seat	£250
CALCOTT, 1916, dynamo set, standard	£375
PEUGEOT, 1914, 6 h.p., white and black	£195
HUMBER, 1914, 10 h.p., dynamo and starter,	
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Mayfair 552

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London.



MOTOR CYCLES FOR SALE.

A.J.S.

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery of the new A.J.S. [X2255]

A.J.S., 1914, 2½ h.p., 2-speed and clutch, splendid condition, like new; £40.—G. Baets, 44, Denton Rd., Twickenham, Middlesex. [X4693]

6 h.p. A.J.S. late 1915 Combination, hood, screen, lamps, speedometer, chain; £90.—47, Hereford Rd., Westbourne Grove, W.2. [X4761]

A.J.S.—For quick deliveries try the sole Leicester shire agent, Will Chapman, 113, Belgrave Rd., Leicester, the first appointed A.J.S. agent. [X3531]

A.J.S. Combination, 1915, 6h.p. twin, detachable wheels, spare wheel and tyre, screen, de luxe sidecar; £120.—Wauchope's, 9, Shoe Lane, Fleet St., London. [X4794a]

A.J.S. 1914½ 6h.p. Combination, fully equipped, detachable wheel, excellent condition, mileage 4,104; what offers over 75 gns? seen any time.—Nesbitt, Fern Bank, Orpington. [X4518]

A.J.S.—For the earliest possible deliveries of 1919 models, specifications, and super service, try the A.J.S. Specialists, The Walsall Garage, Wolverhampton St., Walsall. Phone: 444. [X4668]

A.J.S. (late 1914), 3-speed, 6h.p., with coachbuilt sidecar, fully equipped, splendid condition, engine just completely overhauled by makers, 2 lamps, tools and spares; seen and tested any time by appointment; price £95.—24, Rectory Rd., Ipswich. [X4571]

A.J.S. Spares, prompt delivery.—Cyril Williams, Chapel Ash Depot, Wolverhampton. Tel.: [X9139]

Alldays.

1915 Alldays Allon, 2½ h.p., 2-speed, good order; £33.—85, High Rd., Lee, S.E. [X4630]

ALLON.—Earliest deliveries. Your name on our list ensures this.—Martin Mitchell, Ltd., Stafford. [X4613]

ALLON 2-stroke, 2 speeds, hand-operated clutch; immediate delivery.—Parker's, Bradshawgate, Bolton. [X4653]

ALLON 2-stroke De Luxe, 2 speeds and clutch; £55.—Isle of Wight agents, Witham Bros., Newport, Wight. Early deliveries. [X3686]

1915 2½ h.p. Allon 2-stroke, 2-speed, lighting set, horn, belt and chain guards, as present model, perfect condition; £33.—Alter 7.30, 107, Tylecroft Rd., Norbury, S.W. [X4691]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery 2-speed and clutch Allons, £58; also De Luxe models, with kick start, £65. [X2258]

2½ h.p. Alldays 2-stroke, 1916, one speed, but guaranteed climb any reasonable hill, and in perfect order; inspection and trial, appointment; £32, or nearest.—James Pollard, Wragby, Lincoln. [X4811]

ALLDAYS Allon.—We have in stock 1918 2-speed, like new, £48; 1915 2-speed, £33/10; and 2 1916, price £42/10; 2 1917 2-speed, hand clutch, £44 and £46/10; and 1918 2-speed, hand clutch, and featherweight sidecar, £65; all complete with accessories.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [X4586]

Antoine.

ANTOINE Twin, splendid order; £17/10.—Hall, 2, Hockron Cottage, High Rd., Whetstone, N.20. [X4461]

ANTOINE 5-6h.p. Combination, kick-starter, in new condition, for sale; £23/10, or take 3½ h.p. combination in exchange, with cash adjustment either way.—C. Clark, 133, Liverpool Rd., Islington, N. [X4606]

Ariel.

1919 Ariel, 3½ h.p., 3-speed, new, in stock; £80.—86, High Rd., Lee, S.E. [X4631]

3 h.p. Ariel, now in parts, £8, less magento; Rex 3½ h.p. engine, 50/-—53, Stanway Rd., Coventry. [X4555]

JONES' Garage.—Ariel 5-6h.p. combination in stock; 3½ h.p. solo in stock. £80.—Broadway, Maswell Hill. [X4823]

1916 Ariel 5-6h.p. Twin Combination, in excellent condition; price £80.—Hipwell, Wooders Hill Farm, Hertford. [X4659]

ARIEL, 3½ h.p., countershaft, solo £80, combination £106; early delivery.—Island agents, Witham Bros., Newport, Wight. [X3688]

4 h.p. Ariel Combination, variable gear, B.B., mag., Montgomery sidecar, luggage grid, about 1912; £30.—Melrose, 1, Kenlor Rd., Pootung. [X4517]

ARIEL Big Single, 1916, 3-speed countershaft, kick-start, and coach sidecar, wind screen; 275.—Hargain.—29, St. Leonard's St., Bromley-by-Bow. [X4665]

NEW 1919 3½ h.p. Ariel, fitted with coachbuilt sidecar, also new; the combination price, £98/14.—Wauchope's, 9, Shoe Lane, Fleet St., London. [X4794]

MOTOR CYCLES FOR SALE.

Ariel.

RIDER TROWARD and Co., 31, High St., Hampstead.—New 3½ h.p. 3-speed Ariel in stock, £80. Orders being booked for earliest delivery 5-6 h.p. combination. [2257]

Arno.

ARNO, 1914, 3½ h.p., disc wheels, Dunlops, T.T. bars, spring forks, low, fast, very sporty, in new condition, lamps, etc.; bargain, £36.—Thorpe, 54, Heygate St., Wulworth Rd., S.E. [4541]

Auto-Wheels.

WALL Auto-Wheel, running order; £5.—12, Wollaston Rd., Dorchester. [4712]

Genuine Wall Auto-wheel, little used; £10.—Murray, 37a, Charles St., Hatton Garden, Holborn. [X4563a]

WALL Auto-wheel, complete, as new, £9/15; also various motor accessories.—Beardshaw, Wood Green. [4550]

Bat.

1915 Bat, 8 h.p., 3-speed, nice condition; £55.—Ross, 86, High Rd., Lee, S.E. [4632]

5-6 h.p. Bat-Jap and Sidecar; £35.—Prince of Wales, Fortune Green, West Hampstead, N.W.6. [4710]

6-8 h.p. Bat-Jap Combination, 1914, 3-speed gear box, clutch, kick-start, lamps, horn; £65.—5, Rossiter Rd., Balham, S.W.12. [4490]

BAT-J.A.P., 6-8 h.p., Sturmer 3-speed, coachbuilt sidecar, Orto wind screen, 3 lamps, electric outfit, in first-class condition; £65.—K., 38, Marlow Rd., Anerley, S.E. [4680]

BAT-J.A.P. 5-6 h.p. Twin, Bosch, Binks carburetter, Mabou clutch, perfect running order; £25, or exchange for lightweight.—Manager, 20, Vicarage Rd., Battersea Sq., S.W. [4698]

BAT Combination, 6 h.p. twin, fitted with Swan sidecar, 3-speed, kick-start and free engine, all chain drive, £87/10; also 4-5 h.p. twin-cyl. 2-speed solo Bat, £57/10.—Wauchope's, 9, Shoe Lane, Fleet St., London. [4795]

Bradbury.

4 h.p. Bradbury, 2-speed, free engine, good order; £28/10.—200, High St., Tooting, S.W. [4660]

4 h.p. Bradbury, very powerful and fast; £25.—Wauchope's, 9, Shoe Lane, Fleet St., London. [4796]

1919 Bradburs; cash or exchange.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [4560]

BRADBURY, 1911, 4 h.p., Grado pulley, just overhauled; £20.—J. F. Woolley, 32, Juer St., Park Rd., Battersea, S.W.11. [4445]

1913 Bradbury, 4 h.p., single-speed, speedometer, and horn, in very good condition throughout; £25.—Wilson, 66, West Sq., S. Farnborough, Hants. [4782]

BRADBURY, 4 h.p., Bosch mag., N.S.U. 2-speed gear, stand, carrier, smart machine; £27/10.—Murray, 37a, Charles St., Hatton Garden, Holborn. [X4564]

BRADBURY Combination, 4 h.p., all new tyres and belt, ready to ride away; £30; only wants seeing; Bosch mag.—The Firs, Cambridge Rd., Farnborough. [X4569]

BRADBURY, 4 h.p., Bowden 2-speed countershaft, as new, with wicker sidecar, stored 3 years; £35, or exchange for higher power, cash adjustment.—Hart, 359, Oxford Rd., Manchester. [X4524]

4 h.p. Bradbury, Empire C.B. light sidecar, Sturmer-Archer J.S. 3-speed and clutch, waterproof Bosch, lamps, horn, 2 belts, tyres excellent, one Dunlop new, engine guaranteed, perfect; £45.—Maggs, Horse Shoe Rd., Pangbourne, Berks. [X4576]

Brough.

1916 Brough, 3½ h.p., 3 speeds, clutch, kick-starter, coachbuilt sidecar, lamps, horn, tools, and spares, in first-class condition; £70.—44, Howard Rd., S. Norwood. 'Phone: Croydon 471. [4679]

B.S.A.

B.S.A., 3-speed, 1919 models in stock.—Reys, 378, Euston Rd. [2972]

B.S.A., 4½ h.p., 1918, 3-speed, as new; £70.—47, Streatham Hill, S.W.2. [4511]

NEW B.S.A.'s in stock; immediate delivery Model K.—Alexander, Agent, Wallasey Village. [1506]

JONES' Garage.—B.S.A. agents; two in stock, model H. £81/15, model K. £79/16.—Broadway, Muswell Hill. [4822]

1913 4½ h.p. B.S.A., C.-C.B. drive, shop-soiled, £75; also 1914 B.S.A. combination, 3-speed, full accessories.—86, High Rd., Lee, S.E. [4633]

B.S.A., 1915, 4½ h.p., 3-speed countershaft, stored 2 years, as new, new tyres, coachbuilt sidecar; £60.—Moore, Cable End, Farnborough, Hants. [4684]

B.S.A., 3½ h.p., 2-speed gear, and hand clutch, Lucas K.B. lamp set, horn, tools, excellent tyres, perfect throughout; £35.—Abergele Motor Co., Abergele. [X4408]

B.S.A. Combination, coachbuilt sidecar, 1916 model, countershaft gear, free engine and kick-starter; £84.—Wauchope's, 9, Shoe Lane, Fleet St., London. [4797]

1915 B.S.A., clutch model, with 22 gn. sidecar, all accessories, outfit good condition, sound running order; £50; after 6 p.m. only.—7, Ravenhurst Av., Hendon. [X4513]

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Whether that need be Solo or Sidecar, Single or Twin, Touring or Speed, High Power or Low, you'll find the mount to fill it at my Depot in John Bright Street.

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MOTOR CYCLES FOR SALE.

B.S.A.

3½ h.p. B.S.A., free engine, 1914, run about 500 miles, as new, guaranteed sound, not used last 2 years; what offers? owner in army.—Pte. Young, Mier-ton, Somerset. [4667]

B.S.A.—For the earliest possible deliveries of 1919 models, specifications, and prices, sole district agents, The Walsall Garage, Wolverhampton St., Walsall. 'Phone: 444. [4669]

RIDER TROWARD and Co., 31, High St., Hampstead.—New 4½ h.p. B.S.A., chain-cum-belt, in stock, £79/16. Orders being booked for earliest delivery chain drive model, £81/18. [2259]

1916 B.S.A. 4½ h.p. Combination, chain-cum-belt, in splendid running order, with speedometer, head lamp, and mechanical horn; £75.—A.B., 8, Ingle Villas, Woodhouse Rd., North Finchley, N.12. [4528]

B.S.A. and Coachbuilt Sidecar, 1916, 3-speed, all-chain, kick start, overhauled and new tyres 1919, P. and H. lamps, horn, etc., perfect condition and running order; £70.—Lieut. Ward, R.A.F., Tern Hill, Salop. [X4456]

B.S.A., late 1916, Millford sidecar, with cantilever springs, Binks-carburetter, all electric lights, Lucas horn, tyres perfect, Stepney roadgrip on rear, tools and sundries; £92/10.—Parker's, Bradshawgate, Bolton. [X4658]

B.S.A.—We have 2 Model K's actually in stock, price 76 gns.; also 1916 K combination, price £89/10; and 1917 K combination, £95; both fully equipped and above average condition; good prices allowed on exchanges.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [4585]

Calthorpe.

1914 2½ h.p. Calthorpe-Jap, Enfield gear; £26.—Newson, 23, Palace Parade, Hornsey, N.8. [4681]

RIDER TROWARD and Co., 31, High St., Hampstead. Immediate delivery new Calthorpes, all models. [3603]

CALTHORPE Motor Cycles—All models in stock for immediate delivery.—P. J. Evans, 91, John Bright St., Birmingham. [0955]

1916 Calthorpe-Jap, Enfield 2-speed gear, original tyres, lamp set, as new, perfect; £35.—45, Bow Common Lane, Bow. [4744]

1916 Genuine 2½ h.p. Calthorpe-Jap, as new, used one month, stored since; £35.—"Egbert," Clif-ford Rd., New Barret. 'Phone: Barret 547. [4521]

1914 Calthorpe-Jap, 2½ h.p., Enfield gears, lamp, horn, brand new tyres, splendid order; £35.—Jones, Danstasy Agriculture College, West Lavington, Wilt. [X4427]

CALTHORPE-J.A.P., 1915, 2½ h.p., Enfield 2-speed gear and clutch, 2 lamps, generator, horn, tools, ready to ride away; price 35 gns.—Alhysa, 872, Forest Rd., Walthamstow, Essex. [4468]

Campion.

3½ h.p. Campion and Sidecar, P. and M. gear, in fine order, and complete; £38.—Cross, Agent, Rother-ham. [X4647]

CAMPION, 2½ h.p., 2-speed, lamps, horn, good tyres, condition perfect; £24.—Porkin, 21, Muschamp Villas, Warsop, Notts. [X4472]

CAMPION-J.A.P. 4 h.p. Tourist Model, 1914. Arm-strong 3-speed hub, splendid condition; £36.—Wood, 48, High St., Windsor. [4502]

CAMPION-J.A.P. 4 h.p. Combination, 2-speed, clutch, handle start, new belt, tyres good, Bosch mag., lamps, complete and ready to ride anywhere, guaranteed; £32.—Blackwell, Hall St., Burslem. [X4520]

Chater-Lea.

1915 5-6 h.p. Chater-Lea Solo, countershaft 2-speed, absolutely genuine bargain, £45.—Wadley Works Office, Wadley Rd., Leytonstone. [4533]

CHATER-LEA, 8 h.p., 1913-14, Jardine 2-speed countershaft, all chain drive, handle starter, Bosch mag., extra large sidecar, 3 lamps, car generator, just overhauled throughout, 3 new tyres, exchange less power, B.S.A. or Douglas preferred; £54; after 6, or P.C. before.—A.G., 35, Alired Rd., Acton. [4607]

Chater-Lea-Jap.

3½ h.p., Jap-Zenith engine, perfect condition in 32 Chater-Lea frame, N.S.U. gear, Bosch mag., Druid forks, ready to ride away; £25.—H.J.B., 10, Pembroke Mews, W.8. [4643]

CHATER-LEA 1914 Combination, 8 h.p. J.A.P. engine, 3-speed, clutch, all-chain drive, coachbuilt sidecar, storm apron, lamps, speedometer, handle starter, etc.; £70, no offers.—G. Sunman, Northfields, Dewsbury. [X4457]

Chater-Lea-Villiers.

1915 2½ h.p. Chater-Lea, Villiers engine, 2-speed, Powell and Hanners' lamps and generator, horn, as new; £27/10, lowest.—Smith, The Parade, Staines Rd., Bedfont, Middlesex. [4575]

Clyde.

CLYDE, 1914, 8 h.p. J.A.P. 3-speed, clutch, chain drive, aluminium sp., sidecar; £50.—Write, Rowe, Alexton, Uppingham, Rutland. [X4384]

MOTOR CYCLES FOR SALE.

Clyno.

CROW Bros., High St., Guildford, West Surrey agents for the 1919 Clyno Order now to ensure early delivery. [1553]

CLYNO 8h.p. Combination, combining best points of American and English big twins, just the outfit for the Island. Book orders for earliest delivery.—Witham Bros., Newport, I.W., Island agents. [3689]

1914 6h.p. Twin Clyno Combination, 3-speed counter-shaft and clutch, kick starter, chain drive, interchangeable wheels, spare wheel, tyres good, one new Palmer, hood up 3 years, whole outfit in splendid condition; price £85; seen Saturday afternoon or Sunday by appointment.—Wilson, 2a, Minard Rd., Hither Green, S.E. [4452]

Connaught.

CONNAUGHT, 2½h.p., late model; £23; excellent condition.—200, High St., Tooting, S.W. [4661]

Corah.

3h.p. Corah, 2-speed and clutch countershaft, as new; £30.—Wright, 113, Blair St., Poplar, London. [4600]

Coventry Eagle.

1917 Coventry Eagle, 2-stroke, 2-speed, mileage about 200; £40; exchange T.T. single.—147, Greenfell Rd., Maidenhead. [X4577]

2½h.p. Coventry Eagle, good condition, tyres almost new; exchange with cash for Douglas, or sell 20 gns.—Captain Davis, 3, Training Depot Station, Locomotive Court, Nether Wallop, Hants. (D) [4439]

Dot.

DOT-J.A.P. 1915 8h.p. Combination, tip-top order new heavy tyres, coachbuilt sidecar, folding wind screen, lamps, luggage carrier, etc., smart, powerful; any trial, £30; only wants seeing.—Fletcher, 1, Barrowell Green Villas, Green Lanes, Palmer's Green, N.13 [X4266]

Douglas.

DOUGLAS, 2½h.p., 2-speed, good tyres; accept £29.—277, Camberwell Rd., S.E. [4759]

DOUGLAS, 2½h.p., 2-speed, tyres new, perfect; £38.—45, Bow Common Lane, Bow. [4744a]

1912 Douglas, good running order; £21, or offers.—Rawcliffe, Elder House, Huddersfield. [X4662]

DOUGLAS, 1912, £20; 1913, £30; both in good running order.—Paine, Borough, Canterbury. [4422]

1919 Douglas in stock; exchanges quoted.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [4557]

DOUGLAS.—Book your order now for new models; exchanges.—Parker's, Bradshawgate, Bolton. [X4651]

1912 Douglas, 2½h.p., 2-speed, good condition; £25.—Medgwick, Biltmore, Hindhead, Surrey. [4741]

DOUGLAS, 1915, 2½h.p., 2-speed, just overhauled; £42/10.—53, Devonport Rd., Shepherd's Bush, W.12. [4778]

LOOK.—Douglas, T.T., 1915-16, countershaft gears, almost new; £45/10.—R. Sinclair, 5, Victoria Av. Larniton. [X4270]

DOUGLAS Cycle, 2 speeds, T.T., nearly new; £42; all accessories.—51, Maplethorpe Rd., Thornton Heath, S.E. [4721]

1915 Douglas, 2½h.p., 2-speed, lamps, horn; £45.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C.3. [40491]

DOUGLAS in Stock, 4h.p. combination, £95; War Office 2½h.p. model, £60, new.—Moffat, Yeovil. Phone: 50. [1103]

DOUGLAS, 2½h.p.; must sell, going away: perfect running condition; £25.—Marshall, 77, Englefield St., Maryport. [4554]

GIBB, The Douglas Expert, Gloucester, is the man to get in touch with for best deliveries and advice. Phone: 852. [4749]

1914 2½h.p. Douglas, tyres and belt new, lamps and speedometer, perfect; £58.—Box 2, 947, c/o The Motor Cycle. [X4437]

DOUGLASES.—1915, 2½h.p., 2-speed, accessories, £49; 1915 3-speed, £52; 1915 2-speed, £46.—86, High Rd., Lee, S.E. [4634]

DOUGLAS, 1910, 2½h.p., a.v., mag., requires slight adjustments only; £18.—Nicks, 141, North St., Bedminster, Bristol. [X4626]

FOR Sale, 1915 2½h.p. Douglas motor cycle; 40 gns.—Storey, 7, Blenheim Terrace, Abbey Rd., St. John's Wood, N.W.8. [X4856]

1914 (late) Douglas, 2½h.p. T.T., 2-speed, Lucas lamps and horn, almost as new, perfect; £37.—Bromley Oswald, Hadley, Salep. [X4607]

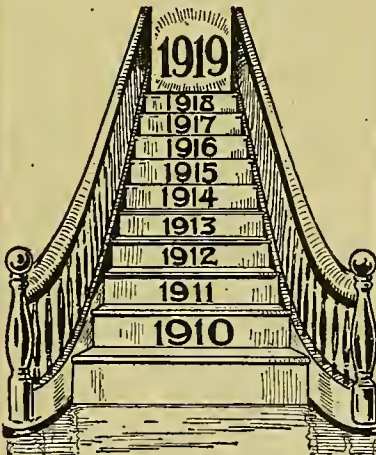
DOUGLAS, 2½h.p., late 1914, engine overhauled; cost £14, will sell £37/10, lowest.—Smith, 3, The Parade, Staines Rd., Bedford, Middlesex. [4576]

DOUGLAS, late 1913, T.T. model, an exceptionally fast, sound machine; £37/10.—Longman Bros., 2, King's Parade, Acton. Tel.: 1578 Chiswick. [4772]

£75.—1919 Douglas, 2½h.p., with lamps, just delivered private owner; first cash: can ride away.—Write appointment, McCrimmon, 34, Clarendon Gardens, Maida Vale, W. [4421]



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1919 Douglas Motor Cycles, delivery from stock; 2½h.p. 2-speed, £60; 4h.p. 3-speed combination. £105.—Tom Norton, Ltd., Llandrindod Wells. [X4620]

DOUGLAS, 1916, 2½h.p., 2-speed, used only 3 months, as new, speedometer, lamps, etc.; price, £60.—Samuelson, 24, Cable Rd., Hoylake, Cheshire. [X4470]

DOUGLAS, genuine 1913, T.T., 2-speed, counter-shaft, Bosch mag., Amco carburettor, ready to ride away; £27, or offer.—Hawkins, Holmsted Place, Cuckfield, Sussex. [X4567]

DOUGLAS, 1919, 2½h.p., 2-speed; price £60; actually on premises: 1916 2-speed W.D. model.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [4583]

DOUGLAS, 4h.p. 1915 model, 2-speed speed model, lamps, horn, tools, been very little used, perfect order, condition as new; any trial; price £60.—Abercote Motor Co., Abercote, N.W. [4137]

DOUGLAS, 2½h.p., 2-speed, new January, 1919, semi-T.T., with sporting sidecar, lamps, mechanical horn, knee grips, all disc wheels, tools; £80.—Tallett, 340, Shaftsmoor Lane, Hall Green, Birmingham. [4853]

DOUGLAS, 2½h.p., bought 1915, late 1914 model, 2-speed, enamelled grey, accumulator electric lighting, new large footboards, good running condition, complete tools, plenty of spares; £35.—Reeve, 12, Gisburn Rd., Horsey, London. [4532]

ELI CLARK can give you good advice also good deliveries of 1919 Douglas motors. He will help you if possible with spares. The man on the spot.—196, Cheltenham Rd., Bristol. Phone: 4169. Wires: Ignition, Bristol. (Please do not send sample spares). [0966]

DOUGLAS, 1915, 3-speed, just overhauled, rear tyre practically new, front good condition, 2 lamps, generator, horn, pump, spare chain, spare belt, 2 spare plugs, a good reliable machine, ready for the road; £55, or nearest offer.—Capt. Chapman, Woodend, Charlton Kings, Cheltenham. [X4414]

2½h.p. Douglas, brand new, fitted 2-speed gears, 2 touring or semi-T.T. bars, footboards 15/6 extra, £60; two best lamp sets, horn, registration, writing number plates, £4/4 extra; enquiries invited, full specification by post; deliveries in rotation.—Robinson's Garage, Green St., Cambridge. [4333]

DOUGLAS, 4h.p. and 2½h.p., brand new models, in stock. We are stockists and specialists of Douglas machines only, giving the fastest service and the greatest choice of models in the South. Over nine years' experience as Douglas agents.—Thompson and Co., 408, Commercial Rd., Portsmouth. Phone: 7105. [2518]

4h.p. Douglas, brand new, fitted 3-speed gears, clutch kick-start with Douglas coachbuilt sidecar, £95; 3 lamp sets, horn, registration, writing number plates, £5/10 extra. Enquiries invited; full specification by post; deliveries in rotation.—Douglas Specialists, Robinson's Garage, Green St., Cambridge. Tel.: 388. T.A.: Bicycles. [4332]

De Dion.

DE DION or pattern, 2½h.p., very low frame, mag. ignition, 26x2¼ wheels, B. and B. carburettor, perfect order; £9/15.—2, Appian Rd., Roman Rd., Old Ford. [4423]

Edmund.

EDMUND-J.A.P., spring frame, 2½h.p., 2-speed models; £63, in stock.—Marston, 31, Bridge St., Chester. [X4532]

Emblem.

1918 Emblem, 10h.p., T.T. clutch model, perfect; £80.—86, High Rd., Lee, S.E. [4635]

Enfield.

ROYAL Enfield 3h.p. Twin, 2-speed, as new; £35.—The Old Forge, Whetstone, N.20. [4463]

1916 3h.p. Twin Enfield, good as new; seen any time; 48 gns.—42, Invicta Rd., Dartford. [4792]

1916 3h.p. Enfield, in fine order, complete lamps, etc.; £47.—Cross, Jeweller, Rotherham. [X4575]

ENFIELD, all models, early deliveries.—J. A. Stavey, Sole Agent, 12, Ecclesall Rd., Sheffield. [X1543]

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ENFIELD 3h.p. Lightweight, 2 speeds, exhibition condition; £42.—51, Maplethorpe Rd., Thornton Heath, S.E. [4723]

1919 Enfields, 3h.p. 66 gns., 6h.p. combinations 110 gns.; actually in stock.—Tom Norton, Ltd., Llandrindod Wells. [X4269]

ENFIELD, 3h.p., twin, 1914 T.T. model, fine condition; any trial; 40 gns.—Parker's, Bradshawgate, Bolton. [X4660]

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ENFIELD 1915-16 6h.p. Combination, Lucas dynamo lighting, heavy oversize tyres; £115.—Parker's, Bradshawgate, Bolton. [X4654]

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ENFIELD Combination, 6h.p., really sound outfit; 63 gns.—Longman Bros., 2, King's Parade, Acton. Tel.: 1578 Chiswick. [4774]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries Enfields, all models. [2261]

ENFIELD 3h.p. Twin, Model 140, 2 speeds, etc., slightly soiled; 50 gns.—The Exeter Motor Cycle and Light Car Co., Ltd., Bath Rd., Exeter. [0958]

ENFIELD—The latest 1919 model combination in stock, also two second-hand combinations, one fitted Enfield Tradesman's box.—Celtic Works, East Hill, Wandsworth. [4619]

ENFIELD Combination, 6h.p., late 1915, new condition, 3 lamps, Lucas horn, speedometer, mirror, and lot of spare parts, nearly new Dunlop extra heavy tyres, sidecar fitted with wind screen, clock, warmer, apron; £92/10; seen any time except Thursday afternoon.—Sibley, 106, Market Place, Romford. [4612]

Excelsior.

EXCELSIOR, 1913, 3½h.p., hand clutch, B. and B., Bosch, nice appearance; £35.—Jarrett, 150, Bunhill Row, E.C. [4441]

F.N.

F.N., 4-cyl., 6h.p., in good condition; a bargain, £27/10.—41, Brighton Rd., Croydon. [4497]

F.N., 4-cyl., clutch model, good tyres, Bosch, Caxton, not used 2 years; trial; £29.—15, Mervan Rd., Effra Rd., Brixton. [4690]

F.N., 4-cyl., not earlier than 1912; state date, h.p., condition, price, and whether ready to ride away; cash.—Box 2,942, c/o The Motor Cycle. [X4565]

1914 F.N., 4-cyl., 3-speed, plate clutch, along with F.N. sidecar, speedometer, lamps, horn, and 2 extra covers; bargain at £65.—Miller, Ivy House, Brighouse. [X4592]

F.N., 4-cyl., 2-speed, drop frame, disc wheels, thoroughly overhauled, re-stove enamelled and plated; 25 gns.—Seen at Smith, 16, Herestock Hill, opposite Chalk Farm Tube Station. [4610]

Grandex.

GRANDEX-J.A.P., 4h.p., o.h.v., Bosch mag., 1914, very fast solo mount.—Blowers, 126, Lordship Lane, E. Dulwich, (D). [4438]

1915-16 2½h.p. Grandex-Precision, 2-stroke, Albion 2-speed gear box, brand new Pedley back, nice condition throughout; 30 gns.—Mason, Glenalmond, Bellevue Rd., New Southgate. [4623]

Harley-Davidson.

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new Harley-Davidsons. [2262]

HARLEY-DAVIDSON, 1917, 7-9h.p., khaki model, touring and racing bars; any trial or examination; £100.—Parker's, Bradshawgate, Bolton. [X4649]

HARLEY-DAVIDSON—Orders being booked for delivery out of the first batch to arrive; £5 deposit.—Maudes', 100, Gt. Portland St., London, W.1. [4865]

HARLEY-DAVIDSON, believed 1917, 7-9h.p., 3 speeds, condition as new; £100; too powerful for owner; lightweight wanted.—P. Driscoll, 58, Woodfield Rd., Ealing, W.5. [4655]

HARLEY-DAVIDSON, 7-9h.p., 1915, and Canelet sidecar, top-hole condition, new tyres throughout; first cheque £85 secures.—S. Ellis, 7, Grove Park Gardens, Chiswick, W.4. [X4418]

LATE 1915 Harley, 3-speed, magneto model, disc wheels, not used for 3 years, magnificent condition throughout, extra first one, exceptional opportunity; sacrifice £72.—Else, Dimple, Matlock. [X4618]

HARLEY-DAVIDSON Combination, late 1916, excellent condition, well equipped, looked over by Harley-Davidsons; £100.—Longman Bros., 2, King's Parade, Acton. Tel.: 1578 Chiswick. [4808]

HARLEY-DAVIDSON, 1917, 7-9h.p., mag. model, and H.D. sidecar, in exceptional condition, £120; also 1915 electric model, £67/10.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [4588]

HARLEY-DAVIDSON Combination, late 1915, dynamo lighting, 1916 improvements, lamps, speedometer, all accessories, mileage 3,000, perfect condition; 85 gns.—Maude, 255, Maldon Rd., Colchester. [4732]

HARLEY-DAVIDSON and Sidecar, in good running order, new Bosch mag., 3 new tyres, new apron, Klaxon horn, speedometer, and 3 electric lamps; £65, or exchange good light car, cash adjustment.—W. Turner, 79, Crown Rd., Gt. Yarmouth. [X4372]

HARLEY-DAVIDSON, 1916, electric model, bulbous back sidecar, Cape cart hood, Dunhill triple wind screen, special back carrier seat, speedometer, etc.; open to any trial and examination by appointment; must sell; £110, no offers.—32, Mornington Rd., London, N.W.1. [4495]

1916 Harley-Davidson, L.J. electric model, little used, perfect order, new spare inlet and exhaust valves, spare part worn chain, spare semi T.T. handle-bars complete with controls; any trial or examination; price £70 for quick sale; no offers; tyres excellent.—Donald Cameron, Bangor, North Wales. [X4417]



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Henderson.

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new Hendersons. [2264]

10 h.p. 1915 Henderson and Coachbuilt Sidecar, in perfect condition, lamps; any reasonable trial; 96 gns., no offers.—Hill, 2, Blackfriars Rd., Walsby. [4471]

ORDER Now for the Rolls-Royce of motor cycles, the Henderson, one that will take you there and bring you back, without failing.—Horswill, 42, Bridge St., Chester. Tel.: 943. [4447]

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HOBART 2½h.p. 2-stroke, ride away; £17/10.—Wright, 113, Blair St., Poplar, London. [4598]

1913 Hobart 2½h.p. 4-stroke, H.T. mag., new belt and pulley; £20.—Watson, Seer Green, Beaconsfield, Bucks. [4692]

Humber.

HUMBER, 1912, 2-speed, handle starter, and sidecar, very little used; £35.—Hall, Ironmonger, Ashford, Kent. [4647]

HUMBER, 3½h.p., 1913, 2-speed, handle starting, engine in excellent condition; £30.—Wood, 49, High St., Windsor. [4503]

HUMBER Lightweight, 2h.p., Bosch, new tyres, splendid order throughout; £18/10.—Speechley, 1, Gunnersbury Lane, Acton. [4700]

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3½h.p. Humber, 1912, 2-speed and clutch, accessories, stored for 4 years, nice condition, Mills-Fulford sidecar; £30.—154, Sandy Hill Rd., Woolwich. [4432]

2½h.p. Humber, countershaft, all chain drive, Bosch, 24 B. and B., overhauled, rebored, new piston, mechanical valves; first £17/10 cash.—B. Robinson, Prospect, Wheelton, near Chorley, Lancs. [X4522]

HUMBER 1918 Combination, 6h.p., flat twin, water-cooled, 3-speed, self-lubricating enclosed chain drive, shock absorber, Millford coachbuilt sidecar; the turnout was purchased absolutely new last month, and has only been for short trial run, powerful and flexible, equal to anything yet produced, only reason for selling owner purchased car, cost £125; what offers?—39, Alderman Rd., Ipswich. [X4571a]

Indian.

1914 Indian, 7-9h.p., 2-speed, Binks 3-jet; £40.—Birkett, Penrhos, Hanley, Staffs. [X4430]

28 GNS.—3½h.p. 1913 Indian, single, Bosch, clutch, speedometer, little used.—Railway Garage, Staines. [4786]

5 h.p. Indian, 3-speed, K.S. F.E., brand new; first offer over £70.—Flanders, Skye Cottage, Ashdon, Essex. [X4464]

5 h.p. Indian, 3-speed gear, kick-start and clutch, fast solo machine; £67/10.—Wauchope's, 9, Shoe Lane, Fleet St., London. [4798]

INDIAN 1915 Combination, in beautiful condition, spring frame; £70.—51, Maplethorpe Rd., Thornorton Heath, S.E. [4725]

INDIAN, 7-9h.p., 2-speed, spring frame, good condition; £45, bargain.—411, City Rd., Angel, Islington. (Over shop.) [4451]

INDIAN, 7-9h.p., late 1915, clutch model, mileage 500, new condition; inspection invited; £60.—Bell, Enfield Wash. [4519]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new Indians. [2263]

7-9h.p. Road Racer Indian, mechanically perfect, very fast, all necessary spares and tools; £45.—Lieut. Bowly, C.M.B.'s, Dover. [X4463]

INDIAN, 9h.p., late model, spring frame all accessories; sell £52, or consider 2-stroke and cash.—Mrs. Harrison, 23, Crookerton Rd., S.W.17. [4767]

1915 Indian, 7-9h.p., clutch, very fast, splendid condition; £62; trial, call Saturday, Sunday after 2 p.m. Saturday.—64, Balloch Rd., Catford. [4475]

INDIAN, 1914, 5-6h.p., special road racing model, splendid condition, ready to ride away; 58 gns.—Broad, Fruiters, 7c, Hornsey Rise, Holloway, N. [4488]

INDIAN, 5h.p., 3-speed, 1915 model, and sporting coachbuilt sidecar, good condition; 67 gns.—Longman Bros., 2, King's Parade, Acton. Tel.: 1578 Chiswick. [4771]

INDIAN Combination, 1916, 5-6h.p., 3 speeds, clutch, kick, equal to new, fast and powerful, Phoenix torpedo sidecar; £60 solo, £70 combination.—55, Watling St., Wellington, Salop. [X4608]



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The Removal of War-time Restrictions.

1.—Petrol.

NOW that we are living once more under "Peace" conditions, it is becoming more and more obvious that the entire removal of those restrictions upon motoring and motor cycling, which were accepted loyally as unavoidable during the war, is somewhat overdue. Various ameliorations have already been made, and for this we are grateful. It is no longer necessary to possess a special permit before one is allowed to take a motor cycle on the road at all. The petrol regulations were amended as the supplies became greater, first by the granting of much larger allowances to every applicant and, secondly, by the permission to purchase the petrol, for which the preliminary tax of 6d. had been paid, in *any* month instead of only in the *specified* month as hitherto. Both these concessions were welcomed as valuable and convenient, and we are now expecting the final demise of the Petrol Control Department, and with it, we hope, the removal of the 6d. a gallon tax to which we have just alluded.

As reported in our columns last week, the Royal Automobile Club has already approached the Government on this matter, its Parliamentary Committee having pointed out to the Secretary of the Treasury the urgent need for the immediate withdrawal of this war tax. The Automobile Association and Motor Union has also taken a similar line of action and has elicited the reply that, while the Treasury does not propose to tax benzole, the tax on petrol cannot be dealt with before the consideration of the annual Budget.

2.—Lighting.

We have already expressed our opinion on the matter of red rear lights on cycles (including, of course, motor cycles), and have but little to add to what we have already said. We are glad to note that this regulation is to be retained in spite

of all that has been so furiously urged against it, but if the authorities decided to allow the use of a really good reflex lamp in place of a live light, we should have no objection to make. We would again point out, however, that the absence of rear lights on something like half the pedal cycles seen on the road, together with the extreme inadequacy of their head lights, robs the regulation of nearly its whole advantage. When one is expecting both front and rear lights on every vehicle, the absence of lights on a road should mean that the road is clear of wheeled traffic—the presence of an unlighted cycle is then more disconcerting than if no rear light regulation were in existence.

The screening of head lights has been largely modified, and motorists are now permitted to carry quite adequate lights, but lately—in fact, almost ever since the Armistice was signed in November last—we have seen motorists on the road who disregard the modified regulations in the most *glaring* manner. In fact, only last week a car passed us which not only lit up the whole countryside with its head lights, but exhibited a bright white light to the rear.

It is quite obvious that those who cavil at and disobey the rear light rule are largely instrumental in forcing these glaring head lights upon car drivers, but we notice, with some amusement, that complaints of bright head lights are now emanating from the same quarter whence the complaints lately arose.

We would urge the police to be more active with regard to these infringements of the law, for they are both a real nuisance to law-abiding people. We do not wish that a cyclist whose rear light is jerked out by a piece of bad road should be treated severely, but a man with no rear light at all should certainly be taught that laws are meant to be obeyed.

One thing more. Surely during the months April-September inclusive, lighting-up time might be as it was before the war, viz., from one hour after sunset to one hour before sunrise.

A 250 MILES RIDE IN THE HOLY LAND.

Experiences of Two Despatch Riders on a Journey from Damascus to Horns.

TO many despatch riders their life in foreign lands will form perhaps the most interesting of their experiences. More particularly does this apply to those whose lot it has been to visit warmer and yet fairly civilised countries, where the bugbears of motor cycling—mud, and war-wracked roads—are unknown. Many will, therefore, envy Corporal Gurney Grice and another D.R. (whose experiences are here recounted) their two hundred and fifty mile ride through picturesque Palestine. Rising early is a pleasure in such a climate, and at 8.30 one morning they set off from Damascus on the first stage of their journey, to a little town called Zahle, perched on the eastern side of the Lebanon Range. The roads must have been fairly good for them to average 25 m.p.h., which they did, arriving in time for early lunch. From Zahle the road led up the mountain side in an interminable zigzag of hairpin bends of no slight gradient, crossing and recrossing the railway, which was provided with a toothed centre rail to enable the engines to ascend at all. The summit is 5,050 feet above sea level, so that the view in that glorious atmosphere must have been worth seeing. From this point the road fell at a moderate gradient for twenty-five miles. During the descent the engine was used in some parts as a brake. Away in the valley the red-tiled roofs of the scattered groups of houses, nestling under the shelter of the mountains, gleamed in the sunshine. The road, too, was bordered by numbers of these little villages, well built, and quite modern, which were populated by Arabs or Lebanese.

A Modernised Town.

The arrival at Beyrout, with its well-made roads and electric trains, was a return to civilisation. Another asset of civilisation, speed limits, was apparently absent, as they romped into the town at 30 m.p.h., having completed the hundred miles from Damascus in just over four hours. Deciding to stay the night here, the D.R.'s looked up some friends, and billeted their machines. The evening was spent in looking round the old town, which, under German rule, had been in the throes of a famine, still reflected in the pinched and starved appearance of even the well-to-do.

Early next morning the machines were replenished with oil and petrol, and after strolling round the town for a time and partaking of various Eastern delicacies and a bottle of wine, a start was made at 11.30 for the town of Tripoli, where it was intended to stay the night. The



One of the D.R.'s—Cpl. Gurney Grice, R.E.

first stop was at the quaint little village of Jujunich—a place devoid of restaurants or any public eating places. However, a stray table and two chairs were discovered and commandeered, and preparations made for a meal. The victuals soon caused a crowd to assemble, and the natives were much attracted by a tin of jam, which they unsuccessfully endeavoured to purchase. Pushing on again, the enjoyment of the ride for the next few miles was marred by tyre trouble. This made it impossible to reach Tripoli before dark, so it was decided to stop at the next town *en route*. This proved to be Batroun, a picturesque little place, a jumble of red-tiled roofs, but civilisation was represented by "The Palace Hotel"—accommodation at five piastres (1s.) a night. Helping themselves to someone's door, the riders used it as a ramp to run their machines into a shop underneath the hotel. Washing was a most trying ceremony. A small Arab boy poured water from a bowl, and this was splashed on to the face with the hands, previously soaped. After an evening spent mainly in testing the edible qualities of the local fruit, a return to the hotel was made. The room which had been allotted to the motor cyclists was fairly clean, except for one minor discomfort incidental to the hot countries! As no illumination was provided by the management, an acetylene light was fixed up with a generator off one of the machines. This phenomenon attracted some other residents of the hotel to the room, and, as everyone had plenty to say, an enjoyable time was spent.

The hotel breakfast consisted of bully beef, onions, tomatoes, and maize bread, and at 10.30 a fresh start was made amidst a crowd of curious natives and others. The road for some distance was cut in the side of the cliffs overhanging the sea, and tunnelled through the rock in places. The surrounding country was well wooded,

and the Lebanon mountains, reaching almost to the sea, made a picturesque background.

Oranges, grapes, and pomegranates were obtained at many of the small villages scattered along the roads.

The End of a Perfect Ride.

Two more punctures caused some delay, but Tripoli was reached soon after one o'clock. The town was rather dirty, and the only hotel which could be discovered was not too inviting, so the riders slept in the open by a convoy of lorries which happened to be there.

The journey was completed by a seventy-mile run the next day to Horns—150 miles from Beyrout. Horns is a miserable sort of place, so the D.R.'s did not find much there of interest, except some boxes of Verey lights and Roman candles, with which they celebrated Peace.

CHINA AND THE MOTOR CYCLE.

IT may seem absurd on the face of it to advance the claims of China as a country likely to be interested in motor cycles, especially as British organisation in our Dominions is not yet perfect. It is significant to learn, however, that Dr. Chao-Hsin-Chu, B.C.S., M.A., Consul-General of the Republic of China, was a recent visitor to the Hendee Manufacturing Co. There he expressed views on the tremendous advance his country is making, and advised business men to establish trade relations with Chinese merchants direct rather than through Japanese channels. Many thousands of motor cars are now being imported into China, and sooner or later motor cycles will be common in the big towns. Who will be the pioneers, the Britisher or the American?



Automatic Carburetters.

READERS on the lookout for an automatic motor cycle carburetter should not forget the Claudel-Hobson. I know S. F. Edge defined an automatic as a device which gave an incorrect mixture at all speeds, and I dare not quarrel with him, for my Claudel is not economical. But it is a workable one-lever proposition. It is quite the surest starter I have ever tried, and it will run a flat twin engine from as slow a tick as one can hope for in this vale of tears up to over 3,000 r.p.m. on one setting with an acceleration which I have only excelled on a Henderson. On the eve of the war, I was about to try out an Everest, of which I had heard as another sound one-lever notion.

Wanted, a British Four-cylinder.

THERE are plenty of rumours, of course, but actual evidence that any British four-cylinder motor cycle is going into production is hard to come by. I saw more than one during the war, but they were frankly experimental, and seem to have been dropped. On the question of policy I have two remarks to make. The first is that until sound four-wheeled cycle cars come along, lots of folk will pay very high prices for a sidecar outfit *de luxe*—witness the popularity of the big Clynos, Enfields, Matchless, and many Americans. A good four has the best V twin whacked to the wide, and if any designer disbelieves in the cycle car, the four is his obvious line. In the second place, the 1914 Henderson satisfied me that the four has very special fascinations as a solo mount, both for luxurious travel on rational lines, and as a hogbus.

Incorrigible.

WHILST I am orating about cycle cars, I must revive an old heresy of mine and say that modern belts have never received full justice. It is perfectly astonishing what present day belts will stand, provided they are big enough and are given sound joints. Over and over again I have eradicated belt troubles by fitting a rin. in lieu of a $\frac{3}{4}$ in. or resorting to a similar trifling increase in contact area. There are limits to this process on solo mounts because a very stiff belt will not hug a very small pulley affectionately. But on a cycle car the load is divided between two belts, the belt line is not particular to an inch or two, and you can use a front pulley of walloping diameter if desired. The obvious solution of jointing a cycle car belt has not been tried so far as I know. The three commonest belt troubles are fastener mishaps, stretch, and slip. On a cycle car you can dodge fastener troubles by manufacturing endless belts: you can cure stretch with a turnbuckle on a radius rod by spacing out the pulley centres instead of getting out guillotine, punch, etc.; as you are compelled to do on a bicycle for dread of raising the gear; while slip is practically unknown with rubber

belts which are up to their load and have rational pulleys and pulley centres. Of course, if the cycle car is going to weigh 10 cwt., belts are probably an absurdity; but the Morgan originally weighed no more than $2\frac{1}{4}$ cwt., and, after four and a half years of featherweight engineering, I do not see why a pretty capacious four-wheeler need tip the beam at more than 5 cwt. If I were a cycle car designer, instead of a paltry, blithering, penny-a-liner, I should try out modern belts on the above lines, and bribe Messrs. Ormerod to make up a few dozen feet of their patent Watawata belting in rubbered canvas core instead of leather; it hugs a pulley better than any solid belt can, and I have often wondered why it has only appeared in the leather type.

Two Unconventional Pedals.

I SEE one of our readers is anxious to try an accelerator pedal as an auxiliary to the standard handle-bar lever. I carried out this experiment in an idle moment some years ago, but found it of no particular interest. If it possessed any merit it was in sudden deceleration. The handle-bar lever is seldom within easy reach of a normal finger when the throttle is fully opened. Thus it was often a convenience to leave the handle in minimum position and begin a speed burst solely on pedal control; when an emergency developed or a slow down was desired the pedal was released. Still the advantage was much too trivial to justify the complication. On the other hand, I rather liked an auxiliary pedal valve lifter with which I have experimented more than once. It is conceivable that a pedal compression release, with rather a more liberal leak than the standard valve lifter affords, might be worth consideration. It was very useful for wheeling the machine in pre-clutch days, and provides a pleasant form of coasting.

A Leakproof Petrol Tap.

WE all dwelt under the illusion that our petrol systems were leakproof until the Connaught people brought our their petrol two-stroke. Other makers followed suit, and we began to notice that the average privately-owned petrol baby was freely smeared with a greenery-yallery ooze over a large zone radiating round the petrol pipe and carburetter. The more fastidious of us tested our pump-oiled four-strokes by staining the fuel with a little oil, and then began a series of frenzied tap grindings. But unless one was lucky, these small taps proved incorrigible, and we gradually resigned ourselves to wasting a percentage of our precious fuel at so much per gallon. Then the war came along and the minutest petrol leak in aeroplane installations caused pilots to do rapid-fire profanity, ask emmas to be crimed, Governments to wax hectic, and many lovable youths to go west what time the tracer bullet streaked through the leakage area, or a mild crash dipped a redhot exhaust pipe

Occasional Comments.—

in the ooze. Then Benton and Stone invented a new positively petrol-proof tap with a cork seating. I s'pose we're to have it on our peace model 'buses, eh! what?

Pressure Lubrication.

AS several correspondents have recently clamoured for pressure oiling of motor cycle engines, it needs to be stated that there are two formidable arguments against applying this system. The first is financial, the second prudential. From a designer's standpoint, it is the easiest thing in the world to force a stream of oil through hollow shafts, but you can't do it as cheaply as you can employ flywheel "churn" to fling oil into the ends of bushes; and when all is said and done, the best motor cycle has to be sold in keen competition. Secondly, the pump and splash system is as simple and reliable as a system can be. But the adoption of forced oiling would import grave possibilities of trouble. Such a system includes a maze of small-bore oilways, and a single decent-sized fragment of dirt at various crucial points would block the circuit, arrest the lubrication, and lead to a seizure. Can we trust even 90% of our riders to observe the precautions essential to cleanliness? Are all motor cycle lubricants sold in a perfectly clean condition? How do riders behave when their requests for gratis repairs are met with an accusation of "under-lubrication by the user?" Do we wish to drive half our manufacturers into lunatic asylums? Nobody but the correspondence section of a works office knows what idiots some users still are.

Rear Lights or Reflex Mirrors?

VOICING what is merely a personal opinion, I hope the country is too sane to return to an illogical law, whereby only those vehicles which were seldom overtaken had to carry rear lamps. Cycles, being unobtrusive and silent, are *par excellence* the vehicles for which rear warnings at night are logically indispensable. If a 3-ton lorry were excused a rear light, it looms so large and makes such a dust and noise and smell that it could hardly be rammed unless it stopped its engine and sat under some trees in a very narrow road in a thick fog. As universal rear lamps avert even this mild and improbable peril, they are ideally desirable. On the other hand, rear lamps are an abominable nuisance. On a car they are of the oil or electric variety: if oil, you light them and drive away—when the flame promptly rises, fills the lamp with pendulous carbon, suffocates itself, and lands you in the police courts; if electric, they hop off their brackets and trail along the road till the flex chafes through—in this case you pay your fine plus two guineas for a new lamp. On a motor cycle, the tail lamp is usually acetylene: you nip the gas tube unconsciously with your thigh, or the burner of the front lamp carbons up, and you pinch the rear lamp burner as a spare. On a push bicycle you have to pay from 10s. to 15s. for a sound tail lamp, which you can probably ill afford. So the only peaceable solution, in my opinion, is for all vehicles to carry ruby reflex mirrors: the good ones are as efficient as red lamps, and free from all their disadvantages, whilst the Government can easily fix a suitable standard of efficiency.

A Privately Built Three-wheeler.

IT is extremely difficult to design a small three-wheeler if it is to look well on the road—a point which many professional designers appreciate. However, a Middlesex reader appears to have been fairly successful in producing a runabout approximating to the sidecar in size, weight, and appearance.

Built in spare time during the past three years by Mr. J. A. Payne, of Hayes, the little machine illustrated is a long way ahead of most amateur efforts; in fact, we have seen many marketed vehicles of this type which, on the score of finish and appearance, do not compare favourably with it.

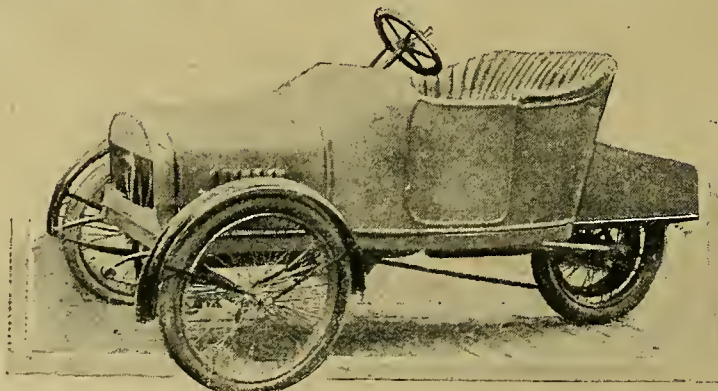
The track of the machine is 4ft. and the wheelbase 5ft., while the power unit is a 6 h.p. twin Rex engine with overhead inlets, which is placed across the frame and is started by means of a handle in front. Five forward speeds and a reverse are obtained by a fric-

tion disc immediately behind the engine, the final drive being by 1½in. Whittle belt from an adjustable pulley. The steering is by rack and pinion.

The body is constructed of aluminium on ash framing, the rear wheel cover being hinged to facilitate tyre repair, etc. Tanks for three gallons of petrol and two quarts of oil are arranged under the scuttle dash.

Personally, we think it somewhat daring for an amateur constructor to embody friction drive, as this type of transmission does not, as a rule, give the most satisfactory service unless installed by experts in this particular line. Mr. Payne may give us particulars of his ex-

perience in this direction a little later, which should prove of great interest, as the friction transmission provides the most simple form of gear change for vehicles of this type. The final belt drive should be fairly satisfactory if the small pulley is not too small.



A RUNABOUT WITH ALUMINIUM BODY.

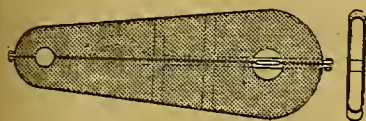
A "home made" cycle car built by Mr. J. A. Payne, Hayes, and fitted with a 1911 pattern 5-6 h.p. Rex engine. Friction discs and a Whittle belt are employed.



A BATCH OF PATENTS

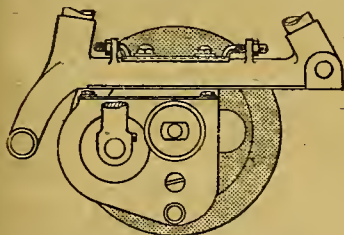


It is, of course, too early for us to expect specifications of all the designers' post-war notions, but a batch of some two dozen patents now before me shows that brains are being profitably expended on some of our minor needs. Half a dozen stand to the credit of Mr. G. E. Rigby, who is responsible for the Royal Ruby.



Rigby's patent chain cover. Patent No. 121,371. 28/12/17.

He is out for leaf springing fore and aft, and has taken to heart the complaints which riders make about chain adjustment. For example, the average rear chain is difficult to expose, since its case must be rigidly mounted if rattles are to be avoided. So Mr. Rigby proposes to secure a skeleton cage of strip metal or stiff wire firmly to the machine, and to slip a quick-detachable cover over the cage. Or again, a gear box is often hung from four studs threaded through slots in



Rigby's gear box adjustment. Patent No. 121,099. 2/8/18.

a bracket, and secured by nuts above the bracket. Chain adjustment is performed by slacking four more or less accessible nuts and clamping the gear box to and fro with a mallet, and as the bolts must be a free fit in the slots alignment is often lost. Under Mr. Rigby's patent the rider tightens his chain by slacking one nut and tightening another, having first loosened the nuts of the clamping stud, whilst alignment is infallibly maintained.



Monie's patent. No. 118,331. 25/8/17.

Give me a Scotchman for thoroughness. The picture of Mr. M. M. Monie's rear wheel puncture preventer is self-explanatory. He naively states in his claim that the idea was inspired by sustaining forty-seven punctures in 11,000 miles. After fitting the protector he rode 10,500 miles and "over 25,000

nails" (to quote from the patent specification) without punctures. But what about the dust, Mr. Monie?

Mr. C. T. B. Sangster has a real novelty in disc wheels. He anchors the off and near side discs to each other and to the wheel by means of the meat hook clips, using radial wire spokes instead of the tangent pattern. Then he fixes the sprocket or belt pulley directly to one of the discs, so that a disc takes the drive. I cannot imagine one of these discs becoming loose, which is more than can be said of most types.

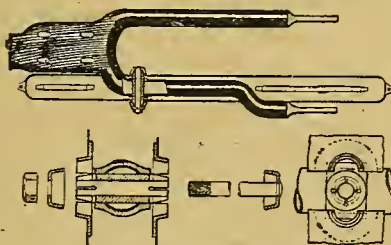


Sangster's wheel discs. Patent No. 111,428. 4/5/17.

The New Hudson Co. have a new gadget for fitting brake or clutch pedals on spring footboards without straining the Bowden wire connections. This is obviously better than confronting the driver with a footrest which keeps varying its position in relation to the pedals, and should be valuable on "baby" machines, where the weight of a fully sprung frame is prohibitive. The Clyno designers have two patents of interest, both relating to detail. As outlined above, Mr. Rigby, of Royal Ruby fame, considers that a chain case should be (1) quickly detachable and (2) rattleproof.

The Chain Case Problem.

The Clyno thinkers are rank cynics on this matter. They imply that detachability and silence are incompatible ideals, and suggest a rider, "What about oil leaks?" M.G.C. experience and Scottish trials have made them pessimistic, and where chain cases are concerned they agree with the philosopher who told us when we found a true friend to grapple him to our soul with links of steel. So

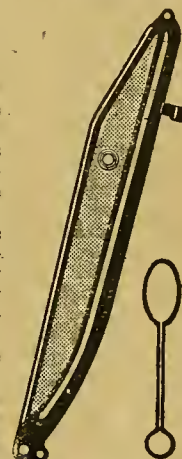


The Clyno gear case fixing. Patent No. 117,763. 21/11/17.

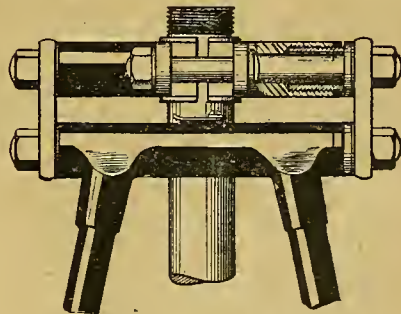
their chain case clip goes as follows: A hollow cone split by sawcuts is brazed to each side of the chain stay. A hollow half cone is formed on both sides of each half of the chain case. These pairs of half-

cones fit snugly over the cones on the stays. Hollow conical caps slip over the assemblies, and a threaded bolt is then passed through the lot, and drawn up tightly with a nut. I do not remember Frank Smith losing a chain case in a big trial, but he has evidently encountered dirty work at the cross roads some time or other.

Mr. W. H. Osborne is specially interested in front forks. He stamps or presses each side of a trussed fork of very pleasing appearance from one piece of metal, as indicated in the side view and the section. This should be as strong as it is handsome. Moreover, he recognises that, though a fork of the Druid type is devoid of lateral sway when new, it may easily develop a degree of side rock in prolonged use, since the inner face of each link end rubs against the boss through which the spindle is threaded. So he proposes to insert adjustable collars or bushes at one end of each spindle bearing, whereby wear can be taken up, and the fork kept laterally steady.



Osborne's sheet metal fork. Patent No. 118,920. 22/9/17.

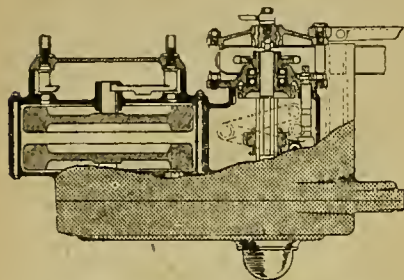


Osborne's improvements in linked forks. Patent No. 119,889. 12/9/17.

I have been led to believe by artists, interneers, and others that Holland is a very flat country, but now—on purely circumstantial evidence, mind you—I advise the A.C.U. to hold the next Six Days there. The Dutch gradients are terrific. How do I make that out? Very simply. Mr. Cornelis Willem Kuijper points out that if the transmission of a motor cycle brake snaps or becomes otherwise deranged, you cannot put the brake on. In his opinion it is far better that such a fracture should make it impossible to take the brake off. So he mounts a drum on the hub, and slips a multi-twist

A Batch of Patents.—

helical spring of immense power inside it. A spring-catch control lever or pedal is provided, which normally holds the spring compressed inside the drum; on releasing the control, the spring expands with a bang against the interior of the drum; and of course if the Bowden con-



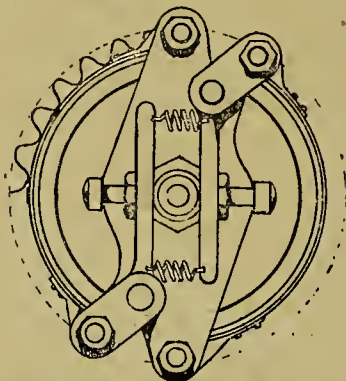
The James gear box and crank case layout.
Patent No. 121,231. 25/2/18.

nection snaps or a nut falls off a coupling rod, the same occurs—the brake is hard in, pending repairs. Frankly, I could not drive a machine fitted with the Willem Kuiper brake: the thought of its suddenly going hard on when I was doing sixty would make me wake in a cold sweat o' nights. Hold hard! Is this our old friend Billy Cooper pulling our legs, *more suo*? Does anybody know if he has been interned?

More power to the James Co. It has dawned on them that high-powered machines are chiefly used with sidecars, and that the modern sidecar, being usually a cross between an Admiralty buoy, a Canadian canoe, and a Sedan chair, is apt to obstruct accessibility to

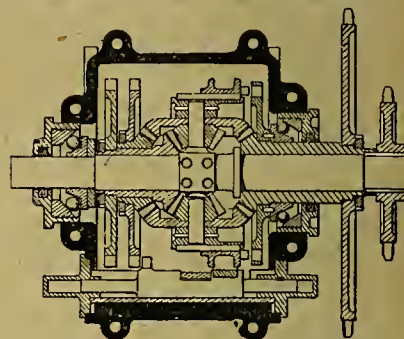
the left-hand side of the motor cycle. So they are redesigning their cycles with this thought in mind. Not content with mounting the more vulnerable items, such as carburettors and contact breakers, on the right—a simple trick which has already occurred to commoner minds than theirs—they have envisaged a true ideal, *i.e.*, that if you tilt the bicycle over towards the right, all its inside should slide out. They have not fully attained this height in their present patent, but they are climbing towards it. They construct their gear box and crank case in the likeness of cupboards: you just take off the right-hand end plates and remove their innards. Very nice, too!

A Swiss firm, the Conder Manufacturing Co., have patented a two-speed gear which looks unusually foolproof on paper. The gear box is of the two-speed dog clutch type, so familiar on the earlier Douglas machines. The countershaft



The band brakes on a Swiss gear box.
Patent No. 114,413. 14/12/17.

sprocket, driven by the engine, is provided with a drum, on which are two clutches of the brake band variety. These two clutches are so coupled to the gear shifting mechanism that one of them is tightened when a gear is engaged, and that both are free when the gears are in neutral. Thus the movement of a



A. T. Collier's gear box. Patent
No. 121,406. 22/2/18.

single lever controls the clutches and the gears. This is the first foolproof dog-clutch gear I have encountered. Its value in practice will obviously depend on the ease with which the clutches can be adjusted and their durability. A naked external band clutch of small area does not look too promising for motor cycle purposes at first sight.

Mr. A. T. Collier's gear is of the bevel pinion epicyclic type, but, unlike its predecessor, the Nala hub, provides three ratios, there being two sun wheels engaging planet pinions of different diameters, the gear revolving solid on top. The Nala hub proved reliable in use, but was heavy.

B.H.D.

TECHNICAL ABBREVIATIONS.

Notes on some Little Things that Mystify the Novice.

THERE are many things that puzzle the novice, when first entering the ranks of potential motor cyclists by reading *The Motor Cycle*, and not the least among them are the technical abbreviations which are frequently mentioned in the context and advertisements. There are hundreds of potential newcomers to the pastime who know little of mechanics, and it is for their benefit that this page is penned in the form of a glossary of terms most commonly used.

Flat Twin.—Now almost generally used as the type name of the horizontally-opposed two-cylinder engine.

Cyl.—Cylinder.

O.B. Sidecar.—Coachbuilt.

K.S.—Kick-starter—a pedal for starting the engine.

h.b.c.—Handle-bar control.

F.B.—Footboards.

F.R.—Footrests.

Combination.—A trade designation of a sidecar outfit.

Amp.-hour.—An electrical term denoting the capacity of an accumulator.

Single-speed.—One gear ratio only.

Two-speed.—Two gear ratios (and so on).

Hub Gear.—A gear contained in rear hub, usually of the epicyclic type.

Planetary Gears.—Epicyclic.

c.c.—Cubic centimetres—usually used to denote the capacity of the space swept by the piston, or pistons, of an engine.

Bore.—The diameter of the cylinder.

Stroke.—The length of travel of the piston.

mm.—Millimetre. The metric system is used in most engine dimensions. Also by tyre makers in connection with tyres made to suit car type rims.

Revs.—An abbreviation for revolutions.

Revving.—A coined word, meaning revving.

Clutch.—A device by which the engine is gradually connected up to the driving mechanism of the road wheel. Also called a free engine.

Mag.—Short for magneto.

a.c.—Air-cooled.

w.c.—Water-cooled.

a.o.i.v.—Automatically operated inlet valve, or atmospheric valve—a valve opened by vacuum before it or pressure behind it.

m.o.i.v.—Mechanically operated inlet valve.

m.p.g.—Miles per gallon.

m.p.h.—Miles per hour.

r.p.m.—Revolutions per minute.

f.e.—An abbreviation used chiefly by advertisers in the miscellaneous columns to denote that a machine is fitted with a clutch (free engine).

h.p.—Horse-power.

b.h.p.—Brake horse-power. The actual power developed on the "brake," *i.e.*, the testing machine.

i.h.p.—The horse-power shown by an indicator during tests.

n.h.p.—Nominal horse-power, *i.e.*, the power given by the manufacturers as approximate.

Countershaft.—Denotes that a machine is fitted with a gear box between the engine and road wheel.

T.T.—Tourist Trophy. Sometimes used to signify type of machine, *i.e.*, a semi-racing mount on the lines of the machines used in the Tourist Trophy Races.

Two-stroke.—Sometimes erroneously termed two-cycle. An engine completing its cycle of operations in two strokes of the piston—one up and one down. Usually a valveless engine.

Four-stroke.—Sometimes erroneously termed four-cycle. An engine completing its cycle of operations in four strokes of the piston—induction, compression, power, exhaust.

Historic Fact.

THE first British Motor Cycle used in the war by the French and Italian armies was the TRIUMPH, but the British Armies soon insisted that the entire output of the famous TRIUMPH Motor Cycles should be reserved to them and them alone.

This is the finest tribute that can be paid to the production of any manufacturer, and affords incontrovertible proof of the sterling merits of

TRIUMPH

Motor Cycles.

The 1919 Models, which are exact replicas of those which have proved their efficiency in every respect in all the war zones, may now be obtained at the following prices :

4 h.p. Type H.	.. ..	£87
2½ h.p. Type L.W.	.. ..	£54

TRIUMPH CYCLE CO., LTD.,
COVENTRY.

London: 218, Great Portland Street, W.1.
Also at Leeds, Manchester, and Glasgow.
(The Company has nearly 2,000 Agents in the British Isles to attend to the wishes and needs of Motor Cyc'ists.)



ANY means of getting from one place to another by road should provide comfort, interest, and speed at a reasonable cost, without the introduction of mechanism which is delicate or difficult to understand.

The G.N., departing from the conventional in many respects, does so with excellent reason; it was originated by H. R. Godfrey and A. G. F. Nash over ten years ago, and is the outcome of their experience and continued progress in design; its simplicity and lightness make it a vehicle of high-performance, with economy in both first cost and running.

**G.N., Ltd., Etna Works,
Albert Road,
Hendon,
N.W.4**

To Motor Cycle Manufacturers.

A firm of repute with large Machine Shops and Foundries, employing 750 hands, are manufacturing a Patent

TWO-STROKE Motor Cycle Engine

which will revolutionise the trade.

Enquiries are solicited from prospective purchasers of Engines only.

Estimated Output :

**250 ENGINES
PER WEEK.**

At an extremely low price.

Box No. 2,987, c/o "The Motor Cycle."

Raymond

In answering these advertisements it is desirable to mention "The Motor Cycle."

FROM KILIMANJARO to NYASA

The Story of
a Great Trek
of 250 Motor
Cycle
Cavalry
through the
East
African
Jungle.



The very
Strenuous
Conditions
there Over-
come prove
British
Machines
Unbeatable
for Work
Overseas.

Reminiscences by (Rev.) F. J. Ashley, formerly Chaplain and Capt. S.A.M.C.C.

The first part of the story—published last week—deals with the journey from Voi to Moschi, and leaves the column on their ninety miles' journey to Lol Kisale.

THE Colonel sent an officer ahead with despatches, and I went with him for company. The first part of the seventy miles' ride was along the side of the mountain range, with the cliff for a wall on the left and a precipice on the right, and it was seldom possible to see far ahead. The officer led, I followed, and three of his men rode behind me. He set a rattling pace, and I did not like it. What I feared came to pass. On rounding a bend I saw at a glance that the wall had fallen down, leaving a narrow space on the edge in which the leader was wedged. I was going a good twenty, if not more; jammed on the brake and stood on the pedal, skidded, and in a flash was over the edge. Fortunately a bush some twenty feet below pulled me up, and as the cliff was a little out of the perpendicular we were able to drag the machine up, and found it had no damage beyond two nuts loosened, while I had a few bruises. After that we travelled under brake control. The remaining ten miles into Kondoa were a nightmare struggle through sand as soft and deep as that on a seashore.

Attacked by Bees.

Some little riding was done between the kopje we occupied later and the town, a distance of about $2\frac{1}{2}$ miles. I was threading my way back to the kopje one day when I suddenly came on a machine lying overturned on the edge of a donga. It was in full view of the kopje, and only four hundred yards distant from it. I could not understand it, for it was rank heresy to leave a machine thus, and if it had been an accident it would have been observed. I saw several figures moving about the kopje. I shouted; there was no answer. I called the number of the machine! still silence; but, just as I was going to look over the edge of the donga, there came a loud "Buzz-z-z," and the next moment my machine was lying in com-

pany with the other and I could not be seen for dust as I legged it down the track, slapping at every sting I received. A hive in a neighbouring baobab tree had been robbed of its honey, and the bees were waiting for anyone who came along. I had to get a mosquito net and put two pairs of socks over my hands before I could go back for my machine, and the bees covered my net in a cloud till I left the tree well behind.

A Crash!

One of our Q.M. sergeants had not long arrived and had a curious tale to tell. He with another man set out from Moschi after the corps, and some twenty miles out missed the road and went off down a native track. After several miles the track seemed to peter out, and they knew then they were wrong. Unfortunately this man developed malaria and was not fit to go on, having become partially delirious.

The next morning the poor fellow was unable to move, so the Q.M.S. started on foot along a small path which, according to the lie of the country, would strike the Aruscha-Moschi road. He reached it after a tramp of some five hours, and was fortunate enough to meet a bullock waggon on transport duty. After getting refreshment he started back with water bottles full and reached his camp at night. The next morning the sufferer was able to travel, and they picked their way back and got on to the right road. There was a comical finish. The invalid was still feverish and rode erratically with the Q.M.S. behind him to pick him up when he fell. Suddenly a green tent came into view surrounded by canvas chairs, washstands, and other impedimenta of officers not belonging to fighting units. To his horror the Q.M.S. saw the other swerve once or twice and then head straight through the grass for the tent. He crashed into it, bringing everything down in ruins amidst the sound of decanters and bottles falling and volleys of oaths. The

From Kilimanjaro to Nyasa.—

Q.M.S. waited for no more but opened his throttle fully and flew past to a safe distance and then pulled up. Presently the swaying rider appeared.

"What did they say?" demanded the Q.M.S.

"Oh! they swore a good bit," muttered the other with dull eyes and a flushed face.

"And what did *you* say?"

"Oh! I asked them if this was the way to Lol Kisale!"

We had now developed a strong respect and affection for our mounts, which seemed able to stand any amount of rough usage and hard knocks. In this connection a motor cyclist riding up a path alongside a donga with an 80 lb. drum of oil on his carrier skidded over the edge and dropped fifteen feet. Even the carrier did not give way. The carriers, though, were the weak parts of the machines, but they were never designed to be subjected to such work as we were forced to give them, since we had to travel self-contained.

section and he, tired of the eternal flour and water "damper," determined to make some "fat cookies"—a South African delicacy of flour cooked in fat. The fat they used was Mobiloil A!

"But didn't it half kill you?"

"It gave us heartburn for a bit, sir!"

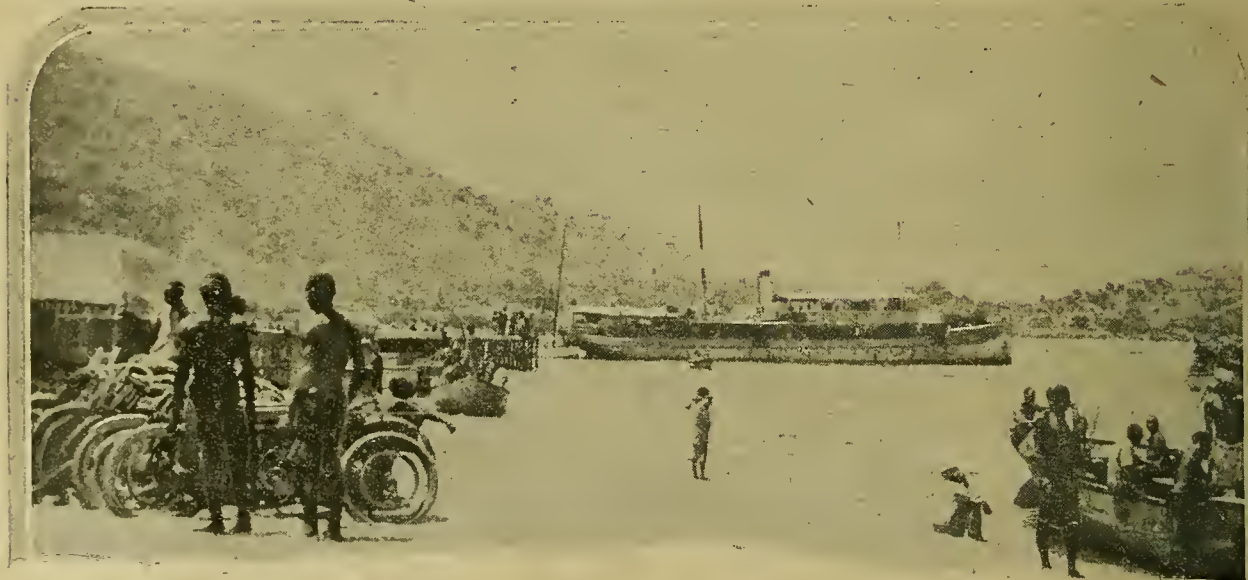
And I have memories of Kilossa on that score. The doc. and I had five ducks' eggs given to us by a friendly native, and we handed them over to our orderlies to cook and then dreamed dreams. We hadn't had eggs, it seemed to us, for years.

"It's ready, sir! We've made an omelette."

And they had, but it was made with cocoanut oil! That was one of the most cruel disappointments I've ever had. The doc. stamped off beyond speech, but, eggs being eggs, I ate some of the omelette, and it was a week before I lost the taste of cocoanut oil.

Doctored Machines.

It was here a fault-finding competition was devised. Each platoon entered three men, and three machines



Natives embarking motor cycles on H.M.T. "Chancy Maples," Mbamba Bay, Lake Nyasa.

Riding under a hot sun, over such roads and carrying such loads, threw a great strain on the engine and gear box, but they stood it nobly. An officer told me when he returned from a trip back to Moschi that the roads were so badly ground into dust that a car travelling threw up a wave before its radiator like those from the bows of a steamer. On one stretch of seventy miles he never once got out of low gear, and in that space used a tank of oil. It seemed tall, but we did many similar things later. Perhaps the greatest expenditure was on spokes, the all-chain mounts being the greatest offenders. The adjutant told me, towards the end of the campaign, we had got through over a hundred gross of them. On reckoning it up I well believe it.

The humorous side of things was always to be seen. Even the short rations could not altogether depress the men. How desperate was our plight can be pictured by what my batman told me one day when I complimented him on his cooking. He said that his half-

were "doctored" by the mechanics. The Colonel's machine was one, and for a first trial the carburetter had water poured into it. When the first competitor was called from the hut he came forward, put his hand on the plug and gave a vigorous dig to the kick-starter to test the spark. To our surprise the engine started, and there was a roar of laughter during which the man retired thinking his leg had been badly pulled. The explanation was, of course, that the petrol flowed to the jet without entering the float chamber.

On another machine the brush at the end of the high-tension wire was removed, but that engine started, too, the spark jumping from the slip ring to the end of the wire which was fitted a little way into the opening to conceal the fault.

One man I know would have been glad of such a live mag., for he was discovered by the roadside bemoaning the fact that he could only get a spark from two points of his plug and not all three. He was a recent addition, I might add.

From Kilmanjaro to Nyasa.—

At Kidek one platoon rode into a force of 3,000 men waiting for our division, and when fire was opened upon them the leading men thought their engines were missing and backfiring, and only on glancing down and behind did they see the spurts of dust. They left their machines hurriedly enough then to get under cover. One of them said after that what worried him most was to lie there and see the petrol dripping from tank and jet, because petrol was so scarce that orders had been issued threatening severe penalties on any man wasting it.

The enemy were a little too confident, however. They captured two of our men escorting a ration party and threw their B.S.A.'s over a high bank down on to a rocky river bed, which happened to be dry. Natives reported their whereabouts, giving us in graphic pantomime the idea that they were smashed up. But through

experience we thought B.S.A.'s were not so easily smashed, and two cyclists were sent out carrying two more men pillion fashion. If they could be towed back the various uninjured parts would be useful as spares. The machines, however, came back under their own power.

Our last ride when we left the country, Kigonsera to Mbamba Bay, deserves a chapter to itself, and I cannot hope properly to describe it in less. Briefly, it was a "road" the engineers had not tackled, and we had only the native path through the Livingstone Range to follow. It was the rainy season, and we had to overcome mud, rocks, rivers with no bridges, and thick bush, taking three and a half days to do fifty miles. It was an epitome of all we had encountered except sand, and we were glad to walk over that to embark on the steamer that carried us down to Nyasaland.

IMPROVING A 7 h.p. TWIN.

Details of Some Minor Alterations which gave added Efficiency.

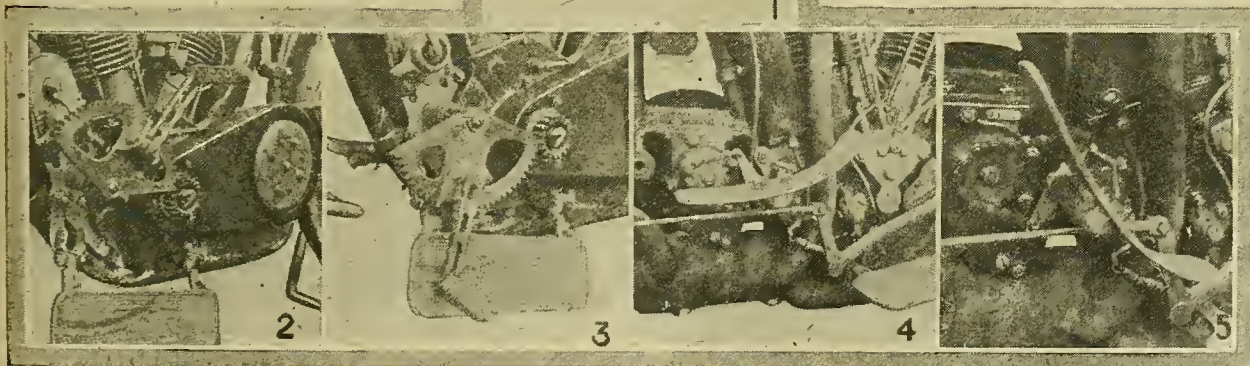
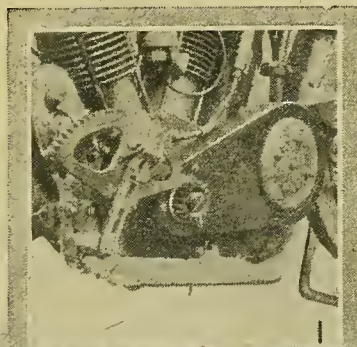
SOME considerable gain in convenience has been obtained by the owner of an Indian motor cycle, Mr. H. A. T. Stanton, A.M.I.E.E., of 4, Ainslie Street, Barrow, from the small yet effective alterations described. As these alterations refer to kick-starter and clutch mechanisms, possibly the ideas embodied therein may be of value to riders of other machines.

The kick-starter, chain wheel, engine sprocket, and chain were replaced by a new quadrant and sprocket, as shown in figs. 1, 2, and 3, giving a ratio of 4 to 1 between quadrant and sprocket in place of the previous ratio of 3.17 to 1. This increase in ratio enables the engine to be turned both further and quicker for a given kick, and, with the larger kick stroke obtainable with the new quadrant by hinging the footboard to drop clear (figs. 2 and 3), the engine starts at the first kick. The new sprocket has radial teeth arranged to fit the existing ones on the engine-shaft. It has a light spring in front which perfectly ensures engagement of these teeth when the sprocket is driven forward by the quadrant, and permits the latter to return to the "ready" position, when the sprocket is driven backwards.

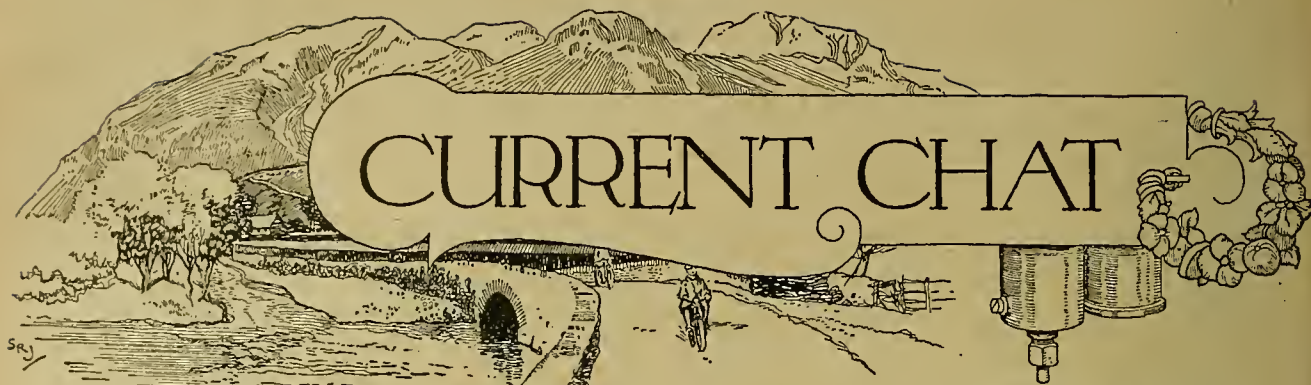
Another point concerns the clutch, which the owner found somewhat difficult to adjust. When sufficiently tight it was never really free in the "out" position; and conversely when adjusted to be free it slipped on hills. A diagnosis showed the defect to be due to inadequate movement of the clutch pedal.

The near-side pedal, with its many connecting rods and levers, was therefore replaced by a new off-side pedal mounted close to the gear box, as in figs. 4 and 5. The clutch rod, which projects from the off-side of the gear box, was fitted with a chain wheel in place of the existing lever, and the new pedal connected directly to the chain wheel by a length of $\frac{1}{8}$ in. bicycle chain. This pedal was supported by a new bracket fixed to two existing engine bolts, and by means of a slot for one of these bolts the bracket can be swung to adjust the chain.

The writer wishes to say, in anticipation of these improvements appealing to riders of similar mounts, that no alterations whatever to any existing parts are involved, and that he is willing to supply the drawings to anyone desiring them.



(1) Kick-starter in normal (i.e., housed) position. (2) Kick-starter ready for use. (3) Starter in position at finish of kick stroke. (4) Clutch pedal in position. (5) Clutch pedal in the "out" position.



Times to Light Lamps.

GREENWICH TIME.

Mar. 6th	...	...	6.16 p.m.
" 8th	...	...	6.19 "
" 10th	...	...	6.23 "
" 12th	...	...	6.26 "

French Racing Track.

An immense motor racing track in the neighbourhood of Paris is proposed.

The 50 lb. Machine.

Our U.S. contemporary, *Motor Cycle and Bicycle Illustrated*, announces the new A.B.C. in the following headline: "Four Speeds—50 lb.—160 Miles per Hour."

Roads in the North.

A correspondent in Inverness asserts that the main north road has ruts so deep that the footboards of his machine were touching the edges as he proceeded along the road.

Speed Limits.

An agitation has been started in Toronto for the raising of the speed limits in the province of Ontario. The Provincial Legislature will be asked to increase the limit from 20 to 25 m.p.h. in the country, and from 15 to 20 m.p.h. in the cities.

Petrol.

There is apparently considerable delay in obtaining petrol licences by direct application to the P.C.D., so that motor cyclists are advised to send their particulars to one of the associations dealing with the question.

The Automobile Association, Farnham House, Whitcomb Street, London, W.C.2, has been able to arrange the issue of hundreds of licences within twenty-four hours to applicants, whether members of the Association or not.

The Industrial Reconstruction Council.

A conference on "Labour Conditions in Relation to Future Industrial Prosperity" will be held under the auspices of the Industrial Reconstruction Council on Tuesday, March 11th, at 6 p.m., in the Hall of the Institute of Journalists, 2 and 4, Tudor Street, E.C.4. The chair will be taken by Maj. the Hon. Waldorf Astor, M.P., and the opening address delivered by Capt. James O'Grady, M.P., secretary of the National Federation of General Workers. No tickets are necessary.

Summer Time.

The morning of Sunday, March 30th, will mark the commencement of Summer Time, which will continue until the night of Sunday-Monday, September 28-29.

Annual General Meeting of the A.C.U.

We have already stated that the annual general meeting of the A.C.U. is to be held at Birmingham. The date has been fixed for March 22nd, the meeting to take place in the afternoon at the Digbeth Institute.

"Rich Mixture."

We are in receipt of the Souvenir number of an excellent publication, entitled *Rich Mixture*, which is written and illustrated almost entirely by officers, N.C.O.'s, and men of the Home Mechanical Transport Depot, R.A.S.C. The profits on the sale of the Souvenir go to St. Dunstan's Home for the Blind.

Rich Mixture contains much that is interesting, and much that is amusing; its illustrations are clever, and the motor cyclist R.A.S.C. is not ignored. Most people think that the R.A.S.C. had a soft job at the Front, but many instances are given of the great dangers to which the men were constantly exposed.

Special Features.

A BATCH OF PATENTS.

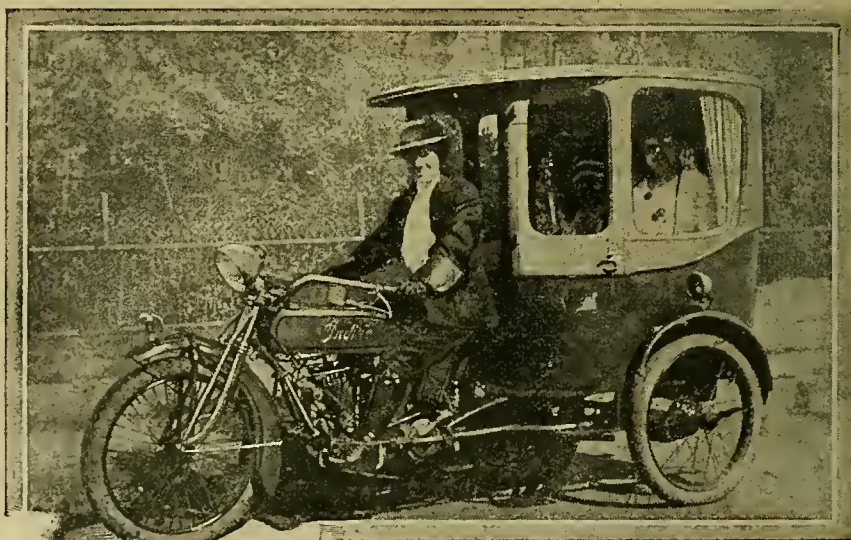
250 MILES RIDE IN THE HOLY LAND.
1919 MODELS.

Priming Pipe Design.

A reader points out that his priming pipe had a deep curve in it, and, realising that the petrol lay in the loop and got stale, he shortened the pipe and made it run directly from the tap union to the compression tap. He now finds that the starting is much easier, as fresh petrol is injected every time.

After Many Days.

That the Germans have taken care of various mails they have captured is proved by a letter shown to us by Mr W. Carson, of Bayliss, Thomas and Co. (British Excelsior). It was posted in Copenhagen on December 9th, 1916, and arrived in England on January 21st, 1919. The envelope was opened and resealed by the German authorities, and also by the British Censor, who marked it "Part of a mail captured by the Germans and delayed."



The vogue of the three-wheeler of the Morgan type has not yet reached America, although the three-track passenger outfit illustrated has gained a limited popularity. The driver, however, is exposed to the weather with this outfit, which compares unfavourably on many points with the fully-equipped double-seated sidecar.

Second-hand Prices.

The second-hand market has apparently passed its zenith, and the average of the prices asked is becoming slightly less week by week. The following list gives the average of the prices advertised in *The Motor Cycle* of February 20th and 27th for second-hand machines:

	Previous to 1914.	1914 and 1915.	1916 and 1917.
A.J.S., 6 h.p.	—	—	£78
A.J.S., 2½ h.p.	—	£40	—
Allon, 2½ h.p.	—	£33	—
Bat, 6-8 h.p., and sidecar	—	£65	—
B.S.A., 4½ h.p., and sidecar	—	£55	£82
Calthorpe-J.A.P., 2½ h.p.	—	£30	£35
Campion, 4 h.p., and sidecar	—	£41	—
Douglas, 2½ h.p.	£21	£44	£55
Enfield, 6 h.p., and sidecar	—	£60	£100
H.-Davidson, 7-9 h.p.	—	—	£100
H.-Davidson, 7-9 h.p., and sidecar	—	£105	—
Indian, 7-9 h.p.	—	£50	—
Indian, 7-9 h.p., and sidecar	—	£70	—
Matchless, 6-8 h.p., and sidecar	—	£80	—
New Hudson, 3½ h.p.	—	£40	—
Norton, 3½ h.p.	—	£70	—
Rover, 3½ h.p.	£30	£45	—
Sunbeam, 3½ h.p., and sidecar	—	£75	£85
Triumph, 4 h.p., sidecar	—	£45	—
Triumph, 3½ h.p.	£25	—	—
Zenith 4 h.p., sidecar	—	£37	—

Government Reply to the A.A.

The Secretary of the Treasury, in replying to the representations of the A.A., urging the removal of the super-tax of 6d. per gallon on petrol, said:

"(1.) That while their Lordships have refrained from extending the Excise duty to benzole, they have no power to waive the Statutory requirements of the Finance Act, 1916, covering the issue of fuel licences and the payment of duty for ordinary motor spirit.

"(2.) That they are unable to deal with the matter in advance of the general consideration of the Budget requirements of the year."

The energetic Automobile Association is not satisfied with this reply, and will continue to agitate for the abolition of "control" of motor fuel, the necessity for which no longer obtains, and the super-tax of 6d., which was imposed purely as war-time expedient.

Benzole.

A new company is to be formed to undertake the distribution of benzole. This fact was announced at a meeting held in London the other day to inaugurate the newly formed National Benzole Association, which is an association of benzole producers. Many distinguished persons were present at the gathering, and the President, Mr. D. Milne Watson, who is also president of the Gaslight and Coke Co., took the chair.

Mr. E. S. Shrapnell-Smith stated that the Board of Customs and the Treasury do not intend to impose the sixpence a gallon tax on benzole at the moment. He also declared that the consent of the Treasury and Board of Customs had been obtained for trial on a large scale of a mixture of 75% alcohol and 25% benzole on motor omnibuses in the London area, which is a big step in the right direction for fostering the use of home-produced fuel.

The significant announcement that at present benzole could not be sold at a less cost than petrol was made by the chairman.

A useful suggestion was put forward by Mr. E. S. Shrapnell-Smith that the motor-ing organisations should participate in the capitalisation of the new distribution company.

THE DISPOSAL OF ARMY MOTOR CYCLES.

No definite plan has yet been decided upon by the authorities as to the ultimate disposal of the bulk of surplus Government motor vehicles.

Prospective buyers of ex-W.D. motor cycles are advised to apply to the Controller of Mechanical Transport Disposal Department, 1, Grosvenor Place, London, S.W.1.

As it is impossible to announce sales beforehand, those interested in the sales at Aldridges should write to Aldridges' Repository, St. Martin's Lane, W.C.2.

Tyres on Lightweights.

Most of the 1919 lightweights have 26×2½ in. tyres instead of 26×2 in., which, in view of the present condition of the roads, is a step in the right direction.

Olympia Motor Cycle Show.

The Olympia motor car show being announced to open on November 7th, it may be taken as practically certain that the motor cycle show will be held about a fortnight after November 15th—the date the car show finishes.

The 4 h.p. Blackburne.

The Blackburne motor bicycle, referred to in the issue of February 27th, fitted with an engine 85 mm. × 88 mm., 499 c.c., is to be known as the 4 h.p.

Owing to a typographical error the wheelbase was mentioned in our description as being 4ft. 1in., while it is actually 4ft. 11in.

A Flat Twin Auxiliary.

We understand that the Johnson auxiliary motor, which was described in a recent issue, will be made in England under licence from the American company. It is said that an English officer, who lately returned from the States, has secured the British rights. It will be recalled that this auxiliary engine is a 1½ h.p. flat twin two-stroke, embodying a magneto fly-wheel, from which current is also obtained for the lamps.

Empire Trade Commissioner.

The Association of British Motor and Allied Manufacturers has appointed Major R. E. Goddard as its Overseas commissioner for the purpose of conducting a tour of investigation of the markets of Australasia, India, and the East.

Auction Sale of Fifty Motor Cycles.

Fifty motor cycles, together with accessories, are advertised to be sold by auction on Friday, March 7th, by Harry Reeman, auctioneer, Colchester. The advertisement in a daily newspaper states the sale will take place owing to "the termination of Government contracts."

The War Tax on Petrol will go.

As announced in last week's issue, the 6d. per gallon war tax on petrol may be removed shortly. The R.A.C. has been moving vigorously in this matter for some time, while the A.A., too, has had a lengthy correspondence with the Board of Trade and H.M. Treasury. Now the Motor Legislation Committee, composed of officials of the various motoring organisations, has sent a resolution to the Chancellor of the Exchequer and the Financial Secretary of the Treasury.

A Ministry of Ways and Communications.

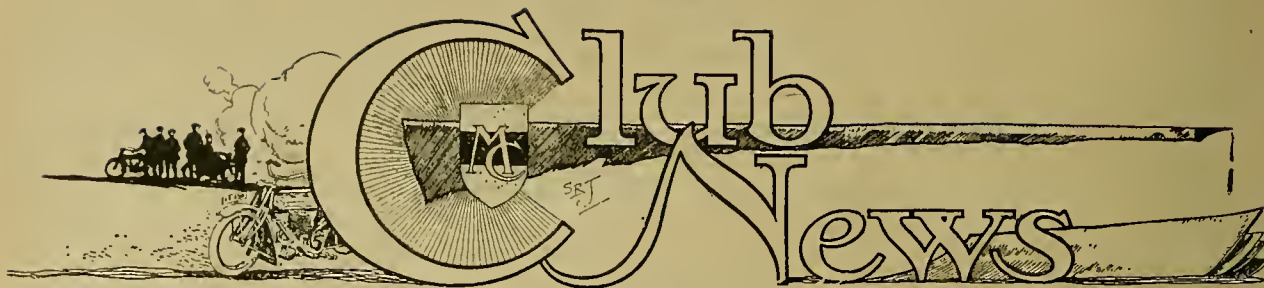
The proposed new Ministry of Ways and Communications, of which we have already spoken, is to be entrusted, it is suggested, with the control of railways, light railways, tramways, canals, roads, bridges, vehicular traffic regulations, and electric supply. Great opposition will be taken to the measure, for obviously the control of the roads should be a separate administration. *The Motor Cycle* and *The Autocar* and every motor organisation have strongly protested against the roads being controlled by a body of men whose main interests are in railways.

Mr. W. Joynson-Hicks, M.P., chairman of the Motor Legislation Committee, has forwarded to the Local Government Board a strong protest against any proposal which will place the roads under the same Ministry as railways and canals.

There are ample economical reasons against such a proposal, as the interests involved are in many cases quite opposed.

**THE FIRST WEEK IN MARCH.**

Contrary to the programme of the seasons, March came in "like a lamb," and many motor cyclists took advantage of the mild weather to picnic in the open.



Midland C. and A.C.

The motor cycle section sub-committee of the Midland Cycle and Athletic Club consists of Messrs. J. Webb, C. F. Dawes, Frank Whitworth, and R. H. Henderson, who will deal with the club's forthcoming sports meetings and motor cycle trials.

Woolwich, Plumstead, and District M.C.

As far as possible the 1914 fixture list will be carried out this year. An important non-stop trial is the 50 mile non-stop run to be held on April 6th, starting from Knockholt, Kent. Three prizes will be awarded, and entries will be received at the start, by the hon. secretary, Mr. F. J. Ellis, 3, Nightingale Place, Woolwich, S.E.18, from whom full particulars may be obtained.

Harrogate and District M.C.C.

This club has now been revived, and the old executive re-elected. The programme includes social events and competitions for motor cycles, light cars, and cycle cars. Special arrangements are made for visitors to the district, and reduced subscriptions for members resident outside a twenty-five mile radius. The hon. secretary is Mr. H. W. Fortune, St. James's Chambers, Cambridge Street, Harrogate.

Nottingham and District M.C.C.

This club has recently been re-organised, and many new members enrolled. A Challenge Trophy, value 100 guineas, has been offered by Mr. H. Bowden, of the Raleigh Cycle Co., Ltd., for which the competition will be open to all comers. The course will be a sporting one over parts of Nottinghamshire, Derbyshire, and Staffordshire. The Committee Meeting is to be held at the Welbeck Hotel, Nottingham, on the 7th inst., when it will be possibly decided to hold speed trials, on a road stretch that has already been selected.

The M.C.C.

Members of the M.C.C. are requested to read carefully the paragraphs relating to the M.C.C. in these columns, so that they may keep in touch with the club and its doings, and should necessity arise to communicate with the secretary, as the list of members and their addresses is undergoing revision.

The opening run will take place on April 6th to the Red Lion Hotel, Hatfield. Cold luncheon will be served there at 1 p.m. Those intending to be present at the lunch must send in their names at least a week beforehand to Mr. A. C. Armstrong, 7, Rosebery Avenue, London, E.C.1, as unless this is done places cannot be reserved for them.

Future Events.

Mar. 9.—N.M.C.F.U., Sheffield. Run to Hathersage.

Mar. 16.—N.M.C.F.U., Sheffield. Run to Blyth.

April 5.—Birmingham M.C.C. Opening Run.

April 6.—The M.C.C. Opening Run to Hatfield.

April 6.—Woolwich, Plumstead M.C. Non-stop Trial from Knockholt to Lamberhurst and Back.

April 13.—Liverpool M.C.C. Opening Run.

April 18.—Darlington B and M.C. Opening Run.

April 21.—Birmingham M.C.C. Easter Trials.

April 21.—Dublin M.C.C. Dunlop Cup Trial.

June 9.—Dublin M.C.C. Whit-Monday Trial.

June (end of).—Dublin M.C.C. Twenty-four Hours' Reliability Trial.

Aug. 2 and 4.—Dublin M.C.C. Two Days' Reliability Trial.

East Midland Centre A.C.U.

Several new clubs are being formed in the Nottingham area, due to the efforts of Mr. J. Simmonds, the hon. secretary, who will be pleased to hear from motor cyclists residing in Newark, Southwell, Mansfield, Worksop, Alfreton, Long Eaton, and Hucknall areas. His address is 10, Cranmer Street, Nottingham.

Birmingham M.C.C.

The Victory Cup open reliability trial for solo and passenger machines will be held on April 21st. The course will be 125 miles, and include several well-known test hills in the Midlands. There will be special conditions for low-power machines. The awards consist of three special silver cups: the Victory Cup for best performance by any machine; the Duke Cup for the second best performance; and the Evans Service Cup for the best performance by a member or ex-member (either sex) of H.M. Forces. In addition, there will be first and second-class awards, and, if sufficient entries, a special award for the best performance by a lady driver.

We shall be pleased to hear again from secretaries and others regarding existing and proposed clubs, their programmes, and any other interesting particulars. We are prepared to assist with advice and publicity those desirous of establishing clubs.

Coventry and Warwickshire M.C.

A meeting of the committee with the object of reviving this club was held on Tuesday evening last.

Manchester M.C.

A very busy year is anticipated for this club, comprising an Easter trial, hill-climbs, reliability trials, and gymkhanas. A meeting has been arranged for the 13th inst., at the Albion Hotel, Piccadilly, Manchester, to which all interested are invited. The hon. secretary is Mr. H. D. Ashworth, British Electron, Ltd., Hood St., Manchester.

Liverpool M.C.

A smoking concert will be held on March 19th, at St. Margaret's Hall, Parkway, Liverpool, which is free to all motorists. Tickets from the hon. secretary, Lt. N. Dean, 22, Ford Street, Liverpool.

The date of the opening run to Llangollen has been altered to April 13th. This run will embody an appearance competition, and lady members will act as judges.

There is no entrance fee to this club, and, for motor cyclists, the subscription is 21s. per annum, which includes the full benefits of the A.C.U.

M.C.C. for Kentish Town.

We are informed that it is intended to establish a motor cycle club in the Kentish Town district (N.W. London). Any motor cyclists in that part who are interested are invited to write to, or call on, Mr. W. C. Mison, 126, Kentish Town Road, London, N.W.5. As soon as sufficient applications have been received to warrant it, a meeting will be called for the purpose of electing the committee. The Club will be affiliated to the A.C.U.

A Motor Cycle Club for Blaenavon.

At a meeting of motor cyclists held in Blaenavon recently, it was decided to form a local motor cycle club. Those interested should communicate with the hon. secretary, Mr. B. R. Evans, 22, Glantorvaen Terrace, Blaenavon, Mon.

N.M.C.F.U.

Rapid strides are being made by the Leeds branch in an endeavour to become the premier section of the Union. Meetings have been held to discuss the fuel question, which have attracted a great deal of notice in the local press, and are likely to be of benefit in obtaining better and cheaper supplies of benzole. Sporting events, competitions, and club runs for the season are being arranged. The hon. secretary is Mr. T. W. Lancaster, of Evelyn Street, Chapeltown Road, Leeds. The next open meeting is on the 10th inst.

THE MOTOR CYCLISTS' PARLIAMENT.

An Appeal to all Riders for Combined Action. By Major S. R. Axford, O.B.E.

IT is curious, but various conversations I have held with motor cyclists show that there appears to be a hazy notion concerning the Auto-Cycle Union. Ask the average motor cyclist what the A.C.U. is and means, and he will probably reply: "Oh! the Auto-Cycle Union controls the sport and that sort of thing, you know!" anything more definite he is unable to mention.

Such is my excuse for dealing with the constitution, the activities, and the aims of the A.C.U., in this article.

It is not possible to treat the subject in more than a sketchy manner owing to the fact that an exhaustive treatise on this subject would fill many pages.

In the first place, it may be interesting to state that the A.C.U. is an offspring from the Royal Automobile Club. The R.A.C. was founded in 1897, as a society of encouragement for the motor and allied industries in the United Kingdom, and, being the supreme motoring authority in this country, represents the United Kingdom on the International Association of recognised automobile clubs.

The Aims and Objects.

In 1903, the R.A.C., with the concurrence of the National Cyclists' Union, formed the Auto-Cycle Club, now known as the Auto-Cycle Union, and this latter body represents the United Kingdom on the Federation Internationale des Clubs Motocyclistes.

The avowed objects of the Auto-Cycle Union are, and always have been: (a) to foster the pastime of motor cycling, and to act as a society of encouragement; (b) to safeguard the rights and privileges of members, and to take action, where advisable, in cases where general principles affecting the rights of motor cyclists are involved; (c) to provide a centre of information on motor cycling matters; (d) to make and administer rules and regulations for the government of motor cycle racing and other competitions.

Hitherto, I am afraid that the majority of motor cyclists, certainly the sporting element, have considered object (d) the Alpha and Omega of the A.C.U.'s duties. This is by no means so, for a careful perusal of object (a) will reveal a far greater aim, and one that in itself should clearly and insistently demand the material support of every motor cyclist. The obvious method of giving such support is to join the A.C.U., and from what I am privileged to know of the "plans of campaign," I can unhesitatingly assure those motor cyclists who are not yet members that to remain non-members is the greatest mistake possible—that is if they have the slightest interest in the development of the pastime, in its freedom from the tyranny of combines, or in obtaining redress from unfair legislation.

Membership is open, of course, to both ladies and gentlemen, and the benefits apply equally in England, Scotland, and Wales, and also Ireland except as regards the "Get you home" scheme.

Motor cyclists who are members of an affiliated club are in a very favourable position, as under Division B they get advantages which, as individual members,

they could not get for less than 10s. (Division B means that their club pays a capitation fee of 5s. per member.) Any member of an affiliated club may enjoy the full privileges of membership of the A.C.U., including the benefits of the "Get you home" scheme, etc., by an extra payment of 2s. 6d. This means that Division C, in which he would then be classified, offers to club members the full benefits, costing individual members 10s. at a cost of 7s. 6d., so there is obviously a great inducement for a member to join through a local affiliated club. This scheme should also appeal greatly to the clubs themselves, for it certainly is an incentive to the average motor cyclist to join his local club.

The officers of the A.C.U. consist of a president, vice-presidents, and a committee of forty-four members. The president and vice-presidents are, of course, *ex-officio* members of the committee.

Representations on the committee are as follows: Club members, 20; individual members, 12; and R.A.C. nominees, 12.

It will be seen therefore that the R.A.C. representatives have no actual controlling power, as they are in the minority, except, of course, their power as ordinary members of the committee.

There are seats for thirty-two absolute representatives of motor cyclists on the committee, and therefore if motor cyclists themselves will see that only the right men are elected the pastime should go ahead like steam.

Committee Nominations.

Before going further, it might be well to remind club secretaries of Rule 31, particularly with regard to the payment of capitation fees, for, unless they are paid as notified in Rule 15, clubs will find that they are not in a position to nominate members on the committee.

This rule disqualifying clubs from nominating members for the committee is perfectly fair, for it is a guarantee of good faith as to size of membership and consequent voting power.

Each club is entitled to one voting paper for each twenty-five members or portion thereof. Without the rule before-mentioned it would, of course, be possible for an optimistic club secretary to estimate his club membership at an absurdly high figure. Payment of capitation fees on his estimate is a steady influence.

It is proposed that in future the committee shall meet *en plein* every other month, and at different provincial centres as well as London. The railway fares of committeemen will be paid by the A.C.U. These meetings will be open to the press. I certainly think that the quorum should not be less than fifteen, as it is obvious that much work must be done by sub-committees, which should have executive powers within their terms of reference, and it would be unwise that the quorum of the General Committee should be too small in such circumstances for obvious reasons. It should also be ruled that at least two members of the Management Committee must be present at meetings of a sub-committee before their decisions can become executive ones.

To give a sub-committee executive powers would mean a great speeding up, and the interminable process of referring recommendations to the Management and General Committees, etc., with its waste of time, would be eliminated.

The Birmingham Meeting.

Before dealing with the annual general meeting to be held in Birmingham on March 22nd, I would like to make it quite clear that the management and financial control of the Union is vested *solely* in the committee, which means that, if a poor standard of nominees is elected, motor cyclists will surely rue it. On the other hand, if a sound energetic committee results, things will surely "move."

The old system whereby the annual general meeting had executive power was hopelessly wrong, for it obviously needed but a few "Bolshevists" to attend *en masse*, and by a snatch vote wreck the whole policy and constitution of the Union. It would be as reasonable to call a meeting of the electorate of the United Kingdom to reverse Acts of Parliament.

I can see a most interesting period ahead, a period moreover in which the fighting organisation only will obtain its end.

Therefore, the genial personality—if he has no other qualifications—is useless on the committee. Every motor cyclist has his chance at the annual general meeting of deciding who shall fight for him; therefore, in heaven's name, elect fighters! The man who sits at the committee table like a deaf mute (and who does not know this type) is not the man wanted. Bear in mind that I am not thinking of any particular individuals for whom I am either for or against. I only wish to emphasise the principle that negative personalities are far worse than useless—they fill the place of more fit men.

I am not, of course, suggesting that my remarks are not labouring the obvious, but I offer no apology for them, inasmuch as the lethargy of most humans is well known, but if I can spur even 50% of the motor cyclists of Great Britain to take a lively interest in their own welfare I shall consider my efforts approaching sublime heights of accomplishment.

As a last word, therefore, may I urge all motor cyclists—whether members or not—who can possibly attend the annual general meeting to do so.

Clubs must forward the names of nominees to reach the A.C.U. offices by March 15th.

Annual general meeting at the Digbeth Institute at Birmingham March 22nd.

Individual members' annual meeting at Birmingham March 22nd.

Results of election to be published by the A.C.U. before April 5th.

First meeting of new committee to be held on April 17th.

It is also intended that after the annual general meeting at Birmingham on the 22nd the meeting should be thrown open to the whole motor cycling public, when many world-renowned motor cyclists will speak. Motor cyclists should determine, by hook or by crook, to attend this victory meeting.

THE METRO-TYLER LIGHTWEIGHTS.

Two Examples of a 295 c.c. Two-stroke.



The touring model Metro-Tyler two-stroke. The sporting model, fitted with disc wheels and dropped handle-bars.

WE announced some time ago that the Tyler Apparatus Co., Ltd., Banister Road, N. Kensington, and the Metro Two-stroke Co., had joined forces. The first results of the amalgamation are the two new lightweights illustrated here. One of these is a single-gear, sporting model, with disc wheels which give it a very distinctive appearance, and the other a more conventional machine with two-speed gear.

The bore and stroke of the Metro engine are 70 mm. and 77 mm. respec-

tively, which give a capacity of 296 c.c. It is of the usual three-port type, with a three-ring piston. Die-cast white metal bearings are used for the crankshaft and "big-end." These bearings are inexpensive and, owing to their simple design, easy to renew.

Lubrication is carried out by means of a Best and Lloyd sight-feed pump on the tank which supplies oil direct to the induction pipe, whence it is carried by suction to the cylinder walls, the crankshaft bearings being fed from the base

of the cylinder through vertical oil ducts drilled on the side of the crank case.

The mudguarding, both at the front and rear wheels, is well carried out, while the specification of both models includes Brampton Biflex forks, Lycett's pan saddle, 26 x 2½ Clincher tyres. Both machines are enamelled dark red, which is relieved by black lines. Prices range from £46 for the single-speed model without wheel discs to £54 10s., the price of the sports model with disc wheels and two-speed gear.

THE 1919 RADCO.

An Efficient Two-stroke Lightweight.

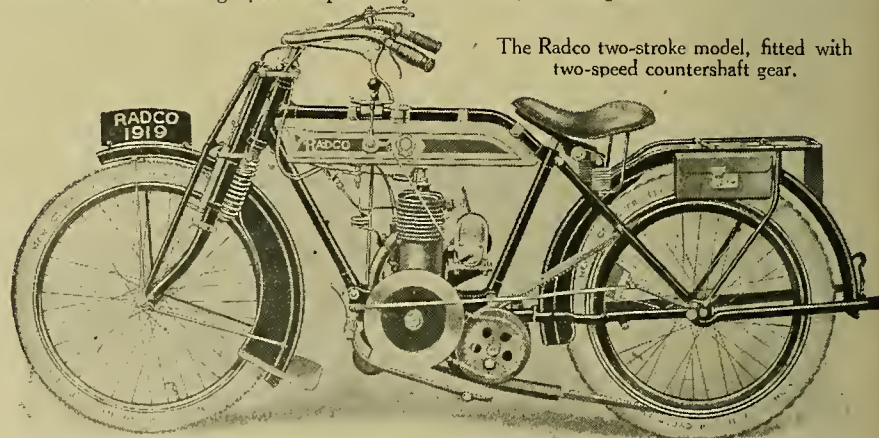
ONE of the best known of the lower-priced lightweights before the war was the 2½ h.p. Radco, which, despite its exceedingly low price, was quite an efficient little machine. For example, we recall that it was entered in several competitions, and almost invariably obtained an award. This consistent good running of the engine may have been responsible for the honour it received by being copied so closely by a well-known American concern.

The 1919 model is very little altered, except that Druid forks are now fitted in place of the more simple Radco type embodied in the earlier models, while the weight is approximately 100 lb. 26 x 2in. wheels with beaded edge Clincher de Luxe tyres are standard.

With the exception of the magneto, the engine and its equipment remain as before. The bore and stroke are 62 mm. and 70 mm., the capacity being 211 c.c. The lubrication is by sight drip feed, the

oil being carried to the induction pipe. The single-speed and two-speed models are offered at 36 and 43 guineas respectively.

The makers are Messrs. E. A. Radnall and Co., Vauxhall Works, Dartmouth Street, Birmingham.



The Radco two-stroke model, fitted with two-speed countershaft gear.

ROAD REPORTS.

WE have received the following information as to the condition of certain roads:

The road from Uxbridge to Ealing is reported by a reader to be the worst he has yet traversed, and is one long stretch of pot-holes of varying size for the whole distance.

Alcester-Wellington, *via* Bromsgrove, Kidderminster, and Bridgnorth.—Very fair.

Stratford-Alcester.—Bad.

Wellington-Whitchurch.—Good, last few miles in perfect condition.

Whitchurch-Warrington, *via* Tarporley.—Good.

Windsor-Oxford, *via* Henley and Benson.—Good, especially near Henley.

Oxford-Stratford-on-Avon.—Fair, but a few miles are bad.

The Lake District, Newby Bridge to Windermere.—Fair, broken in places.

Windermere to Ambleside.—Fair, rather bumpy.

Ambleside to Grasmere.—Fair, very greasy in wet weather.

Grasmere to Keswick.—Good all the way.

Keswick to Penrith, *via* Greystones.—Very good.

Kendal to Bowness, *via* Crook.—Excellent.

Penrith to Shap village.—Very good, except for one or two short stretches.

Shap to Shap summit.—Excellent.

Shap summit to Kendal.—Very bad indeed.

A reader requires information concerning the road from Inverness to Wick.

Another reader requires information as to the state of the roads in North Somersetshire generally.

SOME SNAGS FOR CLUB SECRETARIES.

Problems connected with the Preparation of a Sporting Programme.

FOREWORD. Now that the clubs are coming to life so rapidly and vigorously, the time has come when the club officials must take stock of present conditions and rule their actions accordingly, and the policy of the principal events will have to be studied from an entirely different viewpoint from that of 1914. The following article shows how at least one wideawake club secretary has tackled the problem.

ANY couple of motor cyclists foregather so chummily at a chance meeting on the road that the running of a successful club looks the easiest job in the world. In actual practice, no secretary occupies a bed of roses, and a few warnings from an old hand may be of service to provincial clubs just starting or restarting.

In the first place, a large membership is essential and is difficult to obtain in small towns. Numbers are requisite for several reasons. In the first place, the annual budget will be quite imposing, and plenty of subscriptions alone can preserve the club from bankruptcy: niggardliness in running competitions and social events is a great damper. In the second place, motor cyclists are drawn from all strata of society and do not necessarily mix well. Their womenfolk are often like oil and water, and in these days of sidecars and cycle cars you must make the club attractive to the fair sex. If the average attendance at a club fixture consists of ten men who do not know each other, except by sight, and six women who do not want to know each other, the club will be a wash-out. An average attendance of sixteen implies a paper membership of 100 in many localities. On the other hand if you can count on an average attendance of thirty, the various little cliques—even of petticoats—can dissolve into their own eddies when required. But an average attendance of thirty implies either a paper membership of 200 or a very keen membership of 100, shepherded and coaxed by a super-efficient secretary.

Two Problems.

Having founded your club and secured your membership, you are beset by two practical problems:

- (a) To satisfy your keen members.
- (b) To make your slack members keen.

It is a toss-up which problem is the more difficult. Amongst your keen members you have riders who want a competition every week (some of them want it on early closing day, others on Saturday): riders who want social runs to a tea house thirty miles away at 20 m.p.h., and riders who want "scraps" at 35 m.p.h. to a public house eighty miles away; members of each of these two sets are variously at leisure on Thursday and on Saturday. When you have a competition, 75% of the riders quarrel about the management, timekeeping, conditions, and prizes: when there is no competition, half the men blaze away to the tea destination and the rest complain of their unsociability. The next week you put the captain in the van and forbid anybody to pass him, whereupon the hot heads whisper about a Sunday school treat. You require the tact of an archangel, the patience of Job, the ruthlessness of Hindenburg, and a dash of George Robey to weld the outfit into a contented family. But, generally speaking, you will gradually build up a satisfactory club if you can avoid serious trouble over the competitions.

A Fifty-guinea Cup.

There are two main snags in this connection. The local M.P. will probably give you a fifty-guinea cup, which will be the *pièce de résistance* amongst a catalogue of small fry, ranging from copper kettles to sparking plugs. That fifty-guinea cup may lead the secretary of the A.C.U. to mark your town on his map as "unclubbable." Only one man can win it per season, but, when he has won it, all the rest will contend that they ought to have won it. The organisation of the big event must be cast iron, waterproof, swindle-tight. Get Ebbelwhite to time it, S. F. Edge to judge it, and a large posse of Scotland Yard men to O.K. the non-stops. Otherwise you will privately bribe the local Bill Sikes to pinch that cup during the next winter.

Secondly, it is well to avoid reliance on inexperienced local helpers in competitions, unless you are a shrewd judge of men. In the consumption trial, for instance, Elijah Simkins puts up a record of 432 m.p.g., and you discover that he is going to marry the sister of your volunteer marshal, who was responsible for measuring exactly a quart into every rider's tank. Also take a strong line about such things as weather. You have no hill suitable for the climbing championship within forty miles. You select a hill forty miles away, and on the appointed day it rains cats and dogs. Out of twenty-three entrants eight turn up. Shall you run the climb off or not? If you did not make it clear beforehand that the event will be held wet or fine, the committee will probably declare it null and void, and the riders who braved the elements and scooped the pool will resign.

The Social Side.

The social side of club life is even more exhausting, because motor cycling is essentially unsociable. There is no real pleasure in touring in crowds, and conversation is not too easy *à deux* on a sidecar: many a happy home has been wrecked because Angelina asked Edwin to repeat a remark made from a superior altitude of 3ft. with a pipe in his mouth and a coat collar turned up to his ears. My own view of these difficult matters is that a club run should consist of a rendezvous, where members may inspect machines; a go-as-you-please tour to a common destination—let the speed-irons try to average forty, and the potterers burble along at fifteen; and tea together, preferably at a show place, where the riders may swap yarns, make acquaintances, try their machines up a hill, and visit an old castle or inspect Mr. Profiteer's prize shorthorns.

The conversion of slack members into active members is a thorny task, but must be faced. Make them feel that the club fixtures are worth attending and what they miss by absence: make them see the members missed them, and hope they are coming next week. When at last they do turn out, treat them as if they were your personal guests, and as if you were responsible for their entertainment.



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

WOODEN MODELS.

Sir,—May I point out that there is a slight error in your report of the paper on motor cycles, which I gave before the I.A.E. recently. The very excellent wooden models of frames were not used to illustrate the paper, but were produced and exhibited by Mr. M. Peters in the subsequent discussion.

I shall be glad if you will kindly insert this correction, as I consider that Mr. Peters is deserving of considerable credit for the introduction of a really useful method of examining frame design.

D. S. HEATHER, B.Sc., A.M.I.A.E.

REPORTING THE T.T. FROM THE AIR.

Sir,—May I use a little of your valuable space to give "Road Rider" my opinions on "Reporting the T.T. from the air."

Certainly his suggestion of conveying the reports and photographs from Douglas to Coventry by air is quite brilliant, but I should like to see anyone developing plates in a DH9, especially if it were "bumpy"! I should also like to see literary representatives with their aluminium typewriters carefully making out their reports amidst the din of four 400 h.p. Liberty engines, or even one in the case of the DH9!

If he intends to take photographs of the race from the air, I can assure him his efforts would not meet with much approval. Just an ordinary aerial photograph with a few little dots along the road would represent the complete Isle of Man T.T., all of which could be got on one plate. Of course, I may have taken the wrong idea about the photographs. "Road Rider" may not mean aerial ones.

He says, "poor visibility" is a sad nuisance in long-distance daylight flying. In five years improved instruments should render the aerial navigator master of almost all conceivable weather conditions." However improved the instruments will be, they cannot improve the weather itself, and so render the aerial navigator a "master."

In conclusion, I for one would not like to have 'planes zooming overhead during a race!

R.A.F. OBSERVER.

Southport.

ALUMINIUM COOLING.

Sir,—Permit me to thank your correspondent, Mr. E. Russell (page 167), for a half-hour's amusement. I venture to think that this emotion will be shared by many of your readers, when it is pointed out that his letter inevitably implies that neither Mr. Lanchester nor myself had heard of coefficients of expansion, or that we had entirely failed to take into consideration the effect of such factors!

"Any method," says Mr. Russell, "of casting or shrinking the ribs over a barrel is bad." He then proceeds to explain that his method is to cast the one on to the other! How this abolishes the (alleged serious) difference between the coefficients of expansion is not explained.

Would it not appear that, supposing differential expansion to have the serious effects he alleges, the metal at the roots of his ins must necessarily be in an extreme state of tension—a condition aggravated by every additional degree of working temperature, and tending, especially under vibration, to distortion and rupture?

To revert to those alleged defects in the most successful and extensively-applied system yet evolved, it would be interesting to know upon what basis Mr. Russell's very sweeping statements are made. I may have to bow to Mr. R.'s technical authority, but regret to say that his name is previously unknown to me. Will he therefore be good

enough to inform us how many instances he has personally verified of the aluminium parting from the iron liner; the types of engines, system of fitting, degree of separation, percentage of the "great loss of cooling effect" (*sic*), etc.?

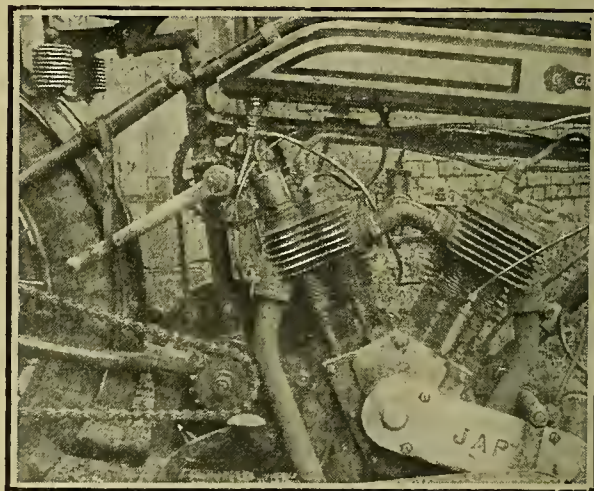
That a cylinder made as illustrated would have a neat appearance is apparent. That it would prove superior to an all-iron cylinder, under equal conditions, is most probable. That it may prove a serious addition to two-stroke improvement is, in my opinion, quite improbable; no attempt being made to utilise two of the most valuable properties of the metal, and a basic principle, vital to success on any considerable scale, being totally ignored.

I may be permitted to remark that I have never seen or heard of a case of looseness or of impaired heat-transmission as described by Mr. Russell. Further, upon the data and experience of nearly a quarter of a century, I have grounds for suspecting that this defect in my technical education may never be removed, so far as my own work is concerned, even should I continue to use those "bad" methods which are really so superior, practically and theoretically, to the illusive "improvement" illustrated on page 167. The latter design is quite all right for what it is and so far as it goes, but its efficiency will not be improved by the belated discovery of the nests of mares that foaled over a score of years ago.

R. AYTON.

HOME-MADE VAPORISER.

Sir,—I am forwarding you a photograph of my 8 h.p. Grandex-Jap, with a vaporiser of my own make over the rear exhaust valve, which I think will be useful to some of your readers. I have given it a good testing on a previous mount of mine, a 3 h.p. twin Enfield with light sidecar,



A valve cap vaporiser used by Mr. G. Frid.

on which I used paraffin only, all through the bad weather of 1916 and 1917, and I got splendid results. I am also getting a big saving on the Jap. On a run from Ponders End to Sudbury, in Suffolk, and back, with my wife and three children, the youngest being five years old, I did the 139 miles on three gallons and one pint of war spirit.

I hope this will be of interest and useful to others.

G. FRID.

DETACHABLE CYLINDER HEADS.

Sir,—We were very much interested in "Ixion's" comments *re* the above, in your issue of the 13th ult. It is true that many manufacturers are coquetting with the detachable cylinder head: indeed, we notice that two of the leading manufacturers have definitely decided to adopt the detachable cylinder head on their new models. On the Blackburne engine we have fitted detachable cylinder heads for a great many years, and, unlike other manufacturers, we have never abandoned them in favour of the solid cylinder.

The question of the design of a suitable head, however, is not entirely simple, and a great deal of time and thought was spent before we arrived at the design now adopted as standard on all Blackburne engines. This point we would strongly emphasize, as many people seem to be under the impression that it is merely a case of putting a "lid" on a cylinder, so to speak, whereas there are many snags and pitfalls to be avoided. The stresses set up in a casting of this peculiar shape have to be carefully studied, and we claim that our present design of cylinder head is one of the outstanding features of the Blackburne engine.

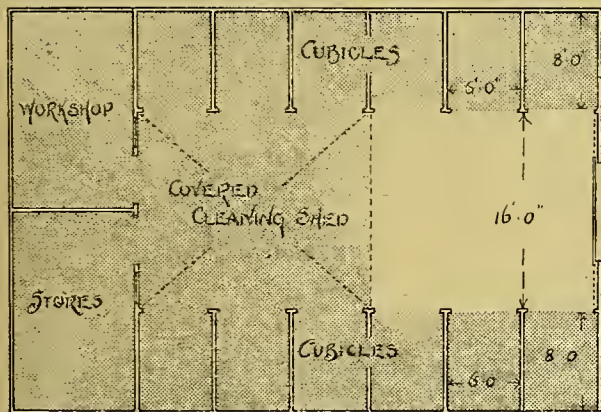
With regard to "Ixion's" remark that "amateur owners experienced difficulty in remaking the joint," may we say that our correspondence files do not indicate that owners of Blackburne machines have had trouble in this direction.

BURNEY AND BLACKBURNE, LTD.

G. Leivers, A.M.I.Mech.E., Director.

COMMUNAL GARAGES.

Sir,—Being greatly interested in the article by "F.A.S." entitled "The Motor Cycle, where to keep it," published in your issue of January 2nd, 1919, I have been keenly disappointed at the very meagre attention which seems to have been given the subject raised, viz., "Communal Garages." I reside in an industrial centre (notorious for its smoke and the steels which have made so important an advance in metallurgy) and the houses follow the same law as appertains to other industrial districts—the crowding of as many houses as possible on each acre of land. These



Plan of a communal garage suggested by Mr. W. Wright.

houses are built in rows and have no convenience for storing any mechanical contrivance, not even a push cycle, when not in use. The possibilities of communal garages appealed to me very much, and being connected with a union having a local membership of 800 I lost no time in bringing the subject forward, with the result that we placed it on our immediate programme, and anticipate having at least one communal garage in each district, where each member can have his own cubicle, a covered-in shed for common use to clean and make other necessary adjustments from time to time, and a stores where motor fuel, oil, and other accessories can be obtained as required; also, a well-equipped workshop, where any small replacement can be made, will be added where circumstances permit. This is rather an ambitious programme, but with the organisation we have already in Sheffield it should be fairly easy of accomplishment. We already distribute benzole on these lines, having one or more stewards in each district, who receive the benzole and distribute it locally. These stewards would have charge of the stores and workshop. It would scarcely be necessary to stock more than, say, 100 galls. of benzole, 10 galls. of oil,

and one tyre each of the sizes mostly asked for, as it is only a question of a few days to obtain renewals and other accessories. Those of our members who do not need a cubicle would have the benefit of communal trading in motor fuel, oil, and other accessories, the use of the workshop, and cleaning appliances, etc.; last but not least the advice and help of the experts who are always found in every group of motor cyclists. This matter has been fully discussed and will be commenced as soon as we settle the details of expenditure, etc. In outline I imagine the plan of the communal garages as in the accompanying sketch.

W. WRIGHT.

RUSTLESS STEEL.

Sir,—Your correspondent E. W. Walford appears to be misinformed about the mechanical properties of this steel.

He quotes it as having an ultimate tensile strength of about forty tons. Like all alloy steels its mechanical properties can be widely varied by heat treatment. Rustless steel can quite readily be given an ultimate tensile strength of 100 tons by water or oil hardening from 900°C.

Mr. Walford is also mistaken when he says that this steel is nearly as good as tungsten steel in regard to pitting and absence of deformation when used for exhaust valves. It is considerably better. I have seen two exhaust valves, one made from rustless steel and one made from the tungsten steel previously used, which had both been run in the same engine (Rolls Royce) for an equal length of time. The tungsten steel valve was badly pitted on the stem and cracked on the seating and also scaled, whereas the rustless steel valve was not appreciably affected. This observation relating to the two valves is, I believe, merely an instance of experience which was quite general during the last year or two of the war.

The only respect in which tungsten steel has proved superior to rustless steel is its greater strength at very high temperatures. By suitable modifications in composition, for this purpose rustless steel has been made quite as strong as tungsten steel at high temperatures.

LEO. T. BREARLEY,

The Firth-Brearley Stainless Steel Syndicate, Ltd.

THE ADVANTAGES OF A TWO-STROKE.

Sir,—Apparently "Enquirer" has taken F. W. Varney's ecstatic effusion *re* his Levis as an accurate guide by which to measure his own requirements.

Average speeds of thirty-five with sidecar and forty-five solo are possible with a 2½ h.p. Levis under one condition only—downhill. I suggest to "F.W.V." that a new speedometer might register his m.p.h. with more certainty.

"Enquirer" will with experience discover that for efficient and care-free dual purposes a cubic capacity of approximately 600 is necessary. A 500 c.c. will admittedly give excellent service; but, you old hands, what of that long, stiff gradient, heavy surface, head wind and rain, and a konk out halfway with two fair passengers? And—ugh!—requesting them to place their dear little feet in the mud and walk to the top. The American designer who doles out 1,000 c.c. knows something of meagre capacity engines.

A. STANLEY BLICK.

WHAT SHALL WE WEAR?

Sir,—I am afraid that the article by Miss Gardener is calculated to discourage women motor cyclists more than anything I have ever read. As clothed in her excessive bundle of oddments, she seems to have suffered everything, from chilled fingers to water trickling down her back and on to her legs from her lap.

Now, I have ridden a Douglas and a small Enfield during the last two winters, and have not experienced any of these things. I wear an ordinary man's short, double-breasted Burberry and high boots, lined gauntlet gloves, and ordinary velour hat, with a ribbon under the chin. The rest of my clothes I do not change for motor cycling. I always wear short skirts. For my journeys (including one on February 5th, in the snow) I can dress myself in five minutes easily. In warm weather I wear shoes, stockings, and ordinary clothes.

In the summer it is exhilarating and glorious to feel the air going right through all one's clothes. I consider it is the greatest mistake to dress up excessively for motor cycling. Use as little modification to one's ordinary clothes as possible, is my advice, and find out by experience in each individual case what you feel you want.

(Miss) PHYLLIS VERNON.

MOTOR CYCLES FOR THE MAIMED.

Sir,—I should be glad to know from any other reader of *The Motor Cycle*, who has a disabled, stiffened, or amputated right leg, what make or makes (and their horse-power) have no right-foot controls.

I am anxious to get a second-hand 2½-3½ h.p. two-stroke, but if none is quite suitable I should like a 3½ to 6 h.p. four-stroke.

I am a reader of your journal, and I may tell you that it gives me three or four evenings' delightful reading every week.

DEVEREUSE H. WHYTE.

MAKERS AND PROMPT SERVICE.

Sir,—In your issue of Feb. 13th I noticed that "G.R." was worried by the fact that he wanted to cancel his order for a machine, and the firm he ordered it from refused to cancel it. I should like first to state my experience in that direction.

Two months ago I ordered a Big 4 Norton sidecar from Messrs. Godfreys, Ltd., to be delivered this February. Only thirty days ago I discovered that I should have to cancel the order as I have to go out East. I wrote Messrs. Godfreys and asked if they would cancel the order, and explained why. By return of post I received a very courteous letter and also a cheque for £5, the deposit I paid in December. This difference in treatment, I think, well illustrates the difference in firms. I do not know from which firm "G.R." ordered his machine, but I think I know where he will go for another machine when he wants one. I was treated exceptionally well by Messrs. Godfreys, and I have no interest in the firm whatever, except that of a prospective customer. When possible I shall go straight to them for my machine.

W. T. VIZER-HARMER (LIEUT.).

Sir,—I should like to endorse the letter of "Lieut." in your issue for February 6th. I have dealt with the Hendee Co. for nearly two years, and nothing can exceed the promptness and politeness of their business methods. I have never ordered a spare part without receiving it by return of post. Just before Christmas I wished to fit disc wheels to my machine, and wrote on Monday, December 23rd, asking them, if possible, to send them at once. They were in my house with all necessary screws, nuts, etc., on Thursday evening. I think such treatment deserves recognition by those who enjoy it.

L. ENSELL.

Sir,—I should like to bring before your notice the way in which Messrs. H. Collier and Sons, Ltd., 44, Plumstead Road, Plumstead, London, S.E., have treated me. I purchased from them some months back a pair of ball races and had no occasion to use them, having sold the motor cycle. I wrote them returning the ball races and asking them to allow me what they thought best. I was agreeably surprised to find they refunded me the full amount, namely, 19/6. I think this is a most businesslike and satisfactory way to treat customers, and hope other readers of your paper have had the same experience.

This firm never hangs up orders for spares if no remittance is sent to cover, but helps one by despatching immediately. Perhaps you will be able to mention this in your paper.

J. H. GARDINER.

THE GRADUAL PAYMENT SYSTEM.

Sir,—I have recently been in communication with two of the leading motor cycle dealers, namely, Rider Troward and Godfrey, and both have informed me of the discontinuance of their gradual payment systems, both stating that this is due to the shortage of second-hand machines.

This action will rob many ex-soldiers of the joys of the open road this forthcoming summer at least. Returning from Army life with only a few pounds in their pockets, many must be left to gaze enviously at the munition worker with his £140 combination, whereas the continuance of the gradual payment system would have given them opportunity to get hold of a modest 'bus and enjoy the delights of motor cycling.

During the past two years, whilst the restraining hand of "Dora" has been upon us, dealers have been only too glad to sell on any terms, and many munition workers and such have been paying towards the purchase of a mount, but we unfortunate souls who were in khaki had no opportunity of this, and now, when at last we are able again to take up the threads of a peaceful existence, up go the prices, and the schemes that would have enabled us to materialise our long-

looked-forward-to dreams have vanished, and we are left kicking about "busless" whilst our more fortunate brethren are speeding away on the roads and over the country for which we did our humble best.

Is there a grateful and reliable dealer who will accept an order for a decent second-hand combination on the usual easy payment terms?

Wishing you every success, and thanking you for keeping us posted in motor matters whilst we squared up things over there,

F.E.H.B.

Manchester.

REPAIRING BROKEN CYLINDERS.

Sir,—Referring to the article which appeared in your issue of Feb. 13th, describing some repairs and improvements carried out on a Premier motor cycle, your contributor appears to be labouring under some misapprehension. He states, in regard to the broken cylinders which he so skilfully managed to repair, that "welding was out of the question, the broken portions of the combustion head being missing." We replace combustion heads in such conditions, however bad, and, although the work obviously calls for more than the ordinary amount of skill, there is no difficulty about it. We often have cases of four-cylinder engines in which three out of the four combustion heads have been entirely broken away, whilst instances in which two heads are gone are almost commonplace.

We fully appreciate the resource and ingenuity exhibited in carrying out the work described in the article, and we are sure your contributor will not mind our putting him right upon this point. We think, indeed, the information may be both of value and interest, not only to him, but to your readers in general. We may add that we have in hand at this present moment several cases of damaged motor cycle engines, the breakages in many instances being of precisely the same character as those in which your contributor thinks that welding is out of the question.

THE NEW WELDING CO.

NOISY MOTOR CYCLES.

Sir,—In your issue of February 6th you give an extract from *The Times* that the motor cycle is abominably and unnecessarily noisy. At any rate, the first adjective expresses public opinion. Although I am an engineer and take a great interest in motor cycles, I cannot deny that *The Times* statement is correct. I have passed many hundreds of motor cycles on the roads at different times, and there is only one single-cylinder machine (Sunbeam) that in my opinion does not make an undue noise. Occasionally a P. and M. is in this category for quietness. There is another make with a single-cylinder that makes a hideous row, and I asked at the local agency why the machines always make such a noise, and the man agreed that the machines in question did make a perfect racket. I would prohibit such machines from using the road.

Manufacturers must remember that it is not in their interest to cater only for youths and so-called speed merchants, who often consider that noise is speed. Public opinion is worth considering when it can be cultivated by efficient silencers and intelligent design. Of course, every manufacturer will think his machine quiet, but the fact remains that motor cycles are, in the main, abominably and unnecessarily noisy, and a general nuisance in this respect.

Manchester

G.F.S.

[Other machines than those mentioned are entirely satisfactory in respect of silence.—ED.]

BOOKS FOR MOTOR CYCLISTS**MOTOR CYCLES AND HOW TO MANAGE THEM.**

The recognised standard text book of the motor cycle: deals with all types of machines and with every part of the machine. 400 illustrations.

Price 2/6 net. By post, 2/10.

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A valuable collection of useful "wrinkles" and items of information concerning the running, management, and repair of motor cycles.

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Motor Cycle Faults, Their Identification, and Their Remedies Fully Explained.

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or of leading Booksellers and Railway Bookstalls.

QUESTIONS AND REPLIES

Magneto Brushes.

Does a Bosch magneto require attention as regards carbon brushes? I have been advised to take mine apart and put in new brushes, although the machine has never given any trouble, and I think it best to leave well alone.—E.D.

The brush on the collector ring, to which the high-tension wire is connected, is liable to wear or break. It may be examined without difficulty by screwing the vulcanite terminal out. If there is plenty of carbon left, it does not require renewing. The end of the brush should be either flat or slightly concave in section, and may be trimmed up with fine sandpaper.

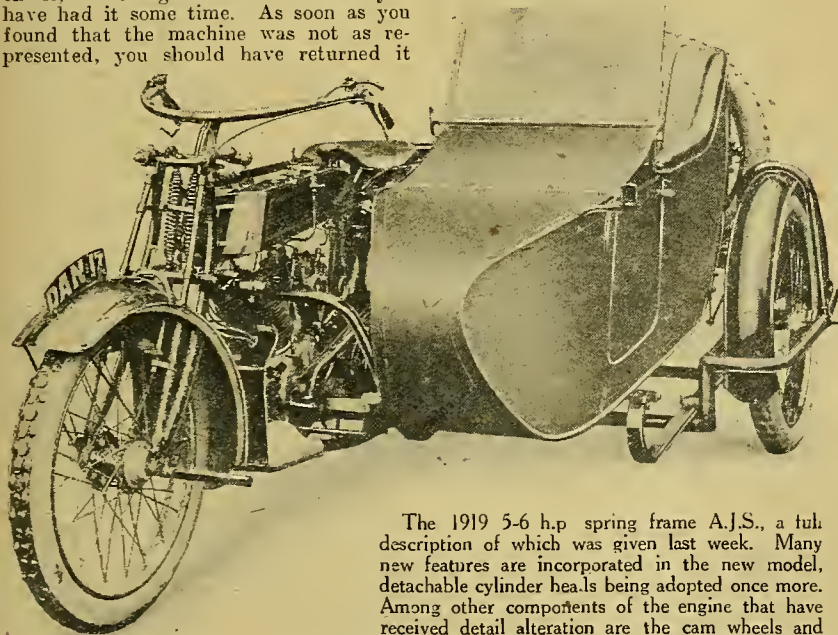
A Legal Query.

Wishing to purchase a motor cycle, I answered the following advertisement: "Motor cycle. 2 h.p., B. and B., U.H. magneto, as new." Eventually I bought it. It will rev. on the stand, sometimes, but, although I have spent a lot of money on it, it will not go. How do I stand with regard to a prosecution for "misrepresentation"? One of the pedals fell off the other day.—C.G.

You do not say how long it is since you purchased the machine, but you do state that you have spent a lot of money on it, which goes to show that you have had it some time. As soon as you found that the machine was not as represented, you should have returned it

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C.4, and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

to the seller and demanded your money back. Your proper remedy is to commence an action for damages for misrepresentation, and you should put this in the hands of a solicitor, so that he could advise you as to whether you have sufficient evidence. With regard to the question of fraudulent misrepresentation, your letter does not sufficiently indicate that the seller was guilty of criminal fraud, but, if you wished, you could discuss this with your chief constable. However, from the point of view of your own pocket, it would be best to drop the question of any criminal prosecution and proceed for damages on your solicitor's advice, that is, if the party you purchased the motor cycle from is worth suing.



The 1919 5-6 h.p. spring frame A.J.S., a full description of which was given last week. Many new features are incorporated in the new model, detachable cylinder heads being adopted once more. Among other components of the engine that have received detail alteration are the cam wheels and their shafts, exhaust valve lifter mechanism, exhaust pipe angle, and the valve springs.

Overflowing Petrol.

The petrol drips out of the air ports of my carburettor spray chamber.

At the bottom of the latter there is a cone-shaped arrangement, with holes in, through which the petrol drips the very second I stop. Whether it is like this going along, I cannot say for certain, but I think it is, because of the petrol consumed.—R.I.P.

The petrol level is evidently too high. The float may have petrol inside it, which will have to be removed by putting the float in boiling water until the spirit is evaporated. The hole must then be closed with solder. If the float is all right the needle should be ground in and the level lowered by tapping the needle collar slightly toward the top of the needle.

Operation of a Hub Gear.

I have a Humber motor bicycle fitted with a two-speed hub. Would you tell me how I get the second speed, as there are three pedals? That on the right is the band brake, and the one on the left is the pedal which gives the free engine position. Is the inside one on the left the second speed, or only another band brake?—T.W.C.

The low speed pedal is the one without any catch; that is to say, the low speed is only in engagement while your foot is on the pedal; it operates the gear through a band. The top speed pedal has a catch which engages the top gear, keeping it permanently in until released. The other pedal, of course, is the ordinary rear brake.

Fitting a Variable Gear.

I have a 3½ h.p. 1912 Humber motor cycle and sidecar, fitted with a Roc two-speed hub gear. I find, however, that the second gear is not low enough to take the outfit, when loaded, up some of the hills I encounter, whereas I feel confident, if I had a lower gear to fall back upon, it would climb them well enough. Now, if I fitted a variable pulley, such as the Philipson, and, when I was on the second gear, started to use the variable pulley, would this be equivalent to a third or still lower gear? I am told by a friend that this would make no difference, as I should be still running on the second gear.—A.J.S.

Certainly, the fitting of a variable pulley would help matters greatly. Your friend is clearly in error. The fitting of a Philipson pulley would mean that you would get a variation in the gear ratio on both top and bottom speeds.

Liability for Repairs.

?

I bought a motor cycle from a friend, and went up to his place to try it with him, and it would not go. He suggested that we should take it to a garage, which we did. The bicycle is now ready, and the garage people want £2. Now who should pay the £2—the person from whom I bought the machine, or myself? There was nothing said at the time, but it was understood I bought the machine in running order.—J.C.M.

The question of liability depends on the ownership of the machine at the time it was repaired. If the sale had been completed, you would be responsible unless the machine was sold you as being in running order. As there was apparently an "understanding" to this effect (which would have to be proved), we think your friend should settle the matter, or, if he refuses, at least he should pay half.

Charging Accumulators.

?

In our town the electricity supply is alternating, fifty periods one hundred volts, and from this current I have adapted a device to charge the accumulator of my motor cycle consisting of two cells of two and a half volts each, with a total capacity of about sixteen ampère hours. The current being alternating, I am obliged to transform it to a direct current. This is done with the "Electrolytic Clapet," composed of a phosphate of soda bath, in which are immersed an aluminium plate and a lead plate, the first being joined to the positive of the accumulator, the second being joined to a lamp acting as resistance. (1.) Is a lamp of fifty watts suitable, or must I use twenty-five or one hundred watts? (2.) Is this device sound to charge accumulators? Is not the high voltage of the alternating current (100 volts) prejudicial to a good charge of a small accumulator? Or does the lamp used as resistance reduce the voltage sufficiently to ensure a good charge?—R.C. (Havre).

The Electrolytic rectifier you mention, known in this country as the "Noden Valve," is quite sound, and forms the best means of charging small accumulators from alternating current mains without the need of buying more expensive apparatus. (1.) A few precautions only are required to ensure successful working. The connections you give are correct. For an accumulator of sixteen ampère hours capacity either a fifty watt or one hundred watt lamp may be used as the resistance. If there is plenty of time for charging use the smaller lamp, as the lower rate will be better for the accumulator. The voltage of this lamp is important. The Noden valve itself will absorb about twenty volts, so that the lamp must be suitable for about eighty volts. If a lamp for one hundred volts is used hardly any current will pass. (2.) The valve is liable to become rather hot in working, and this must be watched. The solution should not come up higher than 2in. from the top of the containing jar. The aluminium should be pure, and the water should be distilled. The voltage is reduced to a suitable figure by the lamp mentioned above, and no harm will be done to the accumulator.

Taking a Motor Cycle to Australia.

?

Would you please tell me the cost of duty on a second-hand motor cycle brought into New South Wales (Australia), the owner travelling by the same boat? Its value is about £35. Also the cost of freight from England to Australia?—R.H.W.D.

The duty on a motor cycle taken into Australia is £10 per machine, while the rate of freight to Melbourne, Sydney, or Adelaide, is 20s. plus ten per cent. per ton.

Timing.

?

(1.) Would you be so good as to let me know the timing of a 4 h.p. single-cylinder J.A.P. engine? (2.) I have just overhauled my engine and cleaned it, and now find that there is no compression. Will this return when the engine has been running for a bit?—F.W.R.

(1.) Time the engine in the following manner: *Valves:* Set the exhaust valve to close just after the completion of the exhaust stroke. It will then commence to open when the piston is about one-seventh of the length of the stroke from the bottom of the firing stroke. The inlet should commence to open as the exhaust closes, and remain open for one complete stroke of the piston, or while

IMPORTANT NOTICE.**GOODS MADE IN GERMANY.**

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the flywheels turn through 180°. *Magneto:* Remove the compression tap. Rotate the engine slowly until the piston is within three-eighths of an inch of the top of the compression stroke. (This point can be found by inserting a pencil or piece of wire through the compression tap opening.) This is the position the piston should be in when the igniting spark passes, which in turn takes place when the contact breaker points on the magneto just separate; it remains, therefore, to arrange that both these operations synchronise. Loosen the magneto sprocket, which is usually on a taper spindle. Rotate the magneto armature in its proper direction until the contact points just separate; take note that the piston is still in its proper position. Now fix the sprocket tightly, taking care not to move the armature in doing so, and again verify the position. In the case of magnetos which give a variable point for ignition, the lever should be set in the "Fully advanced" position prior to timing, i.e., as far as it will go in an opposite direction to the armature rotation. (2.) There should certainly be some compression after overhauling. If there is any at all, it is likely to improve after the engine has been run a little, but it

looks very much as if the valves were not seating properly, and the most likely cause of the trouble is that you have ground in the valves, which has had the effect of bringing the valve stems down lower, so that, unless the tappets are adjusted to make up for the difference, they do not seat properly.

READER'S REPLY.**A Mysterious Trouble.**

With reference to "H.F.K.'s" trouble, I have a 4 h.p. three-speed combination, which I recently dismantled for cleaning. When cleaned and reassembled the engine started first kick, so I thought there was not much wrong with it. I went for a trial trip with a passenger in the sidecar, and had gone about two miles when the engine started to knock. I retarded the spark and manipulated the air lever with no effect. The machine came to a standstill, apparently overheated. I looked round, but could not find anything wrong, and when it had cooled down it started off well again, only to repeat the trouble. When I got home I examined the engine to see if the timing was correct, and finding this was so examined the valves to see if they were sticking. These being quite all right, I took off the cylinder, but could not see anything wrong with the piston or rings. I then worked the valves up and down, and they seemed quite all right, but as they were covered with excess of oil I thought I would take them out and clean them. I got some paraffin, added a little petrol, and was cleaning with a brush when the exhaust valve guide dropped right off, hence the trouble. When the valve was in place the tension of the spring held the broken guide up against the cylinder, therefore it was impossible to detect the breakage.—A CONSTANT READER.

EXPERIENCES WANTED.

"A.H.J." (Chester)—Binks carburetter on a 5-6 h.p. Indian for solo and sidecar.

RECOMMENDED ROUTES.**SCARBOROUGH TO GLASGOW.—L.L.S.**

Scarborough, Whitby, Guisborough, Middlesbrough, Stockton, Darlington, Gainford, Barnard Castle, Middleton-in-Teesdale, Alston, Brampton, Longtown, Gretna Green, Ecclefechan, Lockerbie, Beattock, Abington, Lesmahagow, Hamilton, Glasgow. Approximately 216 miles.

FELIXSTOWE TO MANCHESTER.—J.W.G.

Felixstowe, Ipswich, Stowmarket, Woolpit, Ixworth, Thetford, Stoke Ferry, King's Lynn, Terrington, Long Sutton, Holbeach, Swineshead, Sleaford, Leadenham, Newark, Mansfield, Chesterfield, Baslow, Chapel-en-le-Frith, Cheadle, Stockport, Manchester.

SALISBURY TO MANCHESTER.—J.H.

Salisbury, Wilton, Stapleford, Heytesbury, Warminster, Beckington, Bath, Nailsworth, Stroud, Gloucester, Tewkesbury, Worcester, Kidderminster, Bridgnorth, Wellington, Hodnet, Whitchurch, Tarporley, Northwich, Altrincham, Manchester.

The Words of Godfrey's

THE AGENTS OF LON,

Concerning Deposits

(Another Chapter not to be found in the book of Artemas.)

NOW of all the laws of the land of En, none was more profitable to those agents whose ways were devious than the law of the essence of contract.

For it could be so wangled that the agent got the essence and the buyer the burden of the contract.

And the manner of the wangle was this: they would entice the public with smooth words, saying, "Lo, we can deliver to thee the machine thy soul desireth." And for some would they fix a date, and for others promise early deliveries.

And they did take deposits with orders.

Now, seeing the men who rode on wheels were sports and knew not the law, they did pay gladly, without stipulation.

Then, peradventure, the time would come that one of the men who had wasted his substance, or was tired of waiting for that which was always promised but never arrived, would seek to cancel his order.

Now, the righteous agent would straightway return the deposit—saying, "Friend, here is thy money which thou entrusteth to my care."

But, if otherwise, the agent would verily wangle the deposit to his own profit.

Take heed, and hearken unto the voice of Godfrey's, for it is in the reputation of a house that lyeth thy safety.

IN placing orders with GODFREY'S (or, in fact, with any Agent of repute), the Customer need have no fear concerning Deposits. GODFREY'S invariable rule is to return them in full should delivery not be required. But in view of the very illuminating answer to a "Legal Query—Essence of Contract," in a recent issue of "The Motor Cycle," it behoves the customer to select his agent with some discrimination.

Write for Godfrey's Full List of New Machines for which they can accept orders.

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Best Prices paid for Modern Second-hand Machines. Send full particulars and our representative will call at your convenience.

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BELOW we give a selection from to-day's stock, which we think you will rightly say is the best in London. We think also that the prices will compare favourably with those asked elsewhere. The reason why we can offer a varied stock in the midst of the present shortage is *not* that we cannot sell, but that we **KNOW HOW AND WHERE TO BUY**. In ordering, a second or even a third choice should be given, as it is impossible in these days to keep any list up to date. Remember also the three salient terms of our dealing:

1. A three days' free trial, your money back in full at the end if not satisfied.
2. A three weeks' option of exchange. Your machine taken back at the full price paid within three weeks of purchase, for anything else from stock, or any new machine.
3. A three months' guarantee, the same guarantee that the makers give.

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A.J.S., 1916, 2½ h.p., 3-speed	55 gns
A.J.S. 1916 4-5 h.p. 3-speed Combination, spare wheel	110 gns.
ALLON, 1916, 2-speed, excellent order	39 gns.
ALLON, new 1919, 2½ h.p., 2-speed, clutch	£55 0
BAT-J.A.P. 1915 5-6 h.p. 3-speed countershaft Combination	78 gns.
B.S.A. 1913 3½ h.p. 2-speed clutch Combination	47 gns.
BROUGH, 1916, 3½ h.p., 2-speed	59 gns.
BRADBURY, 1915, 3½ h.p., flat twin, 3-speed	55 gns.
CHATER-LEA, 1915, 4 h.p., 3-speed, coach Sidecar	56 gns.
CALTHORPE-J.A.P., 1915, 2½ h.p., 2-speed, clutch	31 gns.
CALTHORPE-J.A.P., 1916, 2½ h.p., 2-speed, clutch	38 gns.
CALTHORPE-J.A.P., 1916, 4-5 h.p., twin, 2-speed, clutch	55 gns.
DOUGLAS, 1917 4 h.p. 3-speed Combination	85 gns.
DOUGLAS, 1915, 4 h.p., solo	59 gns.
DOUGLAS, 1914, 2½ h.p., 2-speed	39 gns.
ENFIELD, 1915, 3 h.p., 2-speed, clutch	39 gns.
F.N. 1914 7-9 h.p. 3-speed Combination	75 gns.
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HUMBER 1918 6-8 h.p. water-cooled Combination; 30 gn. Sidecar, as new	110 gns.
HUMBER 1917 6-8 h.p. water-cooled Combination	85 gns.
INDIAN, 1916, 5-6 h.p., 3-speed, disc wheels, as new	72 gns.
INDIAN 1915 5 h.p. 3-speed Combination	78 gns.
INDIAN, 7-9 h.p., 2-speed, spring-frame, perfect	55 gns.
JAMES, 3½ h.p., twin, 3-speed, 1916	59 gns.
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NEW IMPERIAL, 1916, 2½ h.p., 2-speed, good order	32 gns.
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RUDGE, 1913, T.T.	26 gns.
TRIUMPH, 1914, 4 h.p., 3-speed	48 gns.
TRIUMPH, 1914, 4 h.p., 3-speed	50 gns.
TRIUMPH, 1914, 4 h.p., 3-speed, coach Sidecar	59 gns.
WILLIAMSON, 1915, 8-10 h.p., water-cooled, 2-seater Sidecar	85 gns.
ZENITH-GRADUA, 1915, 4-5 h.p., T.T.	59 gns.
ZENITH-GRADUA 1913 6 h.p. Combination	48 gns.
ROYAL RUBY, new 1919, 2-stroke	£40 0

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Single-speed, 2-stroke	£46 0
2-speed, 2-stroke	£62 0

Disc wheels, £2 ros. extra; long plated exhaust pipe, ros. extra.

Catalogue on request.

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MOTOR CYCLES FOR SALE.

Chater-Lea-Jap.

CHATER-J.A.P. 8hp. Combination, 3-speed; £43.—The Lodge, Sunnyfield, West Heath, Hampstead. [5161]
21h.p. Chater-Lea-Jap. Bosch mag., Druid forks, R.B. carburettor, semi T.T. bars, black tank; £12/10.—88, Park Rd., Dulwich, S.E.21. [4969]

CHATER-LEA 1914 Combination, 8hp. J.A.P. engine, 3-speed, clutch, all-chain drive, coachbuilt sidecar, storm apron, lamps, speedometer, handle starter, etc.; £70, no offers.—G. Snuman, Northfields, Dewsbury. [X4457]

CHATER-LEA Combination, 8hp. J.A.P. engine, 3-speed gear box, chain drive, large sidecar, carrier basket, speedometer, lamp, horn, mirror, perfect condition; £95.—Bull, 71, Southchurch Rd., Southend-on-Sea. [X4924]

Clyno.

1913 Clyno, less back cylinder; £45, or nearest.—Chimie, Electricity Works, Falkirk. [5152]

CROW Bros., High St., Guildford, West Surrey agents for the 1919 Clyno Order now to ensure early delivery [1552]

CLYNO, 6-8hp., 1913, very good condition, new chains, 2 speeds, Lucas lamps and horn; £42.—T., 24, Towaley Rd., E. Dulwich. [4937]

CLYNOS—Parker and Son, St. Ives, Hunts., sole agents for Huntingdonshire, are now booking orders for early deliveries. Phone: 15. [4870]

Defaux.

DEFAUX Motor Cycles, complete, Bosch mag., Whittle belt, new tyres and tubes, wants slight attention; £5, no offers.—2, Watkin Rd., Folkestone Kent. [X4989]

Dot

DOT-J.A.P. 1915 8hp. Combination, new tyres, coachbuilt sidecar, wind screen, lamps, etc., excellent condition, any trial; bargain; £75.—Fletcher, 1, Barrowell Green Villas, Green Lanes, Palmer's Green. [5045]

Douglas.

I DREAMT I rode an horizontal twin,

AND Next Day I went to Gourlays,

AND Now I am more than delighted.

GOURLAY, The Great Douglas Agent, Fallowfield [5223]
 1913 Douglas, 2 speeds, etc.; £30.—Drews' Garage, Urminger, Essex. [4942]

DOUGLAS, late 1912, 2½h.p., 2 speeds, as new; £30.—8, Lancaster Rd., Lertonstone. [4936]

1915 2½h.p. Douglas, 2-speed, in good condition; £46.—Harrow Inn, Cleam, Surrey. [4930]

DOUGLAS, 1915 Colonial Model, 3-speed; £46.—13, St. James's Rd., Kingston, Surrey. [4972]

DOUGLAS, 2½h.p., single speed, re-enamelled, nearly new tyres; £36.—23, Hevellyn St., Keswick. [X4873]

DOUGLAS, 1914, perfect, new tyres; 40 gns.; after 6 p.m.—Wembleyden, Wembley Park Drive. [X4842]

1919 Douglas in stock; exchanges quoted.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [5014]

1914 Douglas, 2½h.p., 2-speed, fine condition; £42; after 6.—105, Oxford Gardens, Notting Hill. [5123]

1913 2-speed Douglas, T.T., long exhaust; 34 gns.; call after 5.—18, Hestercombe Av., Fulham, S.W.6. [5002]

1913 Douglas, perfect, thoroughly overhauled, 2-speed; £38/10.—Palmer, 127, Montgomery St., Hove. [X5098]

DOUGLAS in Stock, 4hp. combination, £95; War Office 2½h.p. model, £60, new.—Moffat, Yeovil. Phone: 50. [1103]

GIBB, The Douglas Expert, Gloucester, is the man to get in touch with for best deliveries and advice. Phone: 852. [4749]

10—Douglas, 1910, new rear tyre, Bosch mag., spring forks, wants key-pin for flywheel.—Gough, Highfield, Northwich. [X5063]

1914 Douglas, 2½h.p., 2-speed, lamps and hooter, in first-class condition; £38.—S. Gold, 17, Hackney Rd., Shoreditch, E.2. [4878]

DOUGLAS, 1915, 2-speed, W.D. model, nearly new.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [5006]

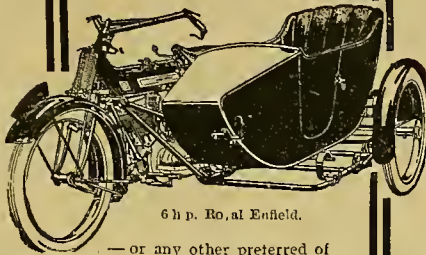
1915 4hp. Douglas and Coachbuilt Sidecar, 2 speeds, lamps, tools, etc., perfect condition; £70.—H. Wright, Arlesey, Beds. [5090]

DOUGLAS, 1913, 2½h.p., 2-speed, in splendid running order and condition; £28.—Beal, Pumping Station, Parkhouse Camp, Salisbury. [5127]

DOUGLAS 4hp. Combination, 2 speeds, Montgomery sidecar, late 1915, good condition, including tyres; £65.—Knight, 42 Foster St. Lincoln. [X4881]

DOUGLAS, 1914, 4hp., kick start, like new, recently overhauled, Bosch, speedometer, good tyres; 45 gns.—92, Peel Rd., Wembley. [5263]

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Douglas.

DOUGLAS, 1913, condition as new, tyres, 2-speed, etc., wants new crankshaft; £30, no offers.—Advertiser, 136, St. Ann's Rd., Tottenham. [X4960]

DOUGLAS, 1913, 2½h.p., 2 speeds, all accessories, excellent condition; £35.—Leggett, 73, Little Cadogan Place, Sloane Sq., London, S.W.1. [4880]

DOUGLAS, 1915, 2½h.p., 2 speeds, footboards, new Dunlop tyres, fully equipped, perfect condition, unused 2 years; £40.—Broad, High St., Esher. [5070]

1919 Douglas Motor Cycles, delivery from stock 2½h.p. 2-speed, £60; 4hp. 3-speed combination, £105.—Tom Norton, Ltd., Llandriddod Wells. [X4621]

DOUGLAS, 2½h.p., 1914 model, lamp, horn, etc., in good condition, only done 2,000 miles.—Apply, T. Lyal, Behar, West Heath Rd., Hampstead, N.W.3. [5265]

DOUGLAS, 2½h.p., delivered June, 1917, 3-speed, clutch, kick starter, 2 lamps, horn, very little used, guaranteed perfect; £62.—G. C. Carter, Sloughbridge Rectory, Glos. [X4351]

DOUGLAS, 2½h.p., excellent condition, not used for 3 years, Bosch, lamps, generators, horn, tyres good; after 7 o'clock; £22/10.—East View, Stanhope Rd., Highbate. [5048]

DOUGLAS, 1913, engine just been overhauled, sound and running well, footboards, lamps, generator, horn, tyres had very little wear; £35.—Brown, Lord St., Sleaford. [X5120]

DOUGLAS, Feb., 1917, engine No. 32,742, 3-speed, clutch, Lucas horn, used 4 months only, perfect condition; best offer over £55; Manchester district.—Box 2,997, c/o The Motor Cycle. [X5074]

1915 Douglas, 2-speed, stored since 1917, brand new condition, electric lighting, mechanical horn, luxurious mount, ready to ride away; £47/10.—Casey, 18, Archway Rd., Highbate, N.19. [5191]

1914 Douglas, 2½h.p., 2-speed countershaft, kick starter, foot clutch, electric lighting set, mechanical horn, and accessories, perfect running order; £45; after 6 p.m. only.—7, Ravenhurst Av., Hendon. [X5044]

ELI CLARK can give you good advice also good deliveries of 1919 Douglas motors. He will help you if possible with spares. The man on the spot.—196, Cheltenham Rd., Bristol. Phone: 4169. Wires: Ignition, Bristol. (Please do not send sample spares.) [0966]

DOUGLAS, 1913, 2-speed, clutch, kick starter, footboards, mud-shields, Lucas set, Stewart speedometer, A.K. knee-grips, extra tool case, full set of tools and spares, new tyre on back, the whole in perfect order; £35.—Abbott, Pembroke College, Cambridge. [X4916]

DOUGLAS, 4hp. and 2½h.p., brand new models, in stock. We are stockists and specialists of Douglas machines only, giving the finest service and the greatest choice of models in the South. Over nine years' experience as Douglas agents.—Thompson and Co., 408, Commercial Rd., Portsmouth. Phone: 7105. [2518]

2½h.p. Douglasses, brand new, fitted 3-speed gears, 24 touring or semi-T.T. bars, footboards 15/6 extra. £60; two best lamp sets, horn, registration, writing number plates. £5/10 extra. Enquiries invited, full specification by post.—Robinson's Garage, Green St., Cambridge. [5246]

4hp. Douglasses, brand new, fitted 3-speed gears, clutch, kick-start, with Douglas coachbuilt sidecar, £95; 3 lamp sets, horn, registration, writing number plates. £5/10 extra. Enquiries invited; full specification by post.—Douglas Specialists, Robinson's Garage, Green St., Cambridge. Tel.: 388. T.A.: Bicycles. [5245]

Elswick.

1915 Elswick-Torpedo, 2½h.p., 2-stroke, 2-speed, lamp set, condition perfect; £30; after 6.—354, Uxbridge Rd., Shepherd's Bush. [5121]

Enfield.

TALBOT, Ware.—3hp. twin Enfield, 1914, in perfect condition; 40 gns. [X4998]

ENFIELD, 1914, 3hp. twin, 2-speed; £35.—Lient, Mounds, Red Barracks, Woolwich. [5149]

ENFIELD, all models, early deliveries.—J. A. Staves, Sole Agent, 12, Ecclesall Rd., Sheffield. [X1543]

ENFIELD—Earliest deliveries. Your name on our list ensures this.—Martin Mitchell, Ltd., Stafford. [X4614]

1916 Enfield Combination, new condition throughout; any trial; £100.—H. Wright, Arlesey, Beds. [5089]

ENFIELD Combination, 6hp., 1916, good condition; no dealers; £92.—195, Stanstead Rd., Forest Hill, S.E. [5195]

1916 3hp. Twin Enfield, 2-speed, kick start, lamps, accessories, as new; £45.—Reeve, Wyboston, N.1. [5232]

ENFIELD Combinations and 2-strokes. Early deliveries.—Sole Agent, Longman, Bisherton St., Salisbury. [4854]

1919 Enfields, 3hp. 66 gns., 6hp. combinations 120 gns.; actually in stock.—Tom Norton, Ltd., Llandriddod Wells. [X5117]

ENFIELD Combination, 6hp., 1916, perfect in every way; any trial; £85.—Seymour, 6, Ringstead Rd., Catford, S.E. [5231]

MOTOR CYCLES FOR SALE.

Enfield.

6 h.p. Enfield Combination, 1915 model, in excellent condition; £97/10.—Wauchope's, 9, Shoe Lane, Fleet St., London. [5241]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries Enfields, all models. [2261]

1914 6 h.p. Enfield Combination, coachbuilt sidecar, redecorated, splendid condition; £60.—Edwards, 10, Devonshire Rd., Bexhill. [X4735]

ENFIELD, 1914, condition as new, lamps, etc., not been used for 3 years; £80, no offers.—Motorist, 136, St. Ann's Rd., Tottenham. [X4960a]

ENFIELD 3 h.p. Twin, Model 140, 2 speeds, etc., slightly soiled; 50 gns.—The Exeter Motor Cycle and Light Car Co., Ltd., Bath Rd., Exeter. [0958]

ENFIELD, 1914, 2½ h.p. twin, 2-speed, new tyres and horn, perfect running order; £30, or nearest reasonable offer.—Adcock, 15, Longwall St., Oxford. [X5043]

2½ h.p. Enfield, 2-speed, kick start, overhauled, re-fitted, enamelled, new chains, new Dunlop tyres and tubes, first-class condition; £35, bargain.—Cameron, Kenig Hill, Glam. [X4850]

ENFIELD 6 h.p. Combination, 1914, hood, screen, speedometer, 3 lamps, little used during the war, in perfect condition; £65.—Beswick, 1, West Heath Av., Golder's Green. [5030]

1916 6 h.p. Enfield Combination, in perfect condition, with Klaxon horn, lamps, Stewart speedometer; £105; seen by appointment Saturday afternoon or Sunday morning.—Neill, 85, New River Crescent, Palmer's Green, N.15. [4959]

6 h.p. Enfield Combination, delivered 1917, fitted with hood, screen, Lucas lamp with most expensive generator, speedometer, mudshield, and Binks carburettor, tyres unpunctured, guaranteed perfect in every way; price £180.—Hood, 45, Bow Common Lane, Bow, E. [5188]

Excelsior.

EXCELSIOR, 1913, 3½ h.p., hand clutch, B. and B., Bosch, nice appearance; £35.—Jarrett, 130, Bunnhill Row, E.C. [4441]

F.N.

F.N. Lightweight, 2½ h.p. (accumulator), engine in good order, one pedal crank broken; £9.—19, Hertford St., Mayfair, W. [X5024]

Grandex.

1914 5-6 h.p. Grandex-Precision Twin, hardly used, C.B. sidecar, hood, etc., 2 speeds, etc., speedometer, practically as new, very fine lot, lighting, etc.; bargain, £75.—Drews' Garage, Upminster, Essex. [4947]

Harley-Davidson.

HARLEY-DAVIDSON 1915 Combination: 100 gns., lowest.—Broom, 77, Marylebone Lane, W.1. [4986]

4 h.p. Harley-Davidson, 1915, coachbuilt sidecar, perfect order, spares; £50.—Porter, Maithy's Motor Works, Sandgate, Kent. [4974]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new Harley-Davidsons. [2262]

HARLEY-DAVIDSON 7-9 h.p. Combination, 1916, very little used, in perfect order, lamps, horn, etc.; £130.—Norris Farm, E. Coves. [5136]

HARLEY-DAVIDSON Combination, electric model, splendid condition; £95, or near offer.—Harrison, 23, Crockerton Rd., S.W.17. [5273]

HARLEY-DAVIDSON, 1917, 7-9 h.p., mag. model, and H.D. sidecar, in exceptional condition, £120; also 1915 electric model, £67/10.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [5011]

Hazlewood.

1915 6 h.p. Hazlewood-Jap Combination, 3-speed, lamps, horn, speedometer, hood, screen, been stored since Oct., 1916; £65.—Barlow, 153, Park Rd., Wigan. [X4885]

Henderson.

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new Hendersons. [2264]

HENDERSON.—Orders now being booked for earliest deliveries.—Sole agents for South Hants: The Fareham Motor Cycle and Engineering Works, 2, High St., Fareham. [5198]

1915 4-cyl. Henderson Motor Cycle, Millford tandem sidecar, Stewart speedometer, head lamps, tail lamp, and side lamp, all in good condition.—Can be seen at any time at Brock's, The Square, Birchington, Kent. £85. [4871]

Hobart.

1916 Hobart, 2½ h.p., 2-stroke, 2-speed, Villiers, done 500 miles, as new; £32.—Lt. Barlow, 22nd (L.) Tank Battalion, Bovington Camp, Wool, Dorset. [4881]

HOBART-VILLIERS, 2-stroke, countershaft 2-speed, E.L.O. Amac, electric lighting, back saddle rest, accessories, as new; £37, or exchange.—63, Solon Rd., Brixton. [5027]

Humber.

HUMBER, 3½ h.p., 2-speed, and sidecar; £35.—Johnson, 61, Osborne Rd., Acton. [5156]

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MOTOR CYCLES FOR SALE.

Humber.

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries in w 3½ h.p. and 6 h.p. flat twin Humber. [2265]

HUMBER, 1917, 3½ h.p. flat twin, enamelled green, mileage under 2,000, good condition; accept £65, or near offer.—R. S. Culpin, Narcissus Gardens, Spalding. [X4736]

3½ h.p. Humber Combination, 1915, Starmey-Archer 3-speed, clutch, kick start, 3 lamps and generators, Millford coachbuilt sidecar and apron; the whole in new condition; £60; would exchange with cash for 5-6 h.p. combination.—34, Settrington Rd., Fulham, S.W. [5005]

Indian.

INDIAN, 7-9 h.p., 1914, 2 speeds, clutch, spring frame, excellent condition; £42.—34, Grove Av., Norwich. [X5041]

7-9 h.p. Road Racer Indian, done 3,000 miles, excellent condition; £50.—Ainsworth, 41, Sharpley Park, Bolton. [X5048]

INDIAN, 1915, 7 h.p., spring frame, 3-speed, sidecar, all O.K.; £75; seen London, S.E.—Box 2,992, c/o The Motor Cycle. [X5022]

INDIAN, 7-9 h.p., late 1915, clutch model, mileage 500, new condition; inspection invited; £60.—Bell, Enfield Wash. [4519]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new Indians. [2263]

INDIAN, late 1915, 7-9 h.p., T.T. clutch model (red), grand condition throughout; first cheque £52 secures.—Box 2,995, c/o The Motor Cycle. [X5079]

1915 3½ h.p. Indian, 3-speed, clutch, kick-start, fully equipped as good as new; nearest £50; deposit.—Williams, Llwynawws, Barmouth. [X5981]

INDIAN, 1916, 5-6 h.p., 3-speed, hand and foot clutch, kick starter; £62; after 7; no dealers.—Matthews, 30, Delvino Rd., Parsons Green. [4890]

INDIAN, 5-6 h.p., 1916, 3-speed, clutch, kick start, electric light, heavy Dunlops, perfect condition; best offer over £58.—93, Northwold Rd., Clapton. [5150]

INDIAN 1915 Combination, 7-9 h.p., 3 speeds, electric lamps and horn, disc wheels, fast, magnificent turnout; £85; wanted, Morgan.—24, Beauval Rd., East Dulwich. [4991]

5 h.p. Twin-cyl. 1915 Indian, fitted with 3-speed countershaft gear, kick starter, and clutch; £77/10.—Wauchope's, 9, Shoe Lane, Fleet St., London. [5242]

1912 Indian, 7-9 h.p., 2-speed, new back wheel, Dunlop heavies, low gear slips, needs adjustment only, running order; 23 gns., first cheque.—Wiles, Newchurch, Kent. [5064]

LATE 1915 Indian Combination, 7-9 h.p., spring frame, electrical equipment, new tyres, stored 2 years; £75; seen any time.—Pike, 102a, Church St., Chelsea. 'Phone: 137 Kensington. [5147]

INDIAN Combination, 7-9 h.p., most luxuriously fitted, all electric lights, electric horn, and everything to perfection, enamel and plating not scratched, like new; £80.—Hood, 45, Bow Common Lane, Bow. [5188]

Invicta.

INVICTA-VILLIERS, 2-stroke, 1915, perfect; £25.—Frost, 12, Ethelred Rd., Coventry. [X4979]

Ivy.

1915 2½ h.p. 2-stroke Ivy, stored 2 years; £25, offers.—Box 2,991, c/o The Motor Cycle. [X4967]

1914 4½ h.p. Ivy-Precision, 3-speed, clutch, fully equipped, little used; £45.—Stanley, St. Andrew's Rd., Cambridge. [4888]

IVY Motor Cycles.—For immediate delivery of these famous 2-stroke machines, try The Walsall Garage, Wolverhampton St., Walsall. 'Phone: 444. London Depot: H. G. Henly and Co., 91, Gt. Portland St., W.1. 'Phone: 4084 Mayfair. [4672]

James.

JAMES.—Immediate delivery of all models.—Sole district agents, The Walsall Garage, Wolverhampton St., Walsall. 'Phone: 444. [4671]

VERY Late 1913 James, 4½ h.p., 3-speed, clutch, lamps, horn, spares, etc., condition perfect, been stored 18 months; genuine bargain, £36/10 lowest.—6, Cannon Place, Brighton. [5181]

1915 4½ h.p. James Combination, as new, no scratches, mileage 2,223, speedometer, all accessories, pillion seat, been stored; any trial; cost £120, nearest £85 secures.—Apply, Box 2,996, c/o The Motor Cycle. [X5093]

JAMES 5-6 h.p. Combination, 3-speed, kick starter, 28x3 Palmers, 3 lamps, horn, tools, and accessories, bought new December 1918, mileage 900; tea days makers' guarantee still to run; price £110; trial.—Ibbotson, Beddington Place, Croydon. Tel.: 740 Croydon. [X4994]

RIDER TROWARD and Co., 31, High St., Hampstead.—James machines. Delivery this month new 5-6 h.p. twin combination. £126; 4½ h.p. solo, 85 gns.; combination, 104 gns.; delivery February, 3½ h.p. twin, 85 gns.; March, 2½ h.p. 2-stroke. Orders accepted in strict rotation. [2267]

MOTOR CYCLES FOR SALE.

Royal Ruby.

ROYAL Ruby, 2-stroke; order now for earliest delivery of 1919 models.—Longman, Fisherton St. Salisbury. [2359]

ROYAL Ruby.—Best deliveries 2½ h.p. and 3 h.p. models. Order now.—Tom Davies, 229, Deansgate, Manchester. [4427]

ROYAL Ruby.—Orders now being booked for earliest delivery: 2-strokes £40, 3 h.p. combination £135.—Rider Troward and Co., 31, High St., Hampstead. [2902]

Rudge.

1916 3½ h.p. Rudge Multi, in splendid condition; £45.—Hewes' Garage, Upminster, Essex. [4945]

1915 Rudge Multi, 3½ h.p., Service finish; £40.—Redland House, Carshalton Rd., Sutton, Surrey. [X4985]

1916 Rudge Multi, 3½ h.p., Palmer cord tyres as new, ready to ride away; 40 gns.—251, Rye Lane, Peckham. [4913]

RUDGE, 3½ h.p., Grado pulley, and sidecar, good condition, complete; £28.—Mawdsley, 21, Lord St., Heywood, Lancs. [4602]

RUDGE, clutch model, 3½ h.p., handle start, and coachbuilt sidecar; £30.—9, The Parade, Cambridge Rd., Norbiton, Surrey. [4920]

RUDGE Multi, 1914, hand clutch, 5-6 h.p., good condition, minus starting pedals; £45.—Couchman, 45, Claremont Rd., Tunbridge Wells. [X5090]

RIDER TROWARD and Co., 31, High St., Hampstead.—Rudge Multi, 1.0 M. models only. Orders being booked for earliest delivery. [2272]

1914 5-6 h.p. Rudge Multi Combination, speedometer, lamps, horn, lot good condition; £55.—50, Upton Rd., Donham Rd., Dalton, N.I. [5040]

RUDGE Multi, 1914, 3½ h.p., new tyre and belt, in excellent condition; £35, a bargain.—Lt. Hackforth, R.A.F., Isle of Grain, Kent. [X4730]

RUDGE Multi, 1914, competition machine, prize winner, good condition, ride away; £34.—Forfield, 13, Forfield Place, Leamington Spa. [X5021]

RUDGE, 3½ h.p., free engine clutch, semi T.T. bars, new tyres and belt, new Binks carburettor, disc wheels; £38, offers.—J. Waters, Sura, Healdon Lane, Church End. [4911]

RUDGE MULTI, 3½ h.p., 1913-14, and sidecar, new covers, just refurbished and overhauled, hot air intake, P. and H. largest set; £35.—Sparks, 45, Park Lane, Stoke Newington. [X4987]

RUDGE, 3½ h.p., 1914, single gear, Lucas lamps and horn, speedometer, tyres, and belt, in perfect condition, not ridden 10,000 miles; £40.—Box L9, 634, c/o The Motor Cycle. [5256]

RUDGE Multi Lightweight Combination, 3½ h.p., specially designed sidecar, very well sprung, speedometer, lamps, accessories, excellent condition, usual trial.—O.C. Signals, Manor House, Staines. [X5095]

I.O.M. Rudge Multi, 3½ h.p., 1918 machine with 1915 engine, overlap cam and spore, just thoroughly overhauled, T. and H. lamp, new leather belt, 2 spare belts complete, exhaust valve, etc., new back tyre, front like new; bought car; £65.—Lt. Twentyman, Pickering, Yorks. [4896]

LATE 1914 Rudge Multi 5-6 h.p. Coachbuilt Combination, complete lamp sets, speedometer, horn, new belts, tools, etc., all new condition, been stored 3 years, guaranteed only done 4,000 miles, genuine perfect combination; £60, distinctly no offers.—6, Cannon Place, Brighton. [5213]

RUDGE Multi 7-9 h.p. Twin Engine Combination, ridden few months only, engine No. 13,496, luxuriously fitted up with speedometer, hood, screen, Lucas horn, large lamp set, acetylene and electric lamps, rear and sidecar, full Rudge kit and many extras, appearance and tyres nearly as new, ready to drive away; £110, absolute lowest.—Chapman, 26, Whimpey St., Plymouth. [X4734]

Scott.

NEW Looking Scott Combination, 1913-14, costly coach car, engine just thoroughly overhauled, new Binks carburettor.—30, Lee Park, Blackheath. [4963]

1914 Scott Combination, hood wind screen, luggage grid, in good condition; £50; exchange with cash for Ebbell or other twin combination.—Johnson, 139, Hill Top, Bolsover, Derbyshire. [X4885]

Seal.

LATE Model Seal 2-seater Combination, wheel steering, hood, screen, electric lights, J.A.P. engine, Binks, A.J.S. type gear, start from seat, all accessories, Euk easy starter, 700×80 light car tyres, comfortable turn-out, excellent condition; price £100.—1a, Richardson Rd., Eccles, Manchester. [X5091]

Singer

SINGER 2½ h.p. Lightweight, in splendid order; £19/10.—Hall, Auctioneer, Whetstone, N.20. [4955]

SINGER Motor Cycle, 2 h.p., good condition; £19, or near offer.—14, Montem Rd., Forest Hill, S.E. [5035]

SINGER, 1913, 3½ h.p., excellent condition, free engine, clutch, Bosch, unused 3 years; £32.—Manger, Blundell and Co., 3, Birkbeck Rd., Ridley Rd., Dalston, E.8. [4985]

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Combination £126 0

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countershaft £100 0

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6 h.p. dynamo models .. 140 gns.

8 h.p. 122 gns.

8 h.p. dynamo models .. 142 gns.

Two 1919 propositions worth your

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Detachable wheels. Spare Wheel,

£5 extra.

A.B.C., 3 h.p., twin engine, gear box and

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We are appointed Agents for both these

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A.B.C. expected in April or May.

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Sun.

1914 Sun-Villiers, 2-stroke, excellent condition; £25, appointment.—205, South Croxted Rd., Dulwich. [4882]

SUN-VILLIERS, 1916, 2½ h.p., single geared, excellent order throughout; £24.—D.F.H., 7, East Rd., Maidenhead. [5208]

1913 Sun Motor Cycle, 4 h.p., J.A.P. engine, 3-speed Sturmey-Archer gear, Bosch mag., new belt and tyre, with best coachbuilt sidecar; £60.—Reynolds, The Green, Newport Pagnell. [5186]

Sunbeam.

1919 Sunbeams in stock; exchanges quoted.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [5016]

SUNBEAM Combination, 3 speeds, 3½ h.p., lamps, horn, speedometer, excellent condition; £85.—Applv, 49, Hornsey Lane. [4876]

SUNBEAM, 3½ h.p., 1914 T.T. model, in first-class condition, lamps, speedometer, Klaxon horn, tools, etc.; £70.—Wilhoit, Ashbourne, Derby. [4981]

1914 Sunbeam Coachbuilt Combination, 3½ h.p., lamps, speedometer; 60 gns., will separate.—Matco, 38, Waterloo Rd., Hammersmith, London. [5271]

1915 Sunbeam 6 h.p. and Sidecar, J.A.P. engine, in extra good condition, £125; wanted, solo or 2-seater car, cash adjustment.—B. Gaydon, Upper Norwood, S.E.19. [5154]

SUNBEAM, 2½ h.p., 2-speed, kick start, hand clutch, Smith's speedometer, Lucas horn, lamps, tools, several extras, only covered about 500 miles, absolutely unscratched, and indistinguishable from new, guaranteed perfect; £72/10.—Abergele Motor Co., Abergele, N.W. [X4407]

Swift.

1915 Swift, 3½ h.p., variable gear, B.B., Simms magneto, accessories; offers.—Clement, 123, Palewell Park, Mortlake. [5213]

Triumph.

1919 Triumphs in stock; £87.—Parker and Son, St. Ives, Hunts. [4156]

1919 Triumphs in stock.—Parker and Son, St. Ives, Hunts. 'Phone: 15. [4567]

1919 Triumph, 4 h.p., 3-speed, countershaft, in stock.—Bacon, Wellington, Salop. [X4574]

TRIUMPH, countershaft, 1919; early deliveries; £87.—Longman, Fisherton St., Salisbury. [2360]

NEW Triumph; immediate delivery; £87.—Wanchope's, 9, Shoe Lane, Fleet St., London. [5234]

1914 4 h.p. Triumph, 3 speeds, lamps, horn, etc.; £40, no offers.—H. Wright, Arlesey, Beds. [5091]

TRIUMPH, 1910, 3½ h.p., Mabon clutch, just overhauled; £20.—21, Stoolley Rd., Tottenham. [5175]

1919 Triumphs; cash or exchange.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [5022]

1914 4 h.p. Triumph, 3-speed, in perfect condition; £50.—Miller, 49, Sandhill Rd., Erit, Kent. [5072]

TRIUMPH Spares in Stock.—W. Brandish, Triumph Garage, 625, Foleshill Rd., Coventry. 'Phone: 1050. [X3369]

TRIUMPH, 3½ h.p., 3-speed, free engine, C.B. sidecar, perfect condition; first £50.—56, Stewart St., Nuneaton. [X4825]

1919 Countershaft 4 h.p. Triumph in stock.—Agcut, J. A. Stacey, 12, Ecclesall Rd., Sheffield. [0939]

1914 Triumph, T.T., fixed engine, splendid condition; £32, no offers.—Lieut., 53, Pellam St., S. Kensington. [4910]

TRIUMPH, 1914, 3 speeds, also coachbuilt sidecar for same; approval, cash.—416, Windmill, Shiregreen, Sheffield. [X5027]

TRIUMPH, 1912, renovated 1914 by makers, stored 4½ years; £25; after 6.—21, Marlborough Crescent, Chiswick. [X4855]

TRIUMPH, 1914, 4 h.p., Sturmey 3-speed, Watsonian coach sidecar, lamps; £58.—29, St. Leonard's St., Bromley-by-Bow. [5112]

1914 Triumph, 3-speed, clutch, 4 h.p., T.T. roadster, fully equipped, as new; £56.—Parsons, 116, St. Leonard's Rd., Windsor. [X5092]

TRIUMPH, T.T. 1914, 4 h.p., 3 speeds, clutch, tyres nearly new, smart machine; £48.—17, Convent Gardens, South Ealing. [X5096]

1913 Triumph, T.T., 3½ h.p., D.R.'s handle-bars, Lucas lighting set, tools, ride away; £35; after 5.—68, Kerry Rd., New Cross. [4970]

3½ h.p. Triumph, F.E., good condition, little used; exchange higher power or combination, with cash.—Pratt, Tailor, Huntingdon. [5033]

MOTOR CYCLES FOR SALE.

Triumph.

TRICMPH. 3½ h.p., 1913, new engine, pedal start, replated and enamelled: £32.-9, The Parade, Cambridge Rd., Norbiton, Surrey. [4919]

TRICMPH Baby Model, 1915, 2-stroke, 2-speed, splendid order: £47/10.—Elee and Co., 15-16, Bishopsgate Av., Cannonide St., E.C. [0491]

TRICMPH, 3½ h.p., 1914, N.S.V. 2-speed, lamps, tools, splendid condition, ready ride away: £35.—Lt. Hunter, The Green, Marlborough, Wilts. [4873]

TRICMPH 3½ h.p. Engine with Frame, tank, handlebars, etc., Bosch mag., B. and B. carburetter; first £12/10 secures.—Abergele Motor Co., Abergele. [X4410]

3½ h.p. Triumph, 1913, free engine, just overhauled, 2 new Dunlop; seen Saturday or Sunday: £30.—excellent machine.—52c, Hickford Rd., Brixton, S.W.9. [4961]

1910 3½ h.p. Triumph, Bosch mag., B. and B. carburetter, adjustable pulley, tyres splendid condition: £16.—Hart, 27, Walpole Rd., New Cross, S.E. [4930]

RIDER TROWARD and Co., 31, High St., Hampstead.—Triumph, delivery February, 4 h.p., £87. Orders being looked for 2-stroke, earliest delivery. [2273]

1913 Triumph, 3½ h.p., free engine, £10 just paid for overhaul of engine by makers: £30; 1919 4 h.p., 3-speed, in stock, £87.—Hick, Sherburn, York. [4891]

TRICMPH, 3½ h.p., free engine model, late 1913, lamps, horn, tools, tyres as new, perfect throughout, and as good as new, not used during war: £45.—Abergele Motor Co., Abergele. [X4409]

3½ h.p. T.T. Triumph, special machine, renovated and Philipson pulley fitted by Triumph 1918. Very fast and in excellent condition: 50 gns.; no dealers.—Jerrard, School House, Sutton Coldfield. [X5053]

1913 Triumph, 3½ h.p., T.T. foot clutch, kick starter, paraffin vaporiser, auxiliary petrol tank, lamps, and all accessories, sound running order: £42; after 6 p.m. only.—7, Ravenhurst Av., Hendon. [X5045]

TRICMPH, 3½ h.p., 1913, fixed engine, as new, perfect condition, not ridden during war, all accessories, Miller head and rear lamps: £30.—Apply by appointment, 63, Douglas Rd., Goodmayes, Essex. [X4726]

TRICMPH Combination, 1913 (June), 3½ h.p., 3-speed, clutch model, Middleton sidecar, tyres all but nearly new, speedometer, Lucas lamp, spares, only used on leave, etc., since 1915, just overhauled, good condition; seen City: £45.—Barnes, Henley, Fernhurst, Sussex. [X4878]

Vindeo.

VINDEO, 3½ h.p., 2-speed gear, Bosch, spring forks, B. and B., perfect.—87, New Park Rd., Brixton. [5270]

Wolf.

WOLF, 1914, 2½ h.p., 4-stroke, in splendid condition; for sale, £32.-73, Oakhurst Grove, East Dulwich, S.E.22. [4964]

4 h.p. Wolf-Jap, countershaft 2-speed, all-chain, underslung coachbuilt combination, like new, fully equipped: £48.—Robson, Thames Ditton. [5144]

Zenith

ZENITH, 3½ h.p., 1913, light sidecar, grand condition: £40.—50, St. George's Rd., Forest Gate. [5086]

1914 T.T. 8 h.p. Zenith-Gradua, disc wheels, long exhaust £50; after 5.—Sutton, 21, Conlyle Av., Harlesden, N.W.10. [5132]

1914 90-horse Zenith, Phoenix cigar sidecar, lamps, belts, etc., tyres excellent; offers.—11, Elgin Mews North, Maida Vale. [5038]

ZENITH Combination, coachbuilt sidecar, Gradua, 7 h.p., good order: £38.—Cyclist, next door to Green Man, Whetstone, N.20. [4953]

RIDER TROWARD and Co., 31, High St., Hampstead.—Zenith-Gradua, new models, delivery this month; prices on application. [2274]

ZENITH, 1916, 6 h.p., T.T. countershaft, horn, tools, knee grips, tyres, enamel like new: £65; exchange Indian and cash.—Southolme, Byfleet, Surrey. [5184]

6 h.p. Zenith, all-black finish, enamel, etc., as new, good running order, bought 1914, very little used, with lamp, etc.: £55.—Brown, 24, Peckham Rye. [4971]

ZENITH-GRADUA, 3½ h.p. J.A.P., Bosch, Amac, lamp, horn, new Dunlop and belt: £25, offers, quick sale.—Box 2,975, c/o The Motor Cycle. [X4853]

ZENITH-GRADUA, 1917, 8 h.p. twin, in perfect condition throughout, only done about 200 miles; offers wanted.—80, Granga Drive, Winchmore Hill, N.21. [5068]

ZENITH-GRADUA, 1914, 8 h.p., luxurious sidecar, nearly new tyres, screen, lamps, grand condition, owned 3 years: £76/10.—156, Browning Rd., Manor Park, E.12. [5093]

ZENITH and underslung sidecar, machine No. 3523, 1915, 6 h.p., countershaft, kick start, lamps, speedometer, splendid running order: £80.—Seen any time at 175, Camberwell Grove, London, S.E.5. [5209]

ZENITH 8 h.p. Countershaft Combination, in excellent condition, kick starter, etc., Canelet coachbuilt sidecar; accept £78 cash; seen any time except Sundays.—24, Grosvenor Av., East Sheen, S.W.14. [5153]

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Zenith.

1915 Zenith, 8 h.p., with Millford coachbuilt sidecar, in perfect condition, tyres new, also spare tube and belt, new P. and H. lamps and Klaxon; £80, or nearest.—2, Church Hill, Walthamstow. [X4988]

Miscellaneous.

THE H.C. Motor Co., 347, Finchley Rd., N.W.3, have the following machines for disposal:

JUNO, 1918, 3½ h.p. J.A.P., Sturmey-Archer countershaft gear, new machine: 69 gns.

ENFIELD, 1915, 3 h.p. twin, Enfield gear, perfect order: 37 gns.

PREMIER, 1913, 2½ h.p., 3-speed, clutch, pedal start, just overhauled: 27 gns.

ZENITH Combination, 1914, 6 h.p. J.A.P., sporting coach sidecar, perfect: 69 gns.

INDIAN, 1915, 7-9 h.p., 2-speed, kick, clutch, just thoroughly overhauled: 49 gns.

T.A.C., 10 h.p., 4-cyl., 3-speed, spring back and front, just completely overhauled, with sidecar chassis: 49 gns.

T.D.C., 3½ h.p., Grado gear, Bosch, good order: 19 gns.

UTO-WHEEL, 1915, fitted to Triumph, 1916, best 3-speed gear gent's cycle, perfect order: 19 gns.

SINGER, 1914, 3 h.p., open frame, 2-speed, kick, clutch: 34 gns.

ARIEL, 4 h.p., new machine, just down from makers: £80.

HUMBER, 2½ h.p., 1914, twin, single speed, good order: 24 gns.

TORPEDO, 1914, 2½ h.p., 2-speed, Precision engine: 22 gns.

A.L.P., 1½ h.p., 1913, perfect order, Bosch mag.: 18 gns.

MARTIN-J.A.P., 3½ h.p. o.b.v., one of Harry Martin's racers, very fast, and perfect throughout: 35 gns.

THE H.C. Motor Co., 347, Finchley Rd., N.W.3, Phone: Hampstead 4631. Open Saturday afternoons and Sundays. [5258]

JONES' Garage.—1919 Victory Model Matchless, spare wheel all wheels detachable and interchangeable: £140.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1919 New Imperial combinations, 3-speed and hand-controlled clutch: £126.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1919 model K B.S.A., £79/16; 1919 model H B.S.A., £81/15.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1919 3½ h.p. Ariel, 3-speed and clutch: £80.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1919 New Imperial lightweight: 48 gns.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1919 Ariel Combination, 5-6 h.p., actually in stock.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1919 5-6 h.p. Rover, in stock: £100.—Broadway, Muswell Hill, N.10.

JONES' Garage.—Lists on application.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1916 Sun-Villiers, 2-stroke, 2-speed, electric lamps, horn, etc., quite as new: £35.—Broadway Muswell Hill, N.10.

JONES' Garage.—1917 Alldays Allon, 2-speed, handle-bars, control clutch, all lamps, horn, as new, unscratched: £42/10.—Broadway, Muswell Hill, N.10.

JONES' Garage.—3½ h.p. 1916 Abingdon, King Dick, T.T. model, as new, all lamps, a fast mount: £45.—Broadway, Muswell Hill, N.10.

JONES' Garage.—Norton Combination, lamps, horn, nice machine, fast: £85.—Broadway, Muswell Hill, N.10.

JONES' Garage will have all other makes as soon as the makers start supplying.—Broadway, Muswell Hill, N.10.

JONES' Garage, short bus ride from either Finsbury Park or Highgate Tube Railway.

JONES' Garage.—1916 semi-T.T. 3 h.p. Enfield, as new: £55.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1914 Zenith-Gradua, 3½ h.p.: £45.—Broadway, Muswell Hill, N.10.

JONES' Garage.—1917 New Imperial-Jap, 2-speed, like new, all lamps, horn, etc.: £45.—Broadway, Muswell Hill, N.10.

JONES' Garage, short bus ride from Finsbury Park or Highgate Tube Station.

JONES' Garage will be pleased to give you fuller particulars of any machine or machines upon request.

JONES' Garage.—1914 4 h.p. Triumph and Coachbuilt Sidecar, 3-speed, new Dunlop tyres, new cylinder and piston, perfect: £65.—Broadway, Muswell Hill, N.10.

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The Horse-power of Motor Cycles.

NOT once or twice only, but many times we have pointed out the necessity for some combined action and universal agreement on the matter of the horse-power rating of motor cycles. At the present time, although a certain amount of agreement exists with reference to one or two popular sizes, every manufacturer is a law unto himself, and consequently nominal horse-power bears no constant relation to engine capacity. It has become customary to designate an engine of 500 c.c., or thereabouts, $3\frac{1}{2}$ h.p., but one engine of 488 c.c. is commonly called 4 h.p.; another (a four-cylinder of 496 c.c.) is rated as 5 h.p. A certain twin engine of 430 c.c. has been used by several makers, some of whom call it 3 h.p., others $3\frac{1}{4}$ h.p. Engines up to 550 c.c. are frequently known as $3\frac{1}{2}$ h.p., but some years ago a 3 h.p. engine had a capacity of only 353 c.c. Many more instances could be given, but the foregoing will suffice to show how much confusion at present exists in the rating of nominal horse-power, and consequently in the minds of novices. For instance, we have been asked whether, in the event of a certain $3\frac{1}{2}$ h.p. engine (554 c.c.) proving to be insufficiently powerful for sidecar work in a given district, a 5 h.p. (496 c.c.) would be more suitable. This clearly shows the need for some recognised formula upon which makers shall base the nominal horse-power rating.

A Suggested Rating.

Now, for several years, we have insisted that a motor cycle in good tune should be capable of producing 1 h.p. for every 100 c.c. of its capacity, and we have suggested that makers should rate the horse-power of their motor cycles upon this basis, which has the great advantages of simplicity and accuracy. As time goes on and engines improve it may be desirable to reckon 1 h.p. per 80 or 90 c.c., but at the moment we think 100 c.c. will meet the case. Of course, we do not mean to imply that the

suggested rating gives a true estimate of the utmost power of which an engine is capable, and we do not think it desirable that the latter should be given as a figure denoting nominal horse-power, even if it can be maintained for a considerable time. It is quite possible for a 500 c.c. to show something like 11 h.p. on a brake test, but it is only very rarely that such a power output would be demanded of it on the road.

Some Existing Formulæ.

There are, of course, many horse-power formulæ in existence. Of these the R.A.C. and Poppe are simple, but quite absurdly inaccurate when applied to motor cycles. The inadequacy of the former, which is also known as the Treasury rating, was very clearly demonstrated in our columns at the time when it was proposed to tax motor cycles on a horse-power basis. With regard to the latter it is only necessary to point out that it gives the horse-power of the usual 500 c.c. single as 4.67 and that of a 425 c.c. twin, which is most obviously of less power, as 5.62. The formula generally known as the Dendy-Marshall, but which more than one engineer claims to have originated, is excellent for showing the utmost capacity of an engine, when used in that form which takes revolutions per minute into account. The Rüde and the Hospitalier, the latter being another formula taking account of "revs.," both give good results when the average running power is wanted, while the Lanchester and S.M.M.T. formulæ may be ruled out as being unnecessarily complicated.

In support of our often repeated suggestion we would urge its extreme simplicity, which is desirable in any case, but especially so if taxation by horse-power should again come to the fore. It should be remembered, too, that the A.C.U. for competition purposes—wisely we think—divides motor cycles into classes on their capacity alone, entirely ignoring the nominal horse-power given by the manufacturers.

Occasional Comments

by "Ixion"

Police Traps.

EVERYBODY admits that crime is on the increase, especially amongst juveniles, who have been relieved of salutary discipline by daddy's absence on active service. Yet this is the time selected by the police authorities to pester the small handful of motorists with a type of surveillance which was always silly and apt to be ridiculous in its incidence. One might as well instruct a fire brigade to patrol the streets watching where smokers threw their matches, and leaving an empty fire station to receive brigade calls. The average motorist frankly despises the legal speed limit, which is a piece of camouflage invented by dishonest politicians to smooth down ignorant prejudices. It was never intended to be enforced, and cannot be enforced. It leaves the public just where they always were—at the mercy of the commonsense of individual drivers, who generally know that 10 m.p.h. is quite as often legal but dangerous, as 30 m.p.h. is illegal but safe. This tongue-in-the-cheek legislation is now foolishly exploited by certain police areas to the neglect of far more urgent duties, and for the profit of local funds. It is high time that this obsolete regulation was replaced on the statute book by a "dangerous driving" regulation. In the meantime, authorities who exploit it show that they misinterpret their responsibilities.

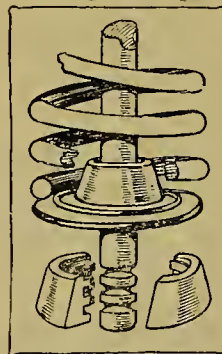
Clean Run.

THERE was nothing spikier in creation than the 1914 type of aeroplane. Bits of wire and levers and kingposts and instrument fittings and turn-buckles and piping and exhaust pipes and other oddments bristled out of its every surface and corner and angle quite incredibly. Time went on, and wind tunnel research proved that efficiency demanded smooth surfaces and streamlined projections. It must have seemed a pretty hopeless task to smooth out the irregularities of a machine which resembled a game at spillikins more than anything else on earth; but it was done, as a glance at one of our latest fighters will reveal; they are like a winged swordsheath. Now motor cycles are also inconceivably bristly. They have no mechanical modesty, but blazon forth to the world their every part; in fact, I can never understand how their innate effrontery permits them to conceal their pistons. The handle-bar is a mass of clips and nuts and levers; the engine is covered with all manner of protruding details, and the latest countershaft gear boxes look like an engineer's scrap heap, silver-plated. None of these things matter where locomotive efficiency is concerned; our speeds hardly call for streamlining and varnished exteriors. But these chinks and crannies and corners are an intolerable nuisance to the type of owner who likes a clean machine. The cleaning of the average motor cycle after the briefest run in bad weather demands illimitable patience, illimitable paraffin, and a glorified outfit

of scrapers and brushes resembling a leviathan's manicure set. I dreamed last night of a motor cycle equipped with a streamlined gear box and crank case, forming a single unit, and topped by a polished aluminium cylinder block, as smooth as a flapper's cheek; whether it concealed water-cooling or formed the cowl of an air-cooled four-cylinder, my dream did not reveal. Motor cycles are not as bristly as they used to be; I once owned one which had five 6in. levers on the top tube (two carburetter, one ignition, one compression tap, one silencer cut-out), and if one leapt too far forrard in essaying a jump mount, the results were painful to a degree. We have left that sort of thing behind, but we are uncommonly slow in realising that quite 50% of our riders dislike wasting time, and yet prefer a clean mount.

Valve Spring Fastenings.

A CORRESPONDENT enquires whether our engines are likely to follow aero practice and drop the slotted stem and cotter method of securing the caps of valve springs. Most aero valves



Valve spring collar retaining device as used on aeroplane engines.

are fitted with a coned spring cap, which is pushed up against a pair of split cones by the spring: internal shoulders on the cones engage annular grooves in the head of the valve stem. This system avoids weakening of the valve stem by a slot and is easily refitted on overhead valves of generous size. Our valves do not break at the slot, and are usually somewhat inaccessible, especially when a spring-holding tool is in position. The ordinary slot and cotter is probably the best for side

m.o.v. especially in conjunction with such a neat little spring-holding gadget as the Triumph Co. supply.

Technical Policy.

I DARESAY readers have recognised that the genesis of a sound cycle car may have the most far-reaching effects in the whole motor cycling industry. In past years the British policy concentrated on the double-purpose machine. With the exception of a few lightweights most British machines were adaptable either to sidecar or solo work, and were, indeed, frankly constructed with that end in view. Now the group of firms associated with the A.B.C. Co. announce a fundamentally different policy. Conceiving that it is possible to produce a sound cycle car, they eliminate the heavy sidecar *de luxe*, and down come the c.c. and weight of their bicycle with a bang. Naturally so, since it is designed for a small and constant load. The question arises whether motor bicycles of 3½ h.p. to 8 h.p. would presently dis-

Occasional Comments.—

appear from other firms' catalogues if the cycle car should prove itself at a low price? The answer is probably in the affirmative, but there are a few caveats. For a sturdy youngster there is no solo sensation which quite comes up to road-eating on a real heavy, high-powered "hogbus" of 8 h.p. Again, some riders dislike "revs," and the small engine cannot offer high speed on a high gear. Finally, the cycle car is not merely a substitute for the sidecar outfit, but would deprive most of its owners of all solo riding—the man who formerly owned a bicycle and a sidecar could not always run to a bicycle and a cycle car. In case the cycle car makes good, a change of policy by motor cycle manufacturers seems probable, especially as cheap four-wheeled cycle cars would have far wider sales than any three-wheelers.

A Folding Prop.

A FEW months back a medico discoursed very interestingly in our columns about his ideal motor cycle. It struck me that on the whole he was trying to compress the Yankee ideals of complete equipment into the dimensions of a baby two-stroke, and that he would be lucky if his steed scaled much under 3 $\frac{1}{4}$ cwt. But I relished much his suggestion of a folding prop on the near side of the 'bus. Whenever we stop with a standard machine three alternatives confront us, and each is unpleasant. If there is a wall handy, we try to balance the jigger against it, which often necessitates buck-jumping 3 cwt. up a 6in. kerb. As we depart the machine begins to slide away, scrapes the levers off one end of the handle-bar, and then stabs its tank heavily with the inside grip. If the stop occurs in the country we discover a hump by the edge of the road

and balance the jigger against it. We turn away to light a pipe, and the footrest eats through to the base of the soft mud hump. The machine side-loops noisily into a ditch full of manure and nettles. Educated by such experiences we finally learn to use our stands.

The Unpuncturable Tyre.

MY note of February 27th on the Rapson tyre has provoked a letter from the inventor, who desires me to say that his tyre is a "pukka" pneumatic, from which I augur that it must be adapted for our use, no less than for the lordly motor car. I made a mistake in apostrophising him as the Napoleon of the motor industry, for the reference provided him with the excuse that Josephine was calling, just when his disclosures were getting really interesting. Anyhow, readers will be glad to know that the firms behind the production of the invention are a guarantee of its practicability, and Mr. Rapson may rest assured that, when he offers the world a tyre which cannot puncture, motor cyclists will necessarily be even more interested than car owners. Dear me. What times we live in. Zeppelins that rather enjoy being perforated by ten drums of "tracer." Pocket telephone receivers, on which you're to be rung up by wireless from Hong Kong whilst climbing Beggar's Roost. Dreadnoughts which can't be torpedoed. Tyres which don't puncture. If any big inventor is hunting round for some unsatisfied public need, let me say I am prepared to pay through the nose for a bottomless purse.

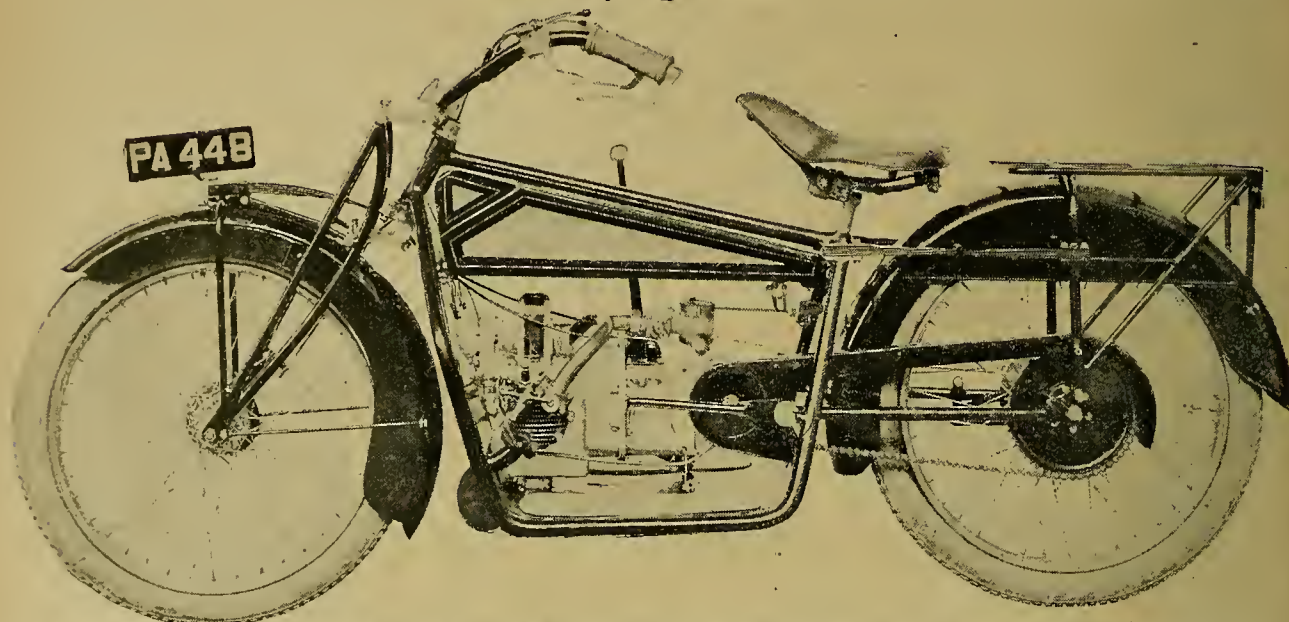
(Top) Passing through the village of Downes. (Bottom) Members at the Three Horse Shoes, Knockholt. Douglas, Matchless, Harley-Davidson, and Triumph outfits, also a Morgan, were among the makes represented.



THE
OPENING
RUN OF
THE
WOOL-
WICH,
PLUM-
STEAD
AND
DISTRICT
MOTOR
CYCLE
CLUB.

THE 3 h.p. A.B.C.

Flat Twin Engine, 68.6 mm. \times 54 mm., 398.4 c.c.; Four-speed Gear Box, Gate Change, and Spring Frame.



The new spring frame 3 h.p. A.B.C., the engine of which is a flat twin fitted transversely in the frame. Many of the features are revolutionary in design, yet the ensemble is decidedly attractive.

SOME preliminary details regarding the A.B.C. post-war programme appeared in *The Motor Cycle* of November 28th, 1918, page 475. Since that date items in the 1919 programme have undergone some modification, and the engine and other parts have been considerably improved.

The first impression one receives of the new A.B.C. is that it is designed as a motor bicycle. It is no slavish copy of any existing design, but a bold attempt to construct a self-propelled two-wheeler on original lines, but with no suspicion of freakishness. The designer's ingenuity has had full play, and yet, with all its originality, there appears to be no reason why the machine should not be successful in every way.

Probably the first characteristic of the machine which strikes one is the lack of void spaces between wheels and frame and about the engine. It is a motor cycle designed around an engine gear unit rather than an over-developed bicycle fitted with an engine, and the result is most pleasing to the eye. It requires attention at one point, however, to make it conform to the ideals of a large coterie of all-weather riders. We refer to the mudguarding and the chain cover. We think the rear guard would be improved by the extension of the valance between the chain and the tyre, and that a totally enclosed chain would be better than the threequarter guard shown on the model illustrated.

When the early successful A.B.C. motor bicycles are recalled, and the immense experience in the construction of aero engines that the firm has had during the past four and a half years is taken into consideration, it is not surprising that the

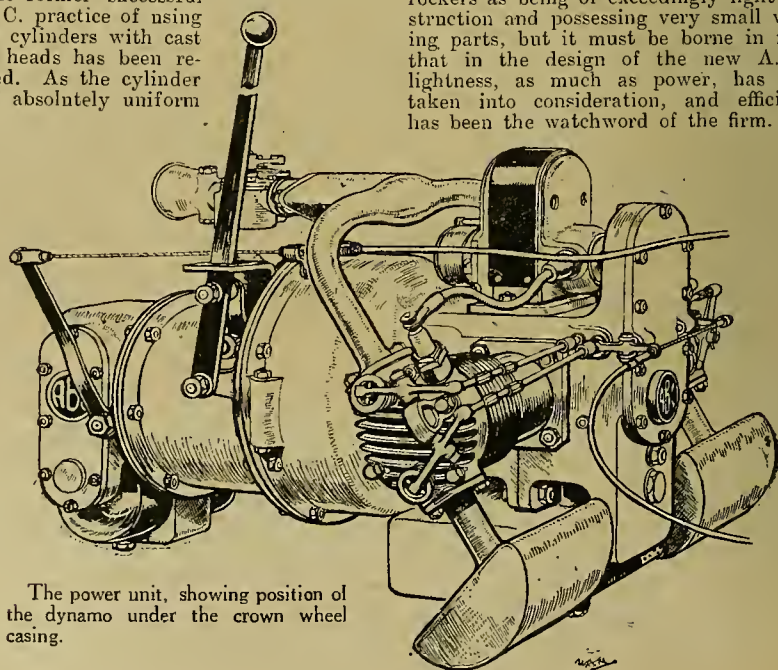
new A.B.C. clearly shows how much the firm and its designer, Mr. Granville Bradshaw, have learnt during this period.

Mechanically-minded readers naturally turn first of all to the engine, or, rather, the power unit, for in the new A.B.C. the engine and gear box are in one. As previously announced, the cylinders are placed athwart the frame, but this does not render the machine unreasonably wide.

The former successful A.B.C. practice of using steel cylinders with cast iron heads has been retained. As the cylinder is of absolutely uniform

design, there are no unnecessary pieces of metal to cause hot spots and distortion. The hemispherical cylinder heads are held on to the steel cylinders by six bolts. The valves are of the overhead type, made of unbreakable steel, with volute springs in place of the more usual helical type.

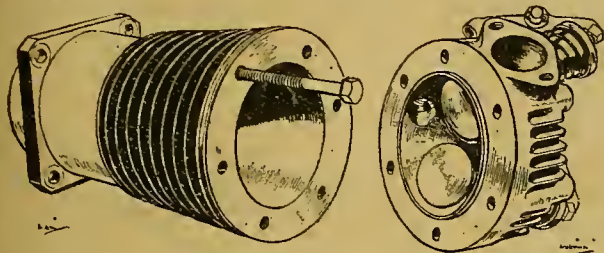
At first sight, there is a tendency to regard such items as tappet rods and rockers as being of exceedingly light construction and possessing very small wearing parts, but it must be borne in mind that in the design of the new A.B.C. lightness, as much as power, has been taken into consideration, and efficiency has been the watchword of the firm. All



The power unit, showing position of the dynamo under the crown wheel casing.

The 3 h.p. A.B.C.—

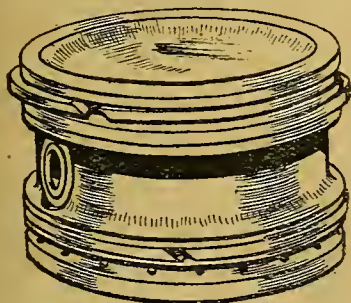
moving parts, such as tappets, bearings, and rocker bearings, are bushed with phosphor bronze, and the rockers themselves work on a broad arrow-shaped bracket screwed on to the cylinder head. Needless to say, the tappet rods are adjustable.



The A.B.C. cylinder and detachable head. One long holding-down bolt is shown.

The small ends of the connecting rods are bushed to take the gudgeon pin, which also floats in the piston, and the big ends are provided with roller bearings kept in position by a split collar which is recessed to engage with the crank cheek, which prevents it from rotating on the crank pin. While these split collars are not a new feature in A.B.C. design, the method of holding them in position is quite novel. Ball-bearings are employed for the two-throw crankshaft. Die-cast aluminium pistons are adopted, having two rings at the top and a scraper ring, while the base of the piston is of slightly smaller diameter than the remainder, and is drilled with a series of holes, which relieves all oil pressure and prevents oil from being forced into the combustion heads.

At the bottom of the vertically divided crank case is a pressed steel oil sump, holding sufficient lubricant for 1,500 miles. Below this sump is situated a gear-type oil pump which is always immersed in oil. This pump forces lubricant through an



Aluminium piston with concave head.

oil-way in the crank case directly on to the connecting rod big ends, and the other working parts are lubricated by oil-mist. In the oil feed system, on the right-hand side of the crank case, there is a Rotherham oil indicator, by means of which the rider can ascertain that the oil is circulating properly.

The timing wheels are five in number, the topmost driving the magneto; next comes the driving pinion; then the camshaft pinion, which runs on ball bearings; next an intermediate wheel for reducing the speed of the oil pump, which revolves at one-sixth of engine speed;

and, finally, the oil pump wheel itself. The arrangement of the timing gear is an exceptionally pretty piece of design, and the neat little camshaft is a perfect car job in miniature.

The magneto is a special type C.A.V., and is situated on the top of the crank chamber in a most accessible position.

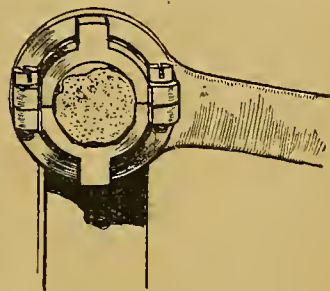
Its position, and the design of the engine, permit of extremely short high-tension wires being used; in fact, Mr. Bradshaw told us that he had considered the advisability of doing away with the insulated high-tension wire altogether, and having a single copper wire leading from the high-tension terminals to the plugs.

Clutch and Gear Box.

Forming part of the crank case casting is the flywheel housing, the flywheel embodying the clutch. This is of the self-contained inverted cone type and Ferodo lined. The clutch spring is of ample strength, so that no adjustment should be necessary, while sufficient leverage is provided on the control to render the clutch withdrawal an extremely easy matter. This is effected by means of a twist grip on the handle-bar. The clutch is operated by a long rod passing right through the hollow five-splined mainshaft of the gear box, and actuated at the rear end by a lever on the clutch control shaft. When the clutch member is out it is entirely free, and runs on the gearshaft only. The splined shaft runs

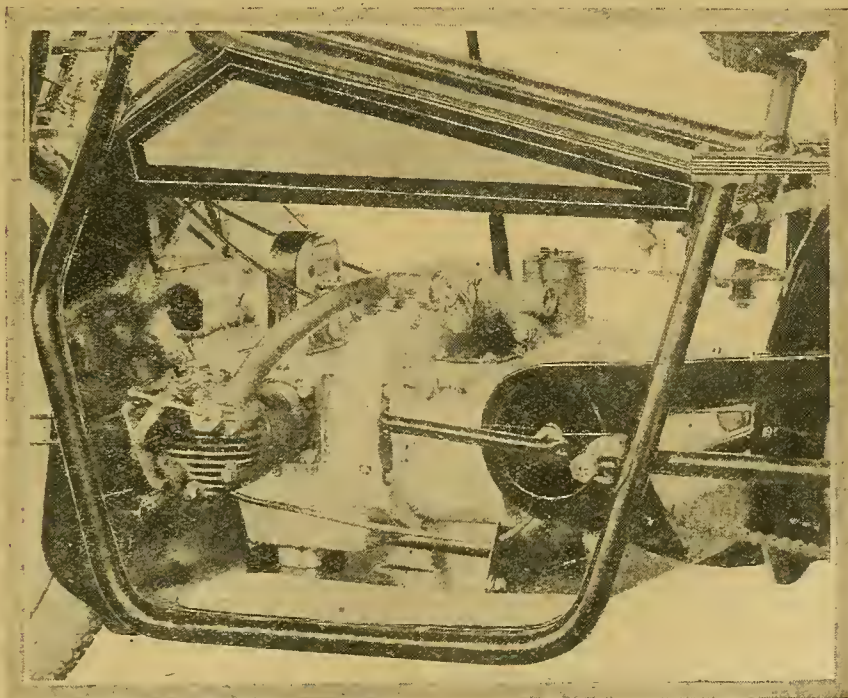
on roller bearings at its forward end, while the secondary-shaft is internally splined and also runs on roller bearings, and carries the clutch.

The gear box provides four speeds, and the gear wheels, it may be mentioned, are ten pitch, and are the same size as those employed on light cars. It is also interesting to note that the layshaft runs on ball bearings, while the final



Split collar on crank pin.

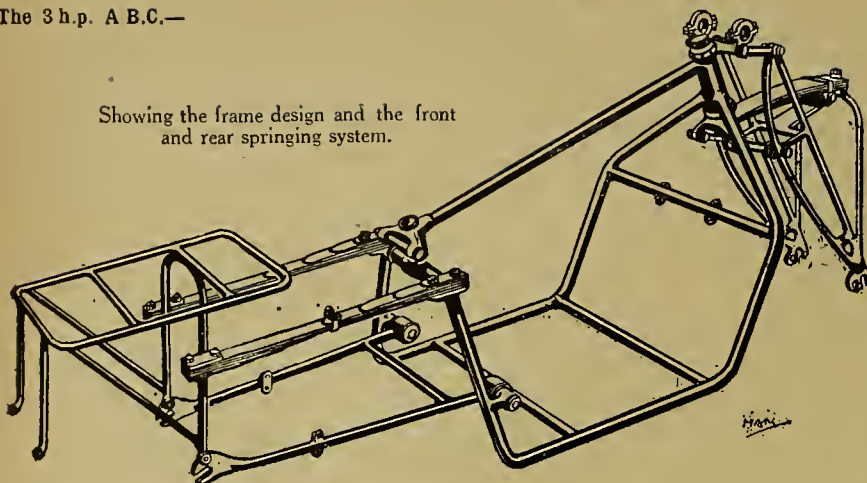
drive to the rear is by bevel, the bevel being in one piece with the splined shaft, and engaging with a substantial crown wheel running on two ball bearings in a casing behind the gear box. One end of this shaft carries the chain sprocket, while on the other end is a gear wheel running in oil, intended to drive the dynamo. The final drive from the sprocket to the rear wheel is by chain, the well-known A.B.C. "cush" drive being incorporated in the rear wheel sprocket. This is a system, it may be remembered, consisting of insulating the gear wheel from the shell attached to the hub by means of a series of large rubber buffers, which



Method of housing the power units. The ample front and under-shield is a commendable feature.

The 3 h.p. A.B.C.—

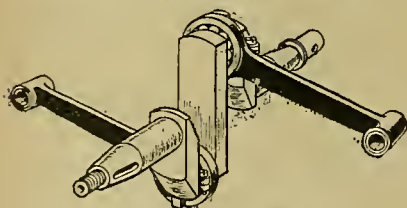
Showing the frame design and the front and rear springing system.



effectually take up the initial shocks of the engine, rendering the drive extremely smooth.

The change-speed lever works in a gate on the gear box and is of the rocking pattern, and similar to that found on Rolls-Royce and other first-class makes of cars. It enables the change-speed lever to be moved from side to side without the slightest effort, so that there is no danger of upsetting the rider's balance.

The carburetter is the standard A.B.C. pattern, and is warmed by means of a special jacket surrounding the branch from the main inlet pipe to the carburetter, which is connected by a small pipe to one of the exhaust ports. The position of this chamber is important, as it heats the mixture equally for each cylinder.



The crankshaft and connecting rods.

Since the oil supply is carried in the sump, the whole of the tank is available for petrol; so that the full capacity of well over two gallons can be devoted to the fuel. The mounting of the tank is ingenious. It is anchored rigidly at the rear while at the front it is carried on a light steel bracket cross-braced diagonally. This method of mounting, while ensuring a practically solid fixing, entirely relieves the tank of all frame stresses.

Frame Details.

The frame is a notable departure from standard practice. There is a single top tube, while the remaining members are duplicated, forming what may be termed "a double rectangular loop." The two main members are of sufficient width to accommodate the engine, and are so designed that in the case of a fall the engine is quite safe from damage. The forward and lower portions of the frame are filled in with sheet metal, so that the under portion of the engine is protected from mud—a most important matter—while the front extension protects the working parts of the engine and the rider. Air-ways are cut in suitable positions in

the tray, and are fitted with adjustable louvres, so that in the event of very bad weather being encountered, or necessity being found to pass a water splash, the draught may be cut off altogether, and the engine is then entirely protected. Even when these doors are closed, we are given to understand, unless the engine is driven to its fullest capacity, no overheating will ensue.

Underneath the bottom shield are two cross members, not shown in the illustrations, which serve to carry the power unit, and this can be removed by undoing four bolts. The rear portion of the frame naturally is sprung, and bears upon two roller bearings situated ten inches apart on the rear members of the frame. This arrangement gives great rigidity and lateral stability, while the roller bearings prevent wear at this point.

Springing System Minus Shackles.

Owing to the ingenious form of springing employed, no shackles are used. The springs are practically two quarter elliptical springs joined together at the thin end by the main leaf being common to both and forming the top of one set of spring leaves and the bottom of the other. At first sight, it would seem that the midway point must be weak, but since this is the point of flexure and there is no other stress at this point, such is not the case. There is no doubt that extreme flexibility is obtained, and the riding of the machine should be most comfortable.

Since the preliminary design of the 1919 A.B.C. was reproduced in *The Motor Cycle* of December 12th, 1918, some modifications have been made with regard to the spring fork. The spring is of the quarter elliptic type, and the thicker end is anchored to a special stay on the front axle, so as to do away with bending stresses on the head itself. All links and pins in the front fork work in bronze bushes. Adequate means is provided for lubrication, but in case of wear these parts can be replaced.

Instead of mounting the handle-bars in the usual manner, the A.B.C. handle-bar is carried in a special bracket forming part of the forks. This bracket allows of considerable adjustment, but does not allow the handle-bars to be twisted; consequently it is impossible for any accident to occur through slipping at this point.

All wires pass through the handle-bar, and the control is simple. For instance, as mentioned before, the left-hand grip works the clutch, beneath it is the exhaust lifter, while on the right bar is situated the front brake lever. The two other levers work the spark and throttle.

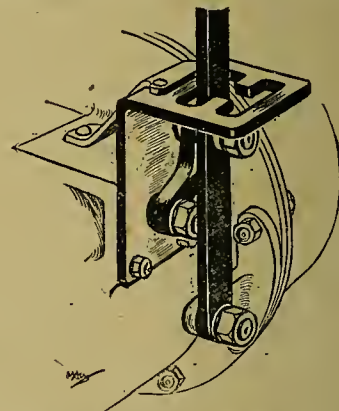
Internal expanding brakes are fitted to both wheels. Mention was made in previous articles of cone brakes, but it has been found that the internal expanding type is the most satisfactory from the constructor's point of view.

The Hubs and Brakes.

Even the hubs are designed by Mr. Bradshaw, and these are provided with a larger flange on one side than on the other, the larger flange being for the attachment of the brake drums, the bolts holding the drum on to the wheel being below the points of attachment of the spokes. The spindles in both wheels are withdrawable, so that if a tyre repair should be necessary either wheel can be easily removed.

Mention has previously been made of dynamo lighting. In this case, the dynamo will be carried below the crown wheel casing, and behind it there is just room for the battery.

A kick-starter will be provided for all models. On the undershield are mounted two aluminium plates upon which the driver's feet rest. Throughout the design points of convenience have been



Change-speed gate on the side of the gear box.

well studied, and every care has been exercised by the manufacturers to leave nothing undone for the rider's comfort.

An idea suggested to us by Mr. Bradshaw, which he may carry out, was the fitting of a toolbox underneath the crank case containing two drawers in which the tools are let into the solid wood, so that it is impossible for them to be damaged by rattling one against another.

The weight of the machine without fuel is 175 lb., and overseas purchasers will be interested to hear that the ground clearance is 6½ in.

The 1919 A.B.C. has now reached its final stage, and is ready to be handed over to the manufacturers to produce in quantities.

We cannot refrain from congratulating Mr. Bradshaw on the excellent design of the engine, and, indeed, of the whole machine, and wishing the Sopwith company success in its enterprise.

1919 Competitions — Olympia.

Interview with the General Manager of the Cycle and Motor Cycle Manufacturers' and Traders' Union.

.....
 No T.T. Race. Olympia Show, November 24th to 29th. The Question of the A.C.U. Six Days'.
 Prize Distribution Scheme for Clubs.

AS was only to be expected by all who are conversant with reconstruction difficulties, the manufacturers have definitely decided not to support a Tourist Trophy race this year.

This information was imparted last week to *The Motor Cycle* representative by Mr. Alf Bednell, the general manager of the Cycle and Motor Manufacturers' and Traders' Union.

It will be appreciated that conditions prevailing at the present time in the manufacturing world are such that the greatest effort is required to re-establish the industry in the motor cycle world, and that preparations for a T.T. race would retard the production of the new machines for which there is such a great demand. Many of the makers have not yet commenced delivery of even their pre-war models which they are reintroducing, and while these conditions prevail, the manufacturers naturally veto any suggestion to hold a T.T. race.

The Show.

Readers of *The Motor Cycle* will be pleased to learn that at a committee meeting of the Union held on Tuesday of last week it was decided to hold a show at Olympia from November 24th to November 29th inclusive. This gives a clear week between the closing of the car exhibition and the opening of the motor cycle show to enable the cars to be got out of Olympia and the motor cycle exhibits to be staged.

It has been decided to take over the S.M.M.T. scheme of stands and decorations, and to adapt them to the special requirements of the C. and M.C.M.T.U. show. This means that all stands will be uniform and in the hands of one contractor instead of the pre-war method of separate contractors for each exhibitor, which caused a great waste of labour—a question which must of necessity be closely considered this year.

International Exhibits.

Mr. Bednell advised us that the exhibition would be of an international character, goods of enemy origin only being barred. As hitherto, Olympia will be the only show at which will be shown representative motor cycles of the entire world, and no greater proof of British manufacturers' confidence in their products is needed to show that they do not fear foreign competition, since they invite their competitors in U.S.A. and the Continent to exhibit at the Union's own exhibition.

The Six Days Trial.

Although Mr. Bednell could tell us nothing authoritative concerning the attitude of the trade towards the proposed A.C.U. Six Days Trial for 1919, we gathered that while the makers do not think such a trial would be in any way conclusive, they would do their best to support the A.C.U., which they

hold in respect. If an A.C.U. trial is held, there is a feeling that it should be late in the year in order to permit them to enter their new models if possible. Hence, in all probability, the trial will be held in the late summer, but not later than September 29th, when summer time ends.

Quite a large percentage of makers are of opinion that the trial should be less than of a full week's duration, in order that the competitors would not have to be away for two week-ends as in the past. This would necessitate the trial being for about three days only, with one day for examination at the finish.

Standard Machines.

There also appears a decided tendency for the makers to favour a trial of standard machines with the gear ratios and sidecars usually sold by them instead of permitting the use of freak gear ratios, specially light sidecars, etc. This has frequently been advocated in *The Motor Cycle*, and is a view shared by the majority of our readers. But it must follow that, if standard machines are to be insisted upon, the course should not include freak hills which can only be climbed on freak gear ratios.

Prize Distribution.

Mr. Bednell further informed us that a competitions committee had been appointed to consider 1919 competitions, and that this committee is in communication with the A.C.U. on this matter. At the next meeting of the motor cycle section of the Union, the competitions committee will recommend that every encouragement be given to private clubs to hold local competitions confined to their members, and also that the pre-war Prize Distribution Scheme be resuscitated.

Altogether we were favourably impressed by the attitude of the Union on many matters affecting the rider, and no doubt there is a genuine desire on the part of the trade to improve the standing of the industry, both in the world of engineering and in the eyes of motor cyclists generally.

THE COST OF PETROL CONTROL.

THE question was asked in the House recently as to how many officers and servants there were in the Petrol Control Department, the amount of their salaries, and the total received from petrol licences during the year 1918. The reply was that the staff consisted of 438 persons whose salaries amounted to £39,620; in addition, ten civil servants were lent by other departments whose salaries totalled about £4,000 per annum. The motor spirit licence duty realised £278,091.

THE Whaley Two-stroke Engine.

An Engine-gear Unit to be Introduced by a Firm new to the Motor Cycle Industry.

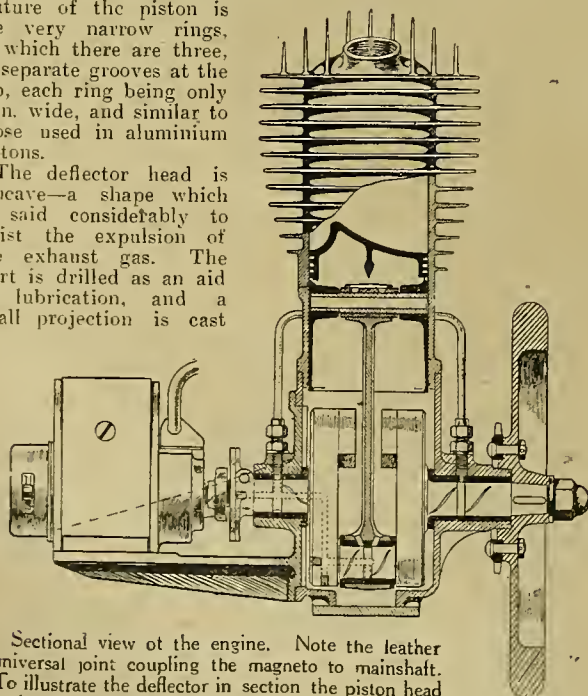
A NEW engine is always interesting to the motor cyclist, and an engine the production of which brings into the motor world a firm of engine unit manufacturers new to the industry is of unusual interest. The designer of the engine described, Mr. R. S. Whaley, of Edgbaston, Birmingham, is already well known, having been connected with several of the leading motor cycle firms for many years past. He has evolved a simple two-stroke engine and gear unit, and a carburetter which will embody certain departures from accepted practice, but of which the final design is not completed. High-class accurate workmanship in the best of material will be an outstanding feature. This engine will be marketed as a complete unit suitable for building into even the smallest lightweight frames, and at a very reasonable price.

We are not permitted to divulge at the moment the name of the manufacturers of the engine, but they are an old-established firm, and have gained high standing in other branches of mechanical work, their plant being capable of production on a large scale.

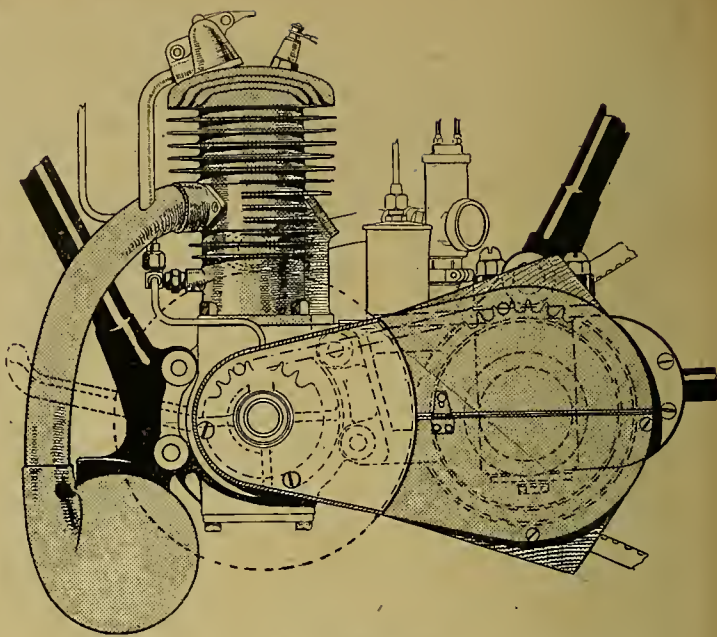
The engine has a bore of 69 mm. and stroke of 78 mm., giving a capacity of 292 c.c. It is therefore slightly larger than the average two-stroke lightweight engine. Its nominal h.p. is 2½, but on the bench we are told an experimental engine developed a full 5 b.h.p.—a very promising showing for any engine of this capacity. The cylinder is cast with a domed top, and has fins of ample area, which will be finished to a clean thin outline. Transfer, inlet, and exhaust ports present no new features, except that a small baffle is formed at the bottom of the transfer passage to prevent oil being thrown up on to its walls.

A somewhat unique feature of the piston is the very narrow rings, of which there are three, in separate grooves at the top, each ring being only ⅛ in. wide, and similar to those used in aluminium pistons.

The deflector head is concave—a shape which is said considerably to assist the expulsion of the exhaust gas. The skirt is drilled as an aid to lubrication, and a small projection is cast

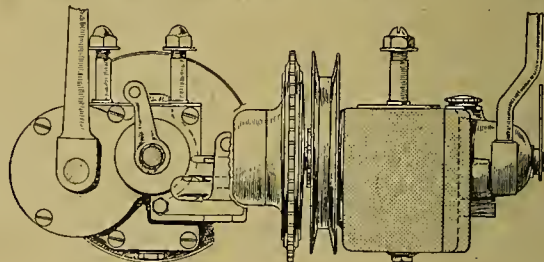


Sectional view of the engine. Note the leather universal joint coupling the magneto to mainshaft. To illustrate the deflector in section the piston head is shown separated from the skirt



General layout of the Whaley engine gear unit, showing chain case in position.

inside the piston head directly over the gudgeon pin, its function being to collect oil and drop it on to the little-end bearing. Another unusual feature of the piston is the gudgeon pin, which has three diameters, the largest of these being in one boss in the piston and the smallest in the other, the small end bearing working on the middle length. It is pinned at the smallest end. The connecting rod has a plain bearing split big-end, and the balanced

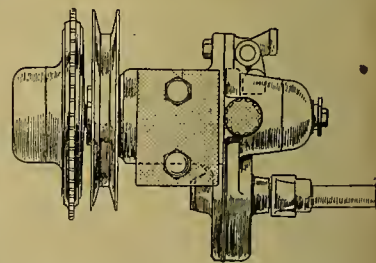


crankshaft is also on plain bearings.

Accessibility.

By removing the baseplate of the aluminium crank case, dividing the big end, and taking off the fly-wheel, chain and one oil pipe on the magneto side, the crankshaft, with the magneto and its platform, can be removed without taking the engine from the frame.

Another unique feature of the unit is the magneto drive. The detachable side plate of the crank case, which carries one of the main bearings, has cast integral with it a platform for the magneto, which is coupled directly to the crankshaft through a coupling which permits of easy adjustment when timing the engine. Whilst this arrangement necessitates the magneto projecting over the footboard, it is not in the way of the rider's feet so much as might be imagined. A neat



The two-speed gear box which incorporates a kick-starter and cork insert clutch.

The Whaley Two-stroke Engine.—

aluminium cover will be provided to prevent damage to the contact breaker. The saving in constructional cost by dispensing with chain drive and its cover plates is obvious.

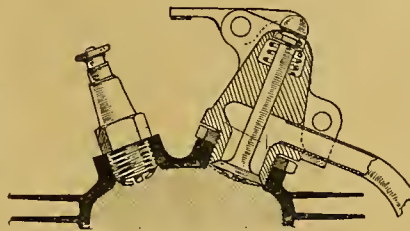
Lubrication.

It is intended to use a pressure feed oil pump on the tank, and three leads are provided—one to the cylinder wall and one to each of the main bearings. Drilled oilways in the crankshaft lead to the big end bearing.

A neatly designed compression release valve is disposed at an angle in the cylinder head, and a by-pass tube is taken from it into the exhaust pipe to obviate the objectionable hissing which occurs when the valve is made to exhaust into the open air.

The Transmission.

A short chain transmits the drive from a sprocket bolted on the inner side of the flywheel to a two-speed gear box, and is effectively enclosed in a substantial cover which is formed to cover the flywheel. This chain case has a hinged side plate, the opening of which exposes a considerable portion of the chain for inspection.



The domed cylinder head with a release valve and plug.

Two-speed Gear, Clutch, and Kick Starter.

All joints of the gear box are formed so as to obviate leakage, as the aluminium casing is designed to give a big oil capacity, in order that the gears will run in an effective oil bath. The gear wheels are machined in Ubas steel, and heat treated, the layshaft gear wheels being in one unit with phosphor-bronze bushes, and revolving upon a Ubas spindle.

The method of operating the gears is well designed, permitting easy adaptation to any frame. A simple geared kick starter is provided, together with a light pulley for the final belt drive, and a clutch of the cork insert type following accepted practice.

We understand that an experimental engine has been running on the road for some considerable period, and has given complete satisfaction.

No doubt many motor cycle manufacturers will be interested in the possibilities of this new engine with a view to adopting it as the power unit for one of their future models; and whilst at the moment the production of this proposition is only commencing at the present time, it is hoped to put a fairly large number on the market in the very near future.

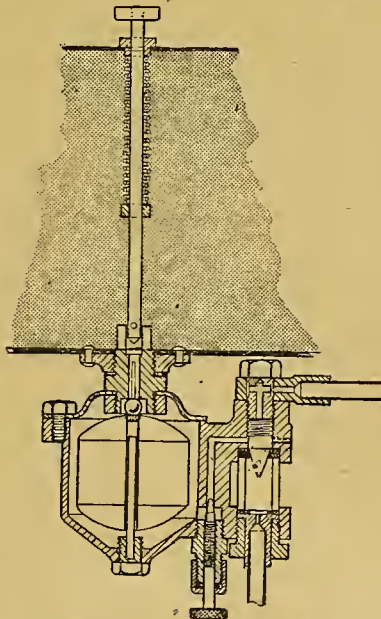
A NEW AUTOMATIC LUBRICATOR.

Drip Feed Device Controlled by the Throttle Lever.

A LUBRICATOR designed to supply oil to the engine in proportion to its speed and the work it is called upon to do is the invention of Mr. Robert J. Nash, of Herald Chambers, Martineau Street, Birmingham. It is a neat-looking device, somewhat resembling a miniature carburetter, intended to be fitted to the under side of the oil tank. It consists chiefly of a constant level reservoir containing a float, which regulates the supply from the tank by means of a ball valve.

In operation the oil is fed from the float chamber through a passage, having an adjustable orifice, to an airtight glass drip chamber, the upper end of which communicates, by a small bore tube, with the air intake of the carburetter; while at the lower end there is a small diameter passage opening into the end of a pipe which conducts the oil to the crank case.

The pressure reduction provided by the closed crank case of either a four or a two-stroke engine is in excess of that produced by the maximum flow of air through the carburetter; in consequence the oil feed has no tendency to do other



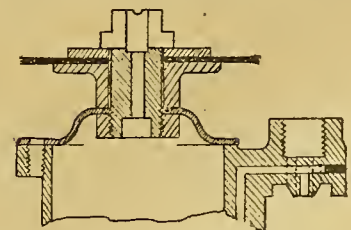
Nash's automatic lubricator in section showing the float chamber, and, at the top, the air suction pipe to the intake of the carburetter. The vertical tube at the bottom conveys the oil to the crank case.

than pass through the lower passage to the crank case. The orifices communicating with the carburetter and with the crank case pipe are so proportioned that the suction caused by the rising piston acting alone is only approximately sufficient to overcome the initial resistance of the oil feed, hence the value of the depression produced by the carburetter, as a ratio of the air flow, and therefore of engine speed, to regulate the proportion of the oil flow.

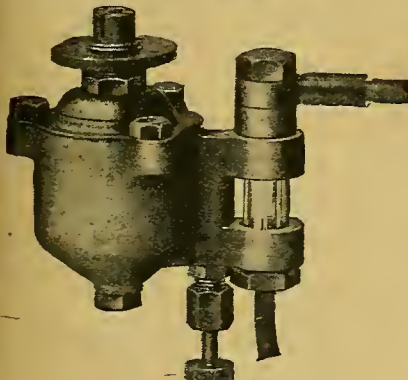
In action the suction of the air intake at the carburetter draws oil from its level in the feed passage to the small reservoir directly above the nozzle in the glass drip chamber; then the suction of the rising piston, aided by gravity, draws it through the small orifice in the floor of the drip chamber. A small needle valve, operated by a knurled nut, permits of adjustment of the drip similarly to the usual ordinary drip feed regulator.

One would assume, as the suction caused by the rising piston draws oil through this small passage, that the pressure when the piston descends would force it back again, or, at least in a two-stroke, the oil pipe would form a way of escape for the gas under compression in the crank case. In practice, however, this has not been found to be so, but, in any case, a small non-return valve in the lower end of the oil pipe would overcome this defect.

The body of the lubricator is of die-cast aluminium, with nickel-plated brass parts. The tank flange and the screwed parts carrying the device are of ample dimensions, and a simple cut-off valve is provided through the tank for use when the machine is not running. This latter does not appear to be entirely necessary, as the action of the float would automatically cut off supplies after a certain level in the chamber had been reached.



Alternative design of attachment to oil tank and drip arrangement.



Exterior of the Nash automatic lubricator.

THE BUYERS' GUIDE.

Current Prices and Delivery Dates for 1919 Motor Cycles.

SINCE we last published the Buyers' Guide in the issue of January 30th, there have been many additions to the list of makes, but very few alterations in the prices quoted. One British Excelsior two-stroke lightweight model is altered, and, instead of having a three-

speed counter-shaft gear with clutch at £62, a two-speed gear with clutch and kick-starter model is quoted at £60. The price of the Metro-Tyler is now £46, instead of £45, and the Velocette prices have been altered from £40 and £42 to £48 and £50. The Radco, on the other

hand, is now lower in price than first quoted, the single-gear model being £37 16s. instead of £42, quoted as an approximate figure. Interesting additions to the last list include the 3½ h.p. and 5-6 h.p. Rover and the Abingdon machines.

Make.	H.P.	Particulars in Brief.	Price.	Delivery.	Make.	H.P.	Particulars in Brief.	Price.	Delivery.
A.B.C.	3	Spring frame	£ s. d. 70 0 0	May.	JAMES	4½	No. 6, single, 3-speed	£ s. d. 89 5 0	Delivery commenced.
ABINGDON	3½	3-speed	85 0 0	Shortly.	JAMES	4½	No. 6, with sidecar	115 15 0	
ABINGDON	6-7	3-speed	100 0 0	Prices approx.	JAMES	3½	No. 7, V twin, 3-speed	89 5 0	
A.J.S.	6	Twin, 3-speed	105 1 0	Delivery commenced.	JAMES	2½	No. 8, 2-stroke, 2-speed	54 12 0	
A.J.S.	6	Sidecar combination	142 16 0	Delivery commenced.	JAMES	5-6	No. 9, twin, 3-speed	99 15 0	
ALLON	2½	2-stroke, 2-speed, clutch	55 0 0	Delivery commenced.	JAMES	5-6	Combination	126 0 0	Output booked until end of March.
ALLON	2½	2-stroke, 2-speed, clutch, and kick-starter	65 0 0	Delivery commenced.	LEVIS	2½	2-stroke, single-gear	38 0 0	
ARIEL	3½	3-speed	80 0 0	Delivery commenced.	L.M.C.	3½	3-sp. countershaft gear	73 0 0	
ARIEL	3½	Sidecar combination	106 0 0	—	L.M.C.	4½	ditto	75 0 0	
BLACKBURN	2½	4-stroke, 2-speed, clutch	60 0 0	—	L.M.C.	6	Twin ditto	86 10 0	
BLACKBURN	4	3-speed	82 0 0	—	MATCHLESS	8	Combination	140 0 0	Delivery commenced.
BLACKBURN	8	Combination	125 0 0	—	METRO-TYLER	2½	2-stroke, single-speed	46 0 0	Delivery now commenced.
BRADBURY	2½	4-stroke, 350 c.c., 2-sp.	63 0 0	—	METRO-TYLER	2½	2-stroke, 2-speed	52 0 0	Delivery commenced.
BRADBURY	4	Single, 3-speed, chain	82 0 0	—	MORGAN	8	Sporting model	145 0 0	Entire output for 1919 booked by various agents.
BRADBURY	6	Twin, 3-speed, chain	100 0 0	—	MORGAN	8	G.P., J.A.P. engine	150 0 0	Delivery commenced.
BRITISH EXCELSIOR	2½	2-stroke, 2-sp. counter-shaft, kick-starter	60 0 0	April.	MORGAN	8	De luxe, M.A.G. (w.c. J.A.P. £10 extra)	150 0 0	
BRITISH EXCELSIOR	2½	2-stroke, 2-speed	56 0 0	March.	NEW IMPERIAL	2½	J.A.P. engine, 2-speed	50 8 0	
BRITISH EXCELSIOR	2½	2-stroke, single gear	50 0 0	—	NEW IMPERIAL	2½	J.A.P. engine, 2-speed, clutch	58 16 0	
BRITISH EXCELSIOR	6 or 8	3-speed, combination	150 0 0	—	NEW IMPERIAL	8	Combination	126 0 0	
B.S.A.	4½	All-chain drive	81 15 0	Delivery commenced.	NEW RIDER	2½	2-stroke, single speed	48 0 0	At once
B.S.A.	4½	Chain-cum-belt	79 16 0	Delivery commenced.	NEW RIDER	2½	2-stroke, 2-speed	55 10 0	
CALTHORPE	2½	J.A.P. engine, 2-speed	52 0 0	Delivery commenced.	NORTON	4	All-chain drive	87 0 0	
CALTHORPE	2½	2-stroke, 2-speed	50 0 0	Delivery commenced.	NORTON	3½	T.T., c/shaft, all-chain	85 0 0	
CONNAUGHT M'ture	4	2-stroke, single-speed	34 0 0	Delivery now commenced.	NORTON	3½	Single-gear, B.R.S. eng.	73 0 0	
CONNAUGHT M'ture	2½	2-stroke, 2-speed	45 15 0	—	NORTON	3½	ditto, with B.S. engine	80 0 0	End of March
CONNAUGHT Stand'd	2½	2-stroke, single-speed	42 0 0	—	NORTON	3½	Standard, T.T., all-belt	63 0 0	
CONNAUGHT Stand'd	2½	2-stroke, 2-speed	49 15 0	—	P. and M.	3½	R.A.F. model	78 0 0	
CONNAUGHT Stand'd	2½	2-stroke, 2-speed, clutch	53 0 0	—	P. and M.	3½	Combination	102 0 0	
COVENTRY EAGLE	2½	2-stroke	47 5 0	Delivery commenced.	RADCO	2½	2-stroke, single-gear	37 16 0	Delivery now commenced.
COVENTRY EAGLE	2½	ditto, 2-speed	54 12 0	—	RADCO	2½	2-stroke, 2-speed	45 3 0	
COVENTRY EAGLE	2½	J.A.P.	47 5 0	—	ROVER	3½	Single-speed	67 0 0	
COVENTRY EAGLE	2½	ditto, 2-speed	54 12 0	—	ROVER	3½	Phillipson pulley	72 0 0	
COVENTRY EAGLE	3½	S.A. countershaft 3-sp.	82 19 0	—	ROVER	3½	3-speed	85 0 0	
DIAMOND	2½	J.A.P. Enfield 2-speed	60 18 0	Delivery now commenced.	ROVER	3½	Combination	117 10 0	Delivery commenced.
DOT	8	Combination	135 0 0	—	ROYAL RUBY	6 or 8	3-speed	100 0 0	
DOT	2½	Twin, 2-speed	65 0 0	—	ROYAL RUBY	2½	Combination	132 10 0	
DOT	2½	Twin, 2-speed	55 0 0	—	ROYAL RUBY	2½	Twin, 3-speed	105 0 0	
DOUGLAS	2½	W.D. model	60 0 0	Delivery commenced.	ROYAL RUBY	2½	2-stroke, single-gear	40 0 0	
DOUGLAS	4	W.D. model	75 0 0	—	SPARKBROOK	2½	2-stroke, single-speed	46 4 0	Shortly.
DOUGLAS	4	Combination	95 0 0	—	SPARKBROOK	2½	2-stroke, 2-speed	52 10 0	
ENFIELD	2½	2-str., 2-sp., chain-drive	52 10 0	—	SUNBEAM	3½	3-speed, all-chain	120 15 0	
ENFIELD	3	4-stroke, twin, 2-speed	69 6 0	—	SUNDEAN	8	3-speed, single-gear	40 0 0	
ENFIELD	6	Combination	115 10 0	—	SUN-VITESSE	2½	2-stroke, single-speed	52 0 0	
ENFIELD	8	Combination	117 12 0	—	SUN-VITESSE	2½	2-stroke, 2-speed	52 0 0	Provisional prices only.
G.N. CYCLE CAR	10	2-cyl., Standard model	140 0 0	Early in April.	TRIUMPH	4	W.D. model	87 0 0	
G.N. CYCLE CAR	10	2-cyl., Vitesse model	170 0 0	—	TRIUMPH	2½	2-stroke, 2-speed	54 0 0	
HUMBER	3½	Flat twin, 3-speed	85 0 0	End of March.	VELOCETTE	2½	2-stroke, 2-speed	48 0 0	
IVY de Luxe	2½	2-stroke, single-speed	42 0 0	—	VELOCETTE	2½	2-str., 2-sp., lady's mod.	50 0 0	
IVY de Luxe	2½	ditto, 2-speed	50 0 0	—	WOOLER	2½	2-stroke, variable gear	61 19 0	April.
IVY de Luxe	2½	I.O.M. model, single-sp.	45 0 0	—	WOOLER	2½	Flat twin, 4-stroke	61 19 0	
IVY de Luxe	2½	ditto, 2-speed	53 0 0	—					
IXION	2½	2-stroke, single-speed	42 0 0	—					
IXION	2½	2-stroke, 2-speed	50 0 0	Delivery commenced.					
IXION	2½	2-stroke, 2-speed, lady's	56 0 0	—					
IXION	2½	2-stroke, sidecar	68 10 0	—					

ROAD REPORTS.

Owing to the heavy R.A.F. lorries, part of the Westerham Road has subsided between Biggin Hill and the "Fox and Hounds." The road runs on the top of the chalk hills, and a warning board has been erected, urging drivers of traffic to keep to the centre of the road. The road has subsided several feet and further trouble is feared. Road-menders last month were breaking the

ice in the larger holes of the road with pickaxes, and filling with stones. A very rough and ready method!

Warrington-Preston.—Fair. But roads in the Wigan district are very bad.

Preston-Lancaster.—Excellent, except for one bad patch near Lancaster.

Lancaster-Kendal, *via* Milnthorpe.—Perfect nearly all the way. A little broken near Kendal and Milnthorpe.

Kendal to Newby Bridge, *via* Crook.—Good.

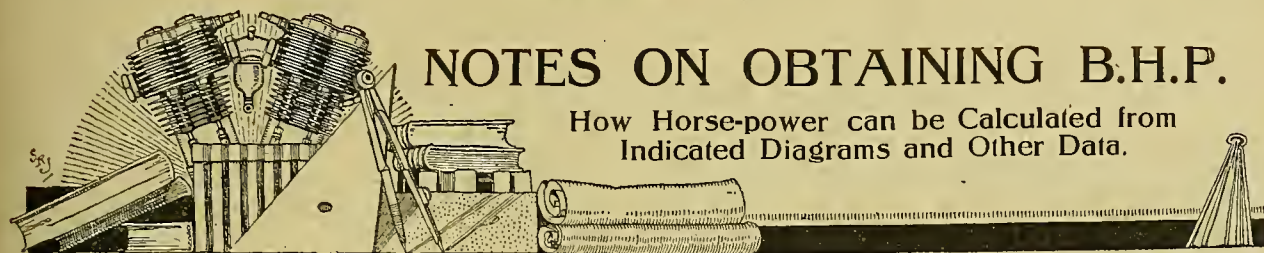
Newby Bridge-Ulverston.—Good, except for three or four bad patches.

Ulverston-Barrow.—Good, except in about six places, where the surface is in an appalling condition.

The Coventry-Birmingham road is good, except within the Coventry boundary and on Meriden Hill.

NOTES ON OBTAINING B.H.P.

How Horse-power can be Calculated from Indicated Diagrams and Other Data.



IN these notes it is proposed to show a method of working out the b.h.p. of a four-stroke petrol motor from the general dimensions of the engine and its indicator diagram. As it is clearer to select and fully work out an example than to deal in general terms, we will take an engine of the following dimensions:

Bore 3 in., stroke 4 in.

Area of piston head, 7 sq. in.

Maximum of r.p.m. permissible, 2,000.

r = radius of crank pin circle = $\frac{1}{2}$ ft.

l = length of connecting rod = $\frac{2}{3}$ ft.

x = ratio l/r = 4.

w = weight of reciprocating parts = $1\frac{1}{2}$ lb.

The indicator diagram is a graph showing the pressure in the cylinder throughout the cycle plotted against the position of the piston in its stroke, i.e., the volume of gas in the cylinder.

To obtain the diagram by actual test, involves the use of a special indicator, but if the maximum pressure of explosion, the compression pressure, and the pressure at the end of the working stroke are known, we can construct the diagram as the curves of compression and explosion follow equations which are approximately known. Fig. 1 represents the diagram obtained in this manner, the known pressures being taken as 300, 80, and 30 lb.-sq. in. respectively for this engine. For simplicity we shall not be far wrong in assuming the pressure during induction and exhaust as atmospheric (15 lb.-sq. in.) and the explosion as instantaneous, i.e., at constant volume. The first

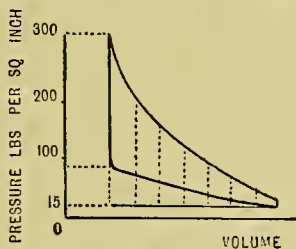


Fig. 1.

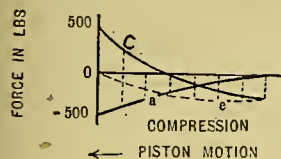


Fig. 2.

step is to obtain the force on the gudgeon pin during the cycle, taking into account the atmospheric pressure on the crankshaft side of the piston, and the area of the piston. We therefore take a number of pressure values from the curves in fig. 1, deduct 15 lb.-sq. in. from each, and multiply the result by 7 (piston area). This gives us curves a and b (figs. 2 and 3), showing the force in lb. on the gudgeon pin due to the gases in the cylinder during compression and explosion respectively, the former being, of course, negative, as it tends to retard the engine. The next step is to ascertain the effect of the inertia of the reciprocating parts. If at any point in the stroke the angle traversed

by the crank from top dead centre is " α ," then at that point the force in lb. on the gudgeon pin due to inertia = $\frac{wv^2}{gr} \left(\cos \alpha + \frac{1}{x} \cos 2 \alpha \right)$

Where v = velocity of crank pin in ft.-sec., g = acceleration due to gravity = 32 ft.-sec.², and the other symbols have the meanings given above. In our case, $v = \pi \times \text{stroke} \times \text{revs. per sec.} = 35^2$ ft.-sec.: and therefore $\frac{wv^2}{gr} = \frac{1\frac{1}{2} \times 35^2}{32 \times \frac{1}{2}} = 344.5$.

Our formula may now be written $344.5 (\cos \alpha + \frac{1}{4} \cos 2 \alpha)$.

Then when $\alpha = 0^\circ$, inertia = $344.5 (1 + \frac{1}{4}) = 430.6$ lb. Again; when $\alpha = 180^\circ$, inertia = $344.5 (-1 + \frac{1}{4}) = -258.4$ lb.

And if $\alpha = 77^\circ$, $\cos \alpha = .2250$, $\frac{1}{4} \cos 2 \alpha = \frac{1}{4} \times -.8988 = -.2247$, and hence the inertia is zero.

By giving a number of intermediate values to α and working out the corresponding inertias, we get the inertia curves c and d (figs. 2 and 3), the inertia being taken as positive where it tends to accelerate and negative where it tends to retard the engine. (Note.—For this we have to obtain the position of the piston corresponding to each value of α , either by a formula or a graphical method.) By now adding the values at various points of the curves a and c , also b and d , being careful to note where positive and where negative, we get curves e and f , which represent the actual net force in lb. on the gudgeon pin for all points of the compression and explosion strokes.

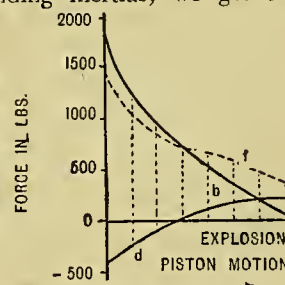


Fig. 3.

Unfortunately, this force has to be transmitted through the connecting rod. Hence it is split up, part appearing as a force at right angles to the crank acting on the crank pin, called the *crank effort*, which does useful work; another part appearing at right angles to the line of stroke forms the *side thrust* of the piston against the cylinder, and again another part acting at

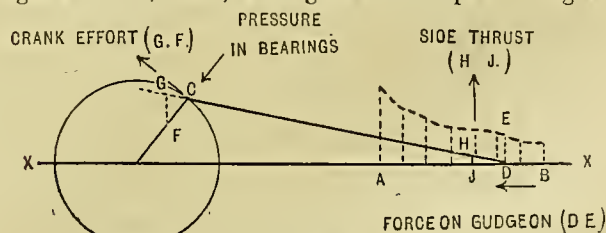


Fig. 4.

Notes on Obtaining B.H.P.—

right angles to the crank effort and forming the pressure on the bearings.

An easy graphical method of obtaining the first two forces is shown in fig. 4. On XX as the centre line of the engine we lay off the stroke AB, and dotted curve. At the correct distance and to scale we describe the crank pin circle. Then, for example, at the point D in the stroke, DE represents the net force in lb. on the gudgeon pin, CD being the connecting rod. Set off CF along the crank and DJ along XX, each to equal DE. Draw FG at 90° to XX, cutting CD produced at G, and draw JH at 90° to XX, cutting CD at H. Then to the scale of DE, FG represents the crank effort and JH the side thrust, in lb.

If we take a number of these force values from curves *e* and *f*, and present the results as in figs. 5-6, we get curves *g* and *h* showing the crank effort in lb. (and also torque, since crank effort \times length of crank = torque) and curves *i* and *j* showing the side thrust in lb., for all points of the compression and explosion strokes (fig. 6).

It will easily be seen that the crank efforts due to the inertia forces during exhaust and induction will balance out as far as torque taken over the whole cycle is concerned, but we cannot neglect their side thrust effect. We therefore apply inertia values from curves *c* and *d* to fig. 4, and so obtain the side thrust curves *k* and *l* which are shown in fig. 6.

Now we have all the particulars required. First, from crank effort curves *g* *h* we find that the average crank effort during compression and explosion is

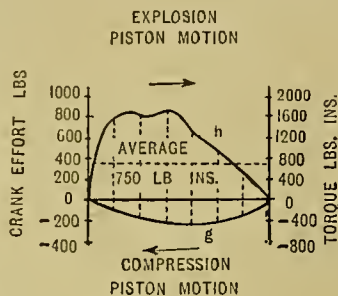


Fig. 5.

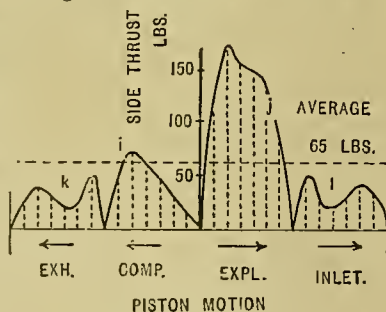


Fig. 6.

375 lb., or, since the length of the crank is $\frac{1}{6}$ ft., and the crank effort is acting at right angles to the crank throughout, then average torque = $\frac{375}{12} \times 2 = \frac{187.5}{3}$ lb.-ft. (The average value is obtained by

taking a number of values from the curves, and dividing their sum by the number taken.) The work done by the torque per minute = $\frac{187.5}{3} \times 2\pi \times \frac{\text{r.p.m.}}{2} = 1,178,571 \div 3$ ft.-lb. (the torque being only available for one rev. out of two, we multiply by r.p.m. $\div 2$.)

Next, we utilise our "side thrust" curves to ascertain the losses due to piston friction, for friction is dependent on this thrust.

At this high speed, and with a small engine, the "coefficient of friction" might amount to .25, i.e., we assume retarding force on piston due to friction = side thrust $\times .25$. Now from our side thrust curves *i*, *j*, *k*, *l*, we find the average thrust during the cycle = 65 lb.

Therefore friction loss (due to piston) per minute = $65 \times .25 \times \text{stroke} \times \text{strokes per minute} = 16.25 \times \frac{65,000}{3} \times 4,000 = \frac{65,000}{3}$ ft.-lb.

So as not to inflict on the reader the process of determining the bearing and valve gear losses, we will assume that they amount to .6 of our piston friction loss.

Then total loss of work per minute = $1.6 \times \frac{65,000}{3} = \frac{104,000}{3}$ ft.-lb.

Now we have already determined work done by torque per minute = $\frac{1,178,571}{3}$ ft.-lb.

Hence useful work available from crankshaft = $\frac{1,178,571}{3} - \frac{104,000}{3} = \frac{1,074,571}{3}$ ft.-lb. per minute.

This is equivalent to $\frac{1,074,571}{3 \times 33,000} = 10.85$ b.h.p.

This power is high for the engine dimensions, it will be noted, because, for the sake of simplicity, the indicator diagram is drawn with no heat losses effect shown. Actually, a number of losses occur tending to reduce the gas pressure during the explosion stroke, and hence to reduce the power obtainable. "B. ENG."

The Benzole Position.

THE Automobile Association has issued a circular to its members from which the following is an extract: "While every possible means of relief is being vigorously sought, it is unpleasantly true that British benzole, every gallon of which should be used in Britain, is not being so used. Worse, vast quantities are being exported. This is a national calamity. Producers are not to blame. Distribution difficulties are acute; drums and tins are scarce. Co-ordination of supply is wanting. The National Benzole Association has been formed; its leaders are earnest business men. They tell us plainly that home-produced benzole shall be conserved to the use of British motorists if organised

British motoring will do its share. A standard specification has been prepared; all the responsible benzole producers will conform. It is at once our national duty and to our common interest to use benzole. Distribution is a knotty problem. It is being solved. Meanwhile, let us all make a start in however small a way. Buy British benzole always through your local A.A. agent. We can help you—we will help him. Buy benzole in fifty-gallon drums and keep it twenty feet from a dwelling place. The regulations are not difficult to comply with. Alternatively, get the local A.A. agent to store it for you. A large supply of fifty-gallon drums has been secured by the A.A. which can be hired."

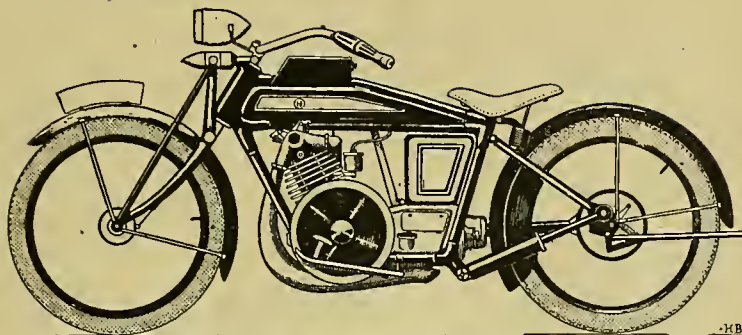
An Example of French Design.

A Novel Adaptation of the Unit System of Construction.

OF more than passing interest is the motor cycle design submitted as an "ideal" by M. Henri Boursiac, of Rouen, which we illustrate on this page. The machine embodies many attractive features, including a spring steering pillar, spring frame, unit engine and gear, and side-by-side twin engine placed at an angle of about 36° from the vertical. The appearance of the machine is distinctive, but quite neat, and the spring frame does not involve any unsightly appendages.

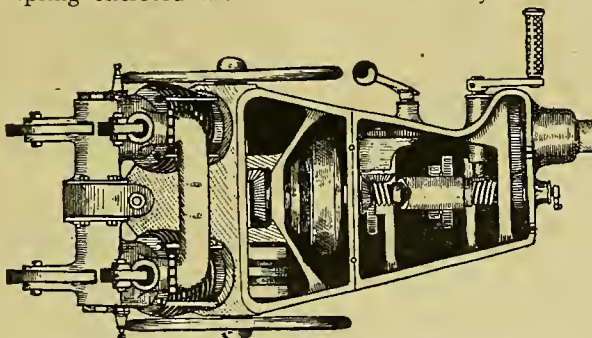
The spring fork is somewhat similar to that of the Triumph, but in addition a vertical movement is provided by a substantial helical spring enclosed within the steering head, while for the rear springing the back fork stays are hinged just under the saddle and retained in the normal position by a telescopic spring-loaded stay from the bottom bracket. This construction, having four fairly distant points of attachment to the main frame, should overcome the lateral play bogey to a large extent. At the same time it necessitates special construction of the final drive.

A frame of the duplex type is embodied, and forms a cradle for the housing of the unit system and gear box. Other items in the cycle part of the specification include adjustable handle-bars incorporating twist-grip controls, an expanding brake on the front wheel, and a friction disc brake on the rear wheel. The front brake is operated by a lever on the handle-bar and the rear brake by the usual pedal.



A French reader's ideal design, embodying an inclined twin-cylinder engine with an overhead camshaft and a three-speed gear box integral with the engine.

It is intended that the side-by-side two-cylinder engine of 70 mm. x 80 mm. bore and stroke be built as a unit with the gear assembly, and ready access to all parts obtained by means of quickly detachable covers. The cylinders are set at an angle of about 36° from the vertical, and are provided with detachable heads which embody the valve seats, supports for the overhead camshaft casing, and pairs of lugs for the valve rocker spindles. Valve guides are screwed into this casting, and the valves inserted from the inside.

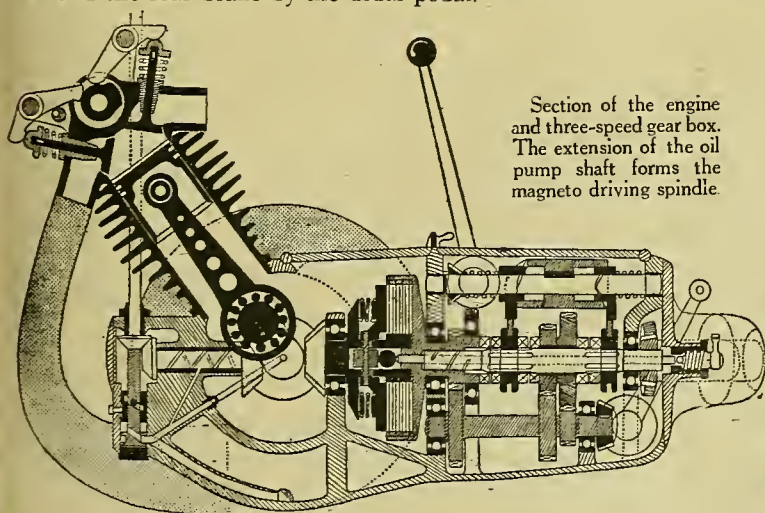


Plan view of the engine and gear box with the inspection cover of the latter removed.

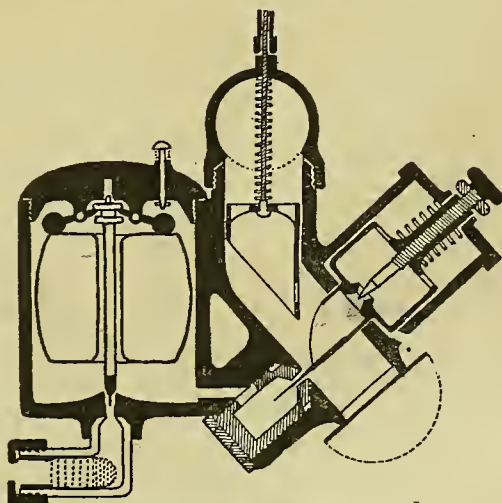
The camshaft is shown as being driven by a vertical shaft between the two cylinders from a bevel on a cross shaft, which in turn is driven through bevels by the crankshaft. Both driving shaft and camshaft are enclosed in neat cases.

Under the exhaust rocker is an eccentric arrangement which acts as an "exhaust lifter." Roller bearing big ends are provided, working on the two-throw 180° crankshaft, which is drilled to form oil ducts.

Forced feed lubrication is employed, operated by a reciprocating pump situated at the lower end of the magneto driving shaft, which latter is rotated by a



Section of the engine and three-speed gear box. The extension of the oil pump shaft forms the magneto driving spindle.



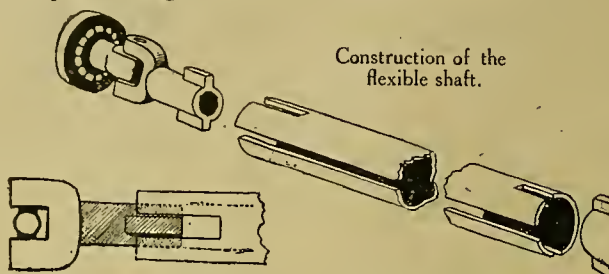
The adjustable carburettor in section

An Example of French Design.—

bevel gearing from the crankshaft. The circulated oil returns to the large sump from which it is drawn by the pump through a filter. Contrary to usual practice, the neatly enclosed magneto and dynamo are intended to be situated on top of the tank and driven by the aforementioned shaft.

Two flywheels are shown—one at each end of the crankshaft which runs in three ample bearings. The drive is by bevel to a substantial multiple-plate clutch, the outer portion of which is in one with the primary gear box pinion, which latter is bored to receive the splined secondary shaft. The gear arrangement is of the usual six-wheel type with three sliding dog clutches, providing three speeds, with direct drive on top. A kick-starter operates through the layshaft.

A pair of gears at the end of the main shaft sets the final drive to one side. This carries the shaft out far enough to clear the rear wheel without excessive angle on the universal joint. The shaft between the gear box and the final bevel should be flexible owing to its being tubular and split down one side, as shown in the sketch on this page.



The designer has also evolved a carburetter intended primarily for this machine, but it appears to have possibilities for use on any other type of engine. Reference to the section will show that the instrument consists of the usual bottom-feed float chamber with a passage leading to the jet opening into the throttle barrel. Opposite the jet, in a special chamber, is a kind of spring-loaded piston with an extension which forms an air throttle. To this extension is attached a

needle which regulates the jet opening. The action is as follows: Opening the throttle causes a depression in the barrel or jet chamber and in the cylinder piston chamber. This causes the piston to be raised, more or less as the regulating needle is adjusted, and the air throttle is opened, at

the same time the jet orifice is increased by the lift of the needle. The whole action, therefore, is automatic, and the occasional regulation to suit climatic conditions may be made by the milled adjusting screw in the piston chamber.

So far this machine exists only on paper, but there are so many desirable features which will appeal to the majority of motor cyclists that we would welcome its realisation as a concrete fact.

Engine and Gear Box Lubrication.

Some Extracts from a Paper read before the I.A.E.

THE recent paper read by Capt. G. W. A. Brown before the Institution of Automobile Engineers, entitled "The Lubrication of Motor Cars," contains one or two points of interest to the motor cyclist. The first concerns the physical characteristics of engine lubricating oil, showing the effects of use in a petrol engine on its composition and properties. Capt. Brown said:

"It is usual practice in engine lubrication to fill the sump with a given quantity of oil, which remains in use up to two or three thousand miles' running. The longer the oil is used the thicker and darker it becomes, and, in order to ascertain the degree of deterioration caused by long periods of running, analyses were taken from—

"(a) A standard proprietary brand of lubricating oil.

"(b) The same oil after 100 hours' running in an aviation engine under full load.

"As a slight reduction is shown in the coefficient of friction, it is reasonable to suppose that this will continue to increase with the age of the oil. The original lubricating oil was of a yellow-green colour and free from sediment, whilst, after 100 hours' running, it became deep black. On examination, this oil was found to contain a considerable quantity of carbon specks or particles in suspension. These particles, magnified fifty diameters, gave a dimension of 0.001 mm., and were so fine as to pass all the usual methods of filtering. We were able, however, to separate the carbon specks by filtering through 3% fuller's earth, or with animal charcoal. The solid carbon particles so extracted amounted to 0.1%, carry-

ing also some traces of finely divided iron and copper. Samples of oil were tested on a Thurston machine, and the figures given prove the theory that the specific gravity is entirely independent of the viscosity, as, after use, the specific gravity has increased, while the viscosity has decreased."

Gear box lubricating methods were also criticised and suggestions made. The author went on to say that "A test of a gear box was undertaken by the National Physical Laboratory which gave the efficiency of the direct drive as being only 74% when the box was full of oil, while, when a quarter full, the value was 97.5%. It is evident that, had grease been the lubricant, the efficiency would have been lower still.

"A method of oiling the wheels of a gear box by making each dip into a trough in which oil is maintained at a constant level by a pump is suggested.

"It has always been the author's practice to put only sufficient oil in the gear boxes of racing cars to enable the teeth of the largest wheel alone to dip, but the best method would appear to be to cause a jet of oil to play upon the intersection of the gears on the side of engagement. In this design, white metal bearings are fitted for the shafts, and they are oiled under pressure; it is the author's experience that these are preferable to ball or roller bearings, making, as they do, a quieter and sweeter-running gear box, without diminishing efficiency. In any case, it seems an unnecessary refinement to fit ball bearings to a device which, as usually lubricated, is more fitted for determining the mechanical equivalent of heat than anything else."

CURRENT MATTER

Times to Light Lamps.

GREENWICH TIME.

Mar. 13th	...	6.28 p.m.
" 15th	...	6.31 "
" 17th	...	6.35 "
" 19th	...	6.38 "

New Registration Letters for London.

The London County Council has added LW to the seventeen other index marks now in use for automobile registration.

The M.C.C. Smoking Concert.

At this smoking concert, which is to be held at the Queen's Hall on March 21st, a collection will be made towards the funds of the St. Dunstan's Hostel for blinded soldiers. It is hoped that a substantial sum will be raised for this very worthy institution.

The Roads.

A recent memorandum by the Road Board to the Reconstruction Committee places, as a conservative estimate, the figure of £37,000,000, which must be expended at once on reconstruction of roads and bridges, apart from the question of deferred maintenance, which it is estimated will involve a similar outlay.

The Industrial Reconstruction Council.

The sixth lecture of the series arranged by the Industrial Reconstruction Council will be held in the Saddlers' Hall, Cheap-side, E.C.2, on Wednesday, March 19th. The chair will be taken at 4.30 by the Rt. Hon. the Lord Mayor of London, Sir Horace Marshall, LL.D., and a lecture, entitled "The Functions of Government in Relation to Education," will be delivered by the Rt. Hon. H. A. L. Fisher, M.P., President of the Board of Education. Applications for tickets should be made to the secretary, I.R.C., 2 and 4, Tudor Street, E.C.4.

Motor Cycle Design.

The paper on current motor cycle design by Mr. D. S. Heather, which was read before the Institution of Automobile Engineers, created a great deal of interest among motor cycle manufacturers. A good deal was said in the discussion to the effect that many of the points raised by the author had already received attention, but there appeared to be an admission that as manufacturers had found a ready market for the whole of their output they were disinclined to make drastic alterations. It is hoped that the makers and designers will take a stronger line in the discussion of the next paper, to be read at Birmingham on March 20th, which will deal with the design of the engine of the sidecar machine.

Special Spring Number on April 3rd.

Three weeks hence the annual spring number of *The Motor Cycle*—an issue keenly anticipated in pre-war days—will be published. Features of an attractive nature appealing to all tastes are in hand.

Looking Ahead.

There are makers who, at the present time, are making up the balance of their pre-war stock, proceeding with all speed on their real 1919 models, are experimenting with their 1920 machines, and have on paper the nucleus of their 1921 models.

Our Stocks of Petrol.

On February 24th it was reported that there were twenty million gallons of petrol imported solely by the Government, apart from aviation spirit and motor transport spirit. There are, moreover, additional stocks of petrol purchased by traders since the Government ceased to be the sole importers, so there is no question of shortage now. How much longer shall we be burdened with the Petrol Control Department, its wretched coupons, and the miserable super-tax?

Died on Service.

We regret to have to record the death of Mr. Ernest Parkes, son of Mr. Thomas Parkes, one of the directors of the Sun Cycle and Fittings Company, Ltd. Mr. Ernest Parkes was a member of the Birmingham M.C.C., and, prior to the war, took part in a considerable number of competitions.

Special Features.

1919 COMPETITIONS — OLYMPIA.

A FOUR-CYLINDER MOTOR CYCLE
BUILT BY ITS DESIGNER.
NOTES ON OBTAINING B.H.P.

U.S. Service Machines.

According to a Washington (D.C.) report, it is estimated that 34,800 motor cycles are used by the U.S. Army.

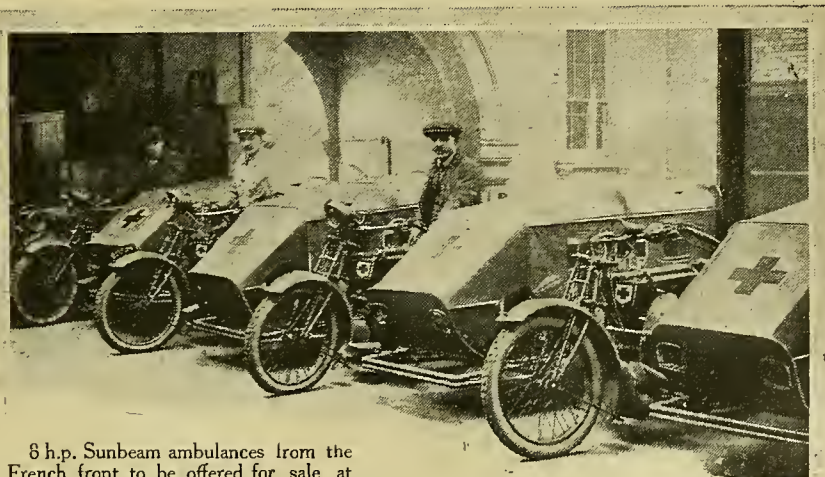
The Next Motor Show.

In connection with the November Motor Show at Olympia, the S.M.M.T. has decided that, whilst the Exhibition will be fully international, no goods of enemy origin will be allowed to be shown. This decision is comprehensive, and means not only that no German or Austrian cars will be allowed to be exhibited, but that no tyres, parts, accessories, or fittings of any kind, from enemy countries will be permitted.

A Motor Cycle Stolen.

Between 5.30 and 6.15 p.m. on Tuesday, the 4th inst., a 1919 8 h.p. Sunbeam combination, finished in black and gold, registered number AU 1773, the property of Dr. Davies, St. Thomas's Hospital, was stolen from outside the Hospital enclosure, in spite of the fact that the hospital porter had been asked to keep an eye on it. Any information with regard to this machine should be communicated to Dr. Davies, St. Thomas's Hospital, Albert Embankment, London, S.E.1.

AN OPPORTUNITY FOR MUNICIPAL AUTHORITIES.



8 h.p. Sunbeam ambulances from the French front to be offered for sale at Aldridge on the 19th inst.

A Scooter T.T.

Considering that there are only a few motor scooters in this country, *The Daily Mail's* announcement that a race for scooters is being arranged, appears to be rather absurd.

Calcium Carbide.

The Minister of Munitions has announced that the Calcium Carbide Order of 1917 has been suspended. It is, therefore, now permissible for traders to deal freely in carbide without a permit.

Ariel Prices.

At the moment of going to press, we are advised of an advance in Ariel prices over those shown in the "Buyers' Guide" this week. The $3\frac{1}{2}$ h.p. model is now £85, the sidecar outfit £115. The price of the 5.6 h.p. combination is £130.

A Motor Cyclist-car Designer.

The announcement of a new British sporting car to be designed by Captain W. O. Bentley, M.B.E., R.A.F., was made in last week's *Autocar*. Captain Bentley will be recalled as one of three brothers Bentley, all one-time enthusiastic motor cyclists, who occupied prominent positions in the competition world some years ago.

New Models in "The Motor Cycle."

Continuing our many first descriptions of new model motor cycles, we are this week able to introduce the new 3 h.p. A.B.C., a motor cycle, the advent of which has been eagerly awaited by thousands of riders. The designer, Mr. Granville E. Bradshaw, is also responsible for the Dragonfly aero engine, a radial type nine-cylinder engine, of over 300 h.p., one of the latest engines adopted for the British Air Service.

Where are the Motor Thieves?

A well-known Coventry motor cyclist, who is somewhat absent-minded, relates a surprising experience. Attending a meeting in Birmingham, he left his Powerplus propped up against the kerb, and forgot it. He returned to Coventry by train, and it was the next morning before he remembered his machine. Naturally he rushed back to Birmingham by the first available train. To his astonishment, the machine was precisely where he had left it.

The A.J.S.

Through a printer's error, an illustration of the 1919 A.J.S. given in last week's issue was described as a spring frame model. This is anticipating matters somewhat, but a 1920 spring frame A.J.S. is not improbable.

An Endrick Cycle Car.

A three-wheeler on novel lines will be put on the market shortly by the Endrick Engineering Co., formerly of Olton, Warwickshire, but now of Crawley, Sussex.

A Three Days Trial.

This year's "six" days reliability trials may whittle down to a three days event. It may prove the only really important competitive event in 1919, and it is expected that by early September manufacturers' post-war models will be ready for entry.

Annual Spring Number, April 3rd.

The Annual Spring Number of "THE MOTOR CYCLE," so appreciated before the war, will be revived on April 3rd. The issue for this date will be greatly enlarged, and will contain a number of special articles appealing to every motor cyclist.

Horse-power Rating.

In our leading article the recommendation is made that motor cycle engines be rated upon their capacity, 100 cubic centimetres to represent 1 h.p. The present nominal horse-power rating of engines is unsatisfactory, not to say confusing, to the novice.

Despatch Riders and their Mounts.

Maj.-Gen. Sir A. R. Crofton Atkins, K.C.B., C.M.G., Ministry of Supply, has replied to the letter sent by Mr. T. W. Loughborough, secretary of the Central Office Motor Cycle Reserve Committee. He says the suggestion put forward that "special provision should be made to enable the motor cycle despatch riders of any branch of the service to purchase, on demobilisation, the motor cycles they have been using on duty," will have sympathetic consideration.

THE DISPOSAL OF ARMY MOTOR CYCLES.

Two hundred motor cycles will be sold at the Royal Agricultural Hall, Islington, to-morrow, Friday; while five 8 h.p. Sunbeam ambulance sidecars will be offered at Aldridge's, St. Martin's Lane, on Wednesday, the 19th.

The Ministry of Munitions has now made considerable progress in connection with the arrangements for selling surplus war material.

Mr. F. G. Kellaway, M.P., chairman of the Surplus Government Property Disposal Board, has already prepared the general plan of action, and during the next few months the public will have exceptional opportunities for securing a great deal of useful material.

A Special Salvage Committee has been set up, which will deal particularly with the matter of the scientific utilisation of what might otherwise appear to be "scrap" of little or no value.

Many applications are being received from ex-service men who wish to obtain motor bicycles, etc. In this connection it must be pointed out that, except where material is put up to public auction, the Ministry will not be able to act as retailers to private individuals. It is hoped, however, that the various associations which exist, and which are looking after the interests of discharged men, will put themselves in communication with the Ministry.

Brig.-Gen. J. G. Weir, C.M.G.

A dinner was given on March 6th by the officers past and present of the Technical Department (Air Ministry) in honour of Brigadier-General J. G. Weir, C.M.G., who is retiring from the position of Controller of the Technical Department.

Imports and Exports.

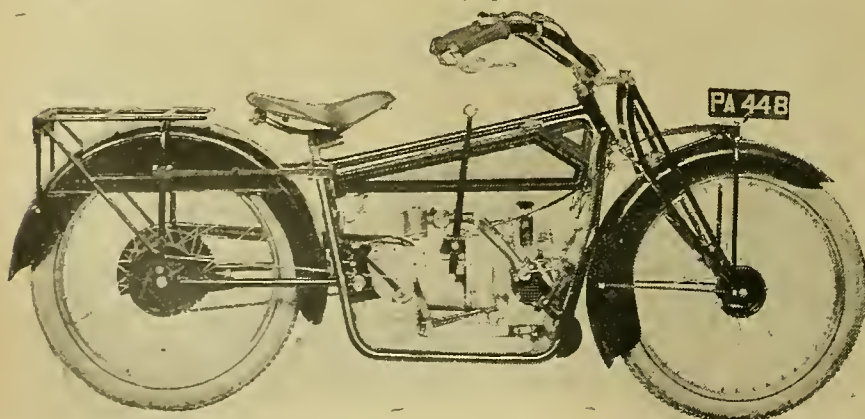
The increase in the value of the imports in motor cycles (for the most part under special licence) for February over January is about 800%. The relative values for the three years are tabulated below, and show a distinct increase this year over 1918. As regards exports, the main tendency is to increase, as the value for February, 1919, is nearly three times that of the previous month, and shows an approximate increase of 50% over the figure for February last year. Progress is evidently in the right direction, and as many firms are rapidly getting into their stride we may expect continuous big increases throughout the year, dependent a great deal on the growth of home demand.

IMPORTS.

		1917	1918	1919
Motor	Cycles	..	£15,264	£10
Parts	..	..	£13,514	£5,663
Total		£28,778	£5,673	£9,799

EXPORTS.

		1917	1918	1919
Motor	Cycles	..	£89,932	£47,088
Parts	..	..	£55,340	£38,065
Total		£145,272	£85,153	£114,266



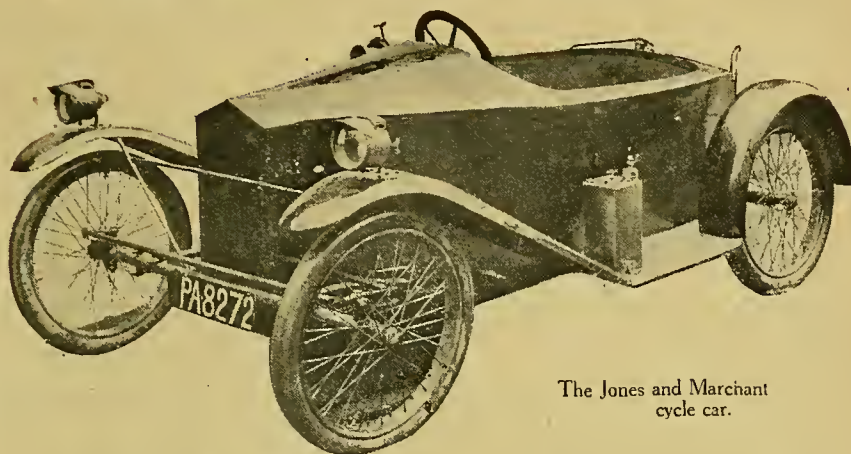
Gear control side of the A.B.C. The integral engine-gear unit is completely guarded from mud by permanent shields of ample size. (For description see pages 242 to 244.)

A NEW FOUR-WHEELED RUNABOUT.

Enclosed Chain-cum-belt
Transmission—Variable
Pulley—Seat-starter.

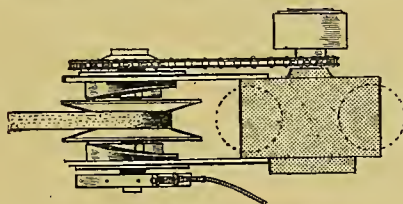
IT is evident that there are many new and ingenious cycle cars coming to the front at the present time. One of these, here described, has been built by Messrs. Jones and Marchant, of 1, Baker Street, Weybridge. It is not yet on the market, but its designers and builders are open to receive offers for its manufacture from any firms capable of taking it up.

It possesses several notable features, including a rack and pinion starter, and a modified form of expanding pulley gear. The motive power is a 6-h.p. J.A.P. engine; the frame is of ash, and is suspended on four quarter elliptic springs. The drive is by chain to the countershaft, and thence to the rear axle by belt. On the countershaft is an expanding pulley actuated by two large face-cams, the shaft being mounted eccentrically on discs to which the cams are attached.



The Jones and Marchant cycle car.

By movement of the change-speed lever, the discs are rotated and the cams press against the sides of the pulley. This presses them inwards, thus raising the gear, the belt line remaining unaltered. Drawing the lever back enables the belt itself to expand the pulley, and so give a lower gear. Naturally the distance between the rear belt rim varies, but while an equal tension is preserved on the belt the tension on the driving chain is altered.



Expanding pulley mechanism.

To get over this difficulty an idler sprocket has been conveniently mounted on part of the mechanism, and is so arranged that it takes up the slackness in the chain as the gear lever is pushed forward. There is also a plate clutch carried on the engine shaft.

Other Details.

One of the accompanying illustrations gives a diagrammatic view of the gear, the idler sprocket, and also the rack and pinion kick starter which works admirably.

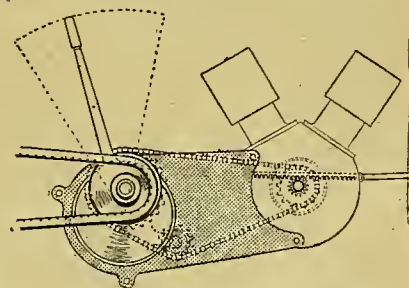
It will be seen from the semi-bird's-eye view of the vehicle that the engine and transmission are entirely enclosed. This view also shows the hammock seats, the petrol tank at the rear, and the handle for the rack and pinion starter.

The back axle is solid, no differential being fitted. The steering is ingenious, as the worm is carried inside the steering column and is adjustable.

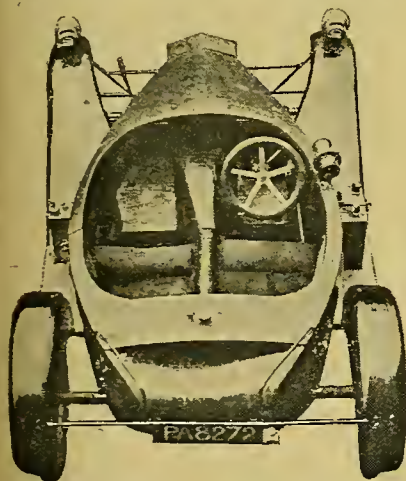
It will also be noticed that there is a hand brake on the countershaft, while the rear brake is applied on to the V of the pulley, which is situated on the rear axle.

The car has proved itself to be excellently sprung, to have a good turn of speed, and, we are told, to be capable of climbing practically any hill.

Provided the belt and pulleys are of good size, there appears to be no reason why a reasonable measure of success may not be obtained.



Diagrammatic view of the gear.



Plan view of the cycle car, showing its boat-like outlines

ROAD CONTROL.

IN reply to the opposition and criticism being raised in the House of Commons to the new Transport Bill by members who consider that the development of roads will be prejudiced if they are placed under an authority influenced by railway interests, the Government reply is said to be to the effect that the control of roads will be a distinct branch of the Ministry, and no official partial to railways will intervene between it and the Minister. This "reply" has appeared in the daily press, and no reference is made to the fact that one of the chief objections to the proposed appointment of Sir Eric Geddes,

late manager of the North Eastern Railway, as the Minister of Ways and Communications.

"If a district needs opening up," runs a newspaper report, "this Minister will consult his different overseers and determine whether light railways, tramcars, or motor vehicle service is best. Having powers to run any of them, he may, for instance, say that motor omnibuses shall be put on a certain rural route, part of the necessary improvement of the roads being borne by the State, and if the subsequent traffic justifies it, he may institute a light railway. Such im-

partial decisions in the merits of each case would be impossible if roads and railways were under separate control."

Once more we would remind our readers of the fate of the canals after they came under the influence of railway interests. The opposition to the proposed Bill is not entirely confined to motoring interests, in which connection Mr. Bonar Law stated in the House last week that, in view of the many representations he had received, he had decided to postpone the taking of the Ways and Communications Bill until next Monday. It is said that Sir Edward Carson may lead the opposition.

CLUB NEWS.

Carlyle (Chelsea) M.C.C.

Mr. I. Lafferty, the secretary, informs us that some confusion apparently exists between the name of this club and that of a West-end institution of the same name. The name "Carlyle" is associated with the parish of Chelsea, and was adopted by this club in 1903.

Finsbury Park C. and M.C.

The opening meeting will take place on March 15th, when tea will be served at 5.30 p.m., followed by a lantern exhibition of club interest. Members and prospective members intending to be present are requested to notify the hon. secretary, Mr. J. Evans, 33, Springdale Road, N.16, whether they require a place reserved for tea or for the entertainment. The venue is the Red Lion Hotel, Barnet.

York and District M.C.

At the annual dinner and general meeting held on the 26th ult., the officials were elected and great enthusiasm manifested by members of the club. The opening run has been fixed for April 9th, to Farndale. Mr. C. S. Russell offered a gold medal or cup to be won by a non-trade member of either sex, who gains the highest number of marks during the year. Marks are allotted at the rate of one for attendance, one for punctuality, and one for cleanliness of machine. The hon. secretary is Mr. G. A. Reed, 6, Blake Street, York.

Future Events.

- Mar. 16.—N.M.C.F.U., Sheffield. Run to Blythe.
 Mar. 16.—N.M.C.F.U., Birmingham. Opening Run to Stonebridge.
 Mar. 23.—N.M.C.F.U., Sheffield. Run to Castleton.
 Mar. 30.—N.M.C.F.U., Sheffield. Run to Matlock.
 April 5.—Birmingham M.C.C. Opening Run.
 April 6.—The M.C.C. Opening Run to Hatfield.
 April 6.—Woolwich, Plumstead M.C. Non-stop Trial from Knockholt to Lamberhurst and Back.
 April 9.—York and District M.C. Opening Run to Farndale.
 April 13.—Liverpool M.C.C. Opening Run.
 April 18.—Darlington B and M.C. Opening Run.
 April 21.—Birmingham M.C.C. Easter Trials.
 April 21.—Dublin M.C.C. Dunlop Cup Trial.
 May 4.—N.M.C.F.U., Sheffield. Reliability Run to Knutsford.
 June 9.—Dublin M.C.C. Whit-Monday Trial.
 June (end of).—Dublin M.C.C. Twenty-four Hours' Reliability Trial.
 Aug. 2 and 4.—Dublin M.C.C. Trial.

Rochester, Chatham, and District M.C.C.

It is intended to hold a meeting, with the purpose of reforming this club, early in April. The hon. secretary is Surgeon Lt. S. White, R.N.V.R., 3, South Avenue, Rochester.

Club for Ryton and Blaydon (Durham).

It is proposed to form a club in the Ryton and Blaydon districts, and a meeting is to be held shortly with this object in view. The secretary *pro tem.* is Mr. A. Forster, 11, Ivy Avenue, Ryton-on-Tyne.

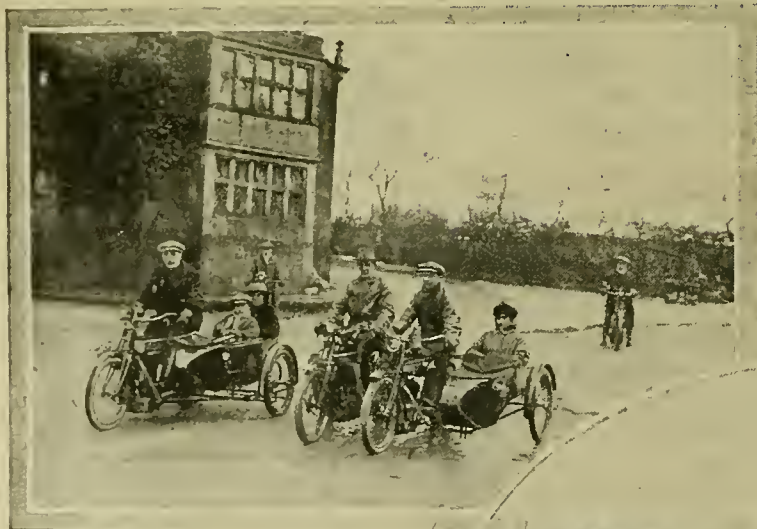
N.M.C.F.U. (Birmingham).

A run to Stonebridge has been fixed for the 16th inst., starting from the Swan Hotel, Yardley, at 11 a.m. On arrival at Stonebridge, the quarterly general meeting will be held, and the hon. secretary will give the General Council meeting report. The Summer Outings and Competitions Sub-committee will state its programme.

N.M.C.F.U. (Sheffield).

Additional runs to those already advertised have been arranged for March 23rd and 30th to Castleton and Matlock respectively. A reliability trial has been fixed for May 4th to Knutsford. Solo machines to average 20 m.p.h., and passenger machines 18 m.p.h. Mr. L. B. Henderson, A.M.I.A.E., has given a gold medal for the winner, and second and third prizes will be awarded. An additional prize for the best performance of lightweights will be given. The secretary is Mr. W. Wright, 48, Hinde Street, Firth Park, Sheffield.

We shall be pleased to hear again from secretaries and others regarding existing and proposed clubs, their programmes, and any other interesting particulars. We are prepared to assist with advice and publicity those desirous of establishing clubs.



In last week's issue we illustrated a motor cyclist's picnic party in the open during the first week-end of March. Sheffield riders, however, were not favoured with such mild weather. The riders depicted are members of the Sheffield N.M.C.F.U., who have learned that the motor cycle is not a machine for summer only.



The Eternal Question—What shall we Wear?

Further Notes on Attire for Feminine Motor Cyclists.

MISS GARDENER'S article on the question of clothing, which was published in our issue for February 6th, has evoked considerable interest among our lady readers. The number of letters we have received on this subject indicates that the motor cycle no longer is regarded by the fair sex simply as a vehicle of pleasure, and that many ladies are now using their machines throughout the year. This being so, the question of appropriate clothing is of greater importance to them than to those who merely ride for pleasure, as the latter, as a rule, are not all-weather motor cyclists.

The short contributions given below, from other lady motor cyclists, are selected from correspondence received since the article appeared.

Mrs. E. G. Cochrane, whose photograph we reproduce on this page, writes as follows:

"I was greatly interested in your article 'What shall we Wear?' by Miss E. M. Gardener, and, for the benefit of other lady motor cyclists, give my experiences with regard to the vexed question of clothing.

"For ordinary weather I wear a sporting Norfolk jacket, fitted with a fur collar, which is very serviceable when turned up for riding at night.

"After trying all sorts of queer outfits, in the hope that I might find something efficient, I have come to the conclusion that there is nothing to beat Bedford cord riding breeches for good hard wear, appearance, and comfort. Puttees are certainly clumsy and difficult, nay, almost impossible, for a lady to put on properly, and so I have discarded them, substituting instead a pair of warm cycling stockings, worn over ordinary thick ones. In wet weather I wear a long mackintosh waterproof overall over the Norfolk coat, and also top boots, which seem rather heavy, but are really necessary. For ordinary weather I find thick golf shoes sufficient.

"My cap is made after the fashion of the R.A.F. lady-drivers hat, and is kept in position by pressure from the goggles. A pair of fur-lined gauntlet gloves completes the costume for riding; these latter I have found absolutely essential. One gets chilled to the bone through wind rushing up one's sleeves when wearing ordinary gloves.

"I always carry with me a short skirt, buttoning up in front and at the back, which I slip on for walking on arrival at my destination. The whole costume, with the exception of the breeches and overall, is made of shower-proof material, and is sufficient to keep out ordinary rain, it being only necessary to wear the waterproof during a really heavy downpour.

"I have used this costume on all occasions for a couple of years, and it gives every satisfaction. During very cold weather, I wear underneath the costume, in addition to ordinary clothing, a Cardigan jacket, and also a woollen scarf."

A second letter is from a lady who gave up motor cycling on account of the difficulties of dressing neatly:

"Although Miss Gardener seems to have gone a long way to solve the problem of 'What shall we Wear?' there is still room for some hard-thinking tailor to introduce a



A serviceable costume worn by Mrs. E. G. Cochrane. The skirt can be quickly removed for riding.

costume that shall be complete in itself, and not an adaptation of various garments in which one is ashamed to be seen with or without one's machine.

"I gave up motor cycling for this very reason. I rode only in the summer, but, notwithstanding, I shrank from the attention I attracted when off the saddle. For the present, I am content to be a sidecar passenger until (1) a suitable costume is offered to lady motor cyclists, and (2) a motor cycle is designed that shall protect the rider from mud. With the help of *The Motor Cycle*, both these things will eventuate."

"M.D.," a Surrey school girl, gives her experiences in the following entertaining letter:

"I was very interested in the article in your pages on 'What shall we Wear?' I

have found this a difficult problem, and have not really solved it. Being a somewhat youthful rider (I got my machine for my fourteenth birthday two years ago), I do not, of course, wear terribly long skirts.

"I use the bicycle to convey me to the station every morning, as I go to school by train, so, of course, I have to wear my ordinary school clothes and cannot—like Miss Gardener—wear breeches, etc.

"I find it quite easy to ride in a skirt, and see no reason why any lady should not, unless, of course, she wears a narrow one. When I leave home, I generally wear a tweed costume, school regulation navy blue felt hat, a tweed overcoat, and over this an old showerproof coat—very oily and muddy—which I discard at the station.

"I had difficulty with footwear, however, as I could not arrive in town (where the streets were almost dry) splashed up to my knees in mud, but this was solved by a friend, who kindly gave me a pair of field boots, which I change at the station.

"Like Miss Gardener, I also experience difficulty with headgear, and generally arrive at the station with my hat clenched between my teeth (I am afraid this accounts for the colds I get, especially in wet weather). Behold me, then, a flying female figure, hat between teeth (it's nasty when the dye runs), a khaki coat, and trench boots, hastening to the station at the last possible minute. I run the bicycle into the shed and emerge with navy blue hat, costume, and spotlessly clean shoes (I carry my shoes tied to the belt of my coat).

"I wish somebody would send a few suggestions for one who has to arrive at school respectably clad, and as if she had never seen a motor bicycle or muddy road in her life.

"At first I found I was always getting my coat caught in the kick starter, but have solved that by having the offending mechanism removed. I was taught to take a running start—the clutch would not work, so the starter was never of much service.

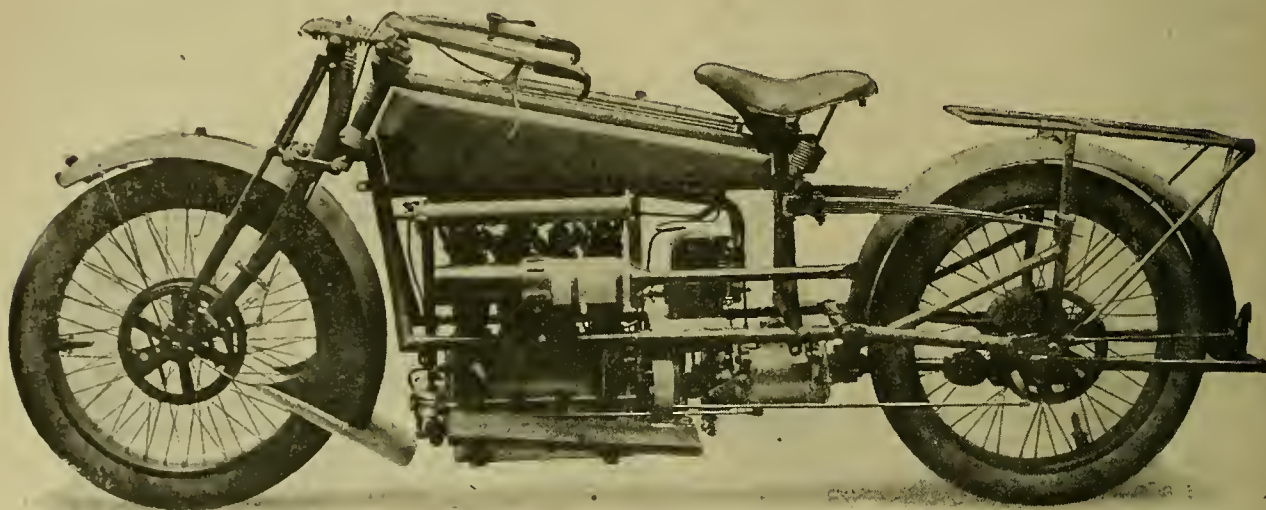
"I should be so glad if any reader could give me any advice on this subject of dress, as it will be seen from the above I must look like nothing on earth.

"About gloves, thanks to an airman, I find that silk gloves worn inside gauntlets are the best."

Doubtless there are many other members of the fair sex who have had some experience in these matters of which they would not object to give others the benefit. Particularly must this be the case among members and ex-members of the Forces who have had much riding to do in all kinds of weather.

A Four-cylinder Mount built by its Designer.

An Engine with Overhead Valves, Camshafts, and Other Unique Features.



The four-cylinder motor cycle is rapidly growing in favour. As a high-powered machine for all purposes it is eminently suitable. We give below particulars of a machine built to the designer's own ideals, many of which will doubtless find echo in the mind of the enthusiastic amateur. Incidentally, it is not proposed to put this machine on the market.

WE recently had the pleasure of inspecting a machine of promising design, built by Mr. R. G. Baird, Nottingham, solely for his own use. This machine embodies, among other features, a four-cylinder engine of 750 c.c. capacity with overhead camshafts. Nothing has been scamped, and every detail most carefully thought out, and equally well executed.

The frame is of substantial design, with extra heavy Brampton Biflex spring forks and quarter-elliptic leaf springing at the rear. As will be seen from the illustration, the rear springing is very neat, the springs being bolted to a bracket below the saddle, the thin ends of the springs sliding between rollers secured to the triangular support which carries the rear spindle. The pivoting spindle is of specially stout dimensions, and supplied with a lubricator feeding the oil into grooves. The construction should be capable of resisting a great deal of side stress—the weak point of many spring frame machines.

General Design.

A duplex tubular cradle carries the engine, and the whole can be dropped out of the frame by undoing four bolts. The only weak point of this construction appears to be in the use of right-angled and T lugs, which take the weight of the engine. The straight top tube slopes up to the steering head, which is of ample size to take upper and lower Timken taper roller bearings on which the steering fork works.

A neat-looking tank is used for petrol only, and will hold two and three-quarter gallons. Attached to the off side of it is the change speed quadrant, as

shown. The mudguards are exceptionally wide, and the front one is provided with a valance. The rear guard is secured to the heavy gauge carrier, and moves up and down with the wheel, maintaining 1½ in. clearance. The wheels are con-

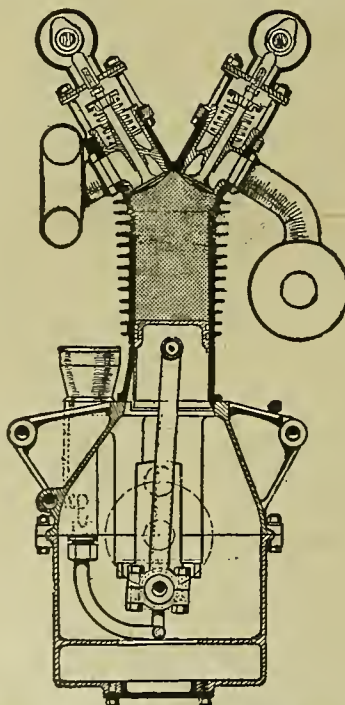
structed with voiturette rims to take 700×85 mm. tyres. The wheel hubs run on Skefko ball bearings, and the rear wheel, in addition, has a double-thrust ball bearing. Adequate lubrication of these parts is ensured by the provision of large grease caps on the hubs, the grease serving largely to exclude mud. 9 in. brake drums for the internal expanding brakes are attached to the spokes, the rear brake being worked by pedal and the front by a Bowden control. The wheelbase is 63 in., the ground clearance 3½ in., and the saddle height 32 in. when the machine is unloaded.

There are many features in the engine construction worthy of note, and no pains have been spared to make the transmission silent, efficient, and lasting.

The Engine.

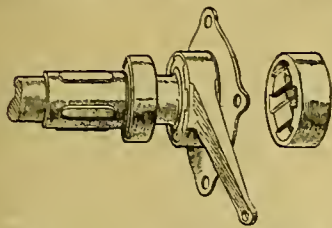
The cylinders are of 55 and 80 mm. bore and stroke respectively, giving a total capacity of 760 c.c. The lower end of each is spigoted into the crank case, and held down by four studs in the usual manner. Two openings at 60° are provided in the combustion head to receive the valve cages. Another hole is tapped to take the sparking plug, also at an angle. Lugs are provided at the tops of the cylinders for attachment of the camshaft case supporting bolts.

Special high tensile nickel-chrome steel is used for the valves, which have a split cone spring-plate retaining arrangement approximating to aero engine practice. The effective valve diameter is 25 mm., and the lift 8 mm. Width of the seat is 2 mm. at an angle of 30°. The stem is 7.14 mm. thick, and undercut to take the cone cotter. The valve cage is made of cast iron, with ports in the sides to



Section of the engine, showing the method of operating the valves.

A Four-cylinder Mount built by its Designer.—



The extremely neat clutch withdrawal mechanism operating through helices.

correspond with the inlets or exhaust pipe outlets as the case may be; the whole is retained by a gastight sleeve nut. The valves are operated by two overhead camshafts, which are driven by spiral gears from the half-time shaft. This construction disposes of the necessity for rockers and pivots, the cams acting directly on square-section adjustable tappets, which in turn bear on the valve stems.

The valve timing is as follows: Inlet valve opens 10° late and closes 45° late; exhaust valve opens 46° early and closes 6° late.

Each camshaft is an alloy steel rod, on which are tightly fitted the separate cams, which are pinned through and separated by tubular distance pieces. The shafts are hollow, running on ball bearings, and forming ducts, into which oil is pumped by the main gear-type oil pump, the oil escaping through small holes drilled from the cam faces through to the duct. The surplus oil flows into the camshaft case and returns to the sump by way of spiral grooves cut in the vertical shafts, which, while rotating, have a slight pumping effect. The flow of oil into the camshaft can be regulated by a threaded piece on the end of the casing where the oil pipe is connected.

Forced Lubrication.

The pistons are of "point five" carbon steel turned from the bar, with flat heads and only two rings. No strengthening ribs were considered necessary, and the weight consequently was kept low.

Tubular connecting rods are used, and serve as oil ducts to the gudgeon pins, which have phosphor-bronze bearings, the big end bearings being of white metal without the usual brass shell.

A substantial five-bearing crankshaft is employed, drilled throughout for forced lubrication to all bearings. The main bearings are plain white metal in aluminium housings attached to the upper half of the crank case in car engine fashion. A flange is turned on the rear end, which is drilled and tapped to take the shanks of the countersunk set pins, which hold the flywheel to the crankshaft. No balance weights are fitted to the crank webs. The oil is fed to the crankshaft bearings from a pipe with branches to each of the main bearings. In order to obtain the offset or *désaxé* effect, the shaft is set 10 mm. off centre, i.e., one-eighth the stroke to one side.

The crank case follows car practice, in that it is divided horizontally, but there is no tray for splash lubrication, and a deep sump is provided below the big ends, in which the whole oil supply, amounting

to three-quarters of a gallon, is stored. One wall of the upper half of the case embodies the oil lead to the main bearings, and baffles cover the cylinder openings, just leaving room for the connecting rods to oscillate. A large sized combined oiler and breather is provided with a special oil retaining cap. Attached to the forward end of the lower half of the crank case is the gear-type oil pump, leading from which are the two supply pipes to the crankshaft and camshaft respectively.

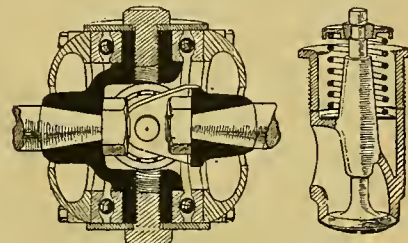
Bolted to a plate over the gear box is the magneto, which is driven by enclosed roller chain from the off side camshaft, and attention to detail is shown by the fact that the shaft spindle on the chain cover carrying the half coupling is on ball bearings so that no strain is put on the magneto shaft bearings. As the magneto is of a type that is liable to lose magnetism through its shaft, half the coupling is made of brass. The coupling consists of two discs, one with sixteen and the other with seventeen holes to take the coupling bolts, so that very fine ignition timing adjustments can be made.

The Plate Clutch.

A Claudel-Hobson carburetter is used, and the induction pipe takes the form of a double O to prevent surging and rebound of the gases at high speeds.

The flywheel is turned from the solid, and incorporates a Ferodo-lined flat plate clutch. The plate has a central boss, which is broached to slide on four keys arranged around the mainshaft, and six helical springs hold a circular plate member (faced with a ring of Ferodo fabric) against it, and so press it against a further fabric ring attached to a circular cover plate on the other side. The clutch release mechanism consists of six levers pivoted on bosses attached to the cover plate, provided with adjusting screws, which bear on studs through the inner lined plate. The operating mechanism is attached to the forward end of

the gear box, and works through a four-start quick-thread in a boss on the lever end. The pressure is taken by ball thrust bearings, so that a minimum of effort is required to withdraw the clutch. The whole assembly (minus flywheel) only weighs $3\frac{1}{4}$ lb. The gear box is a three-speed, six-wheel type, sliding gear arrangement, operated through forks which move along rods inside the box. As the shaft drive has to be taken to

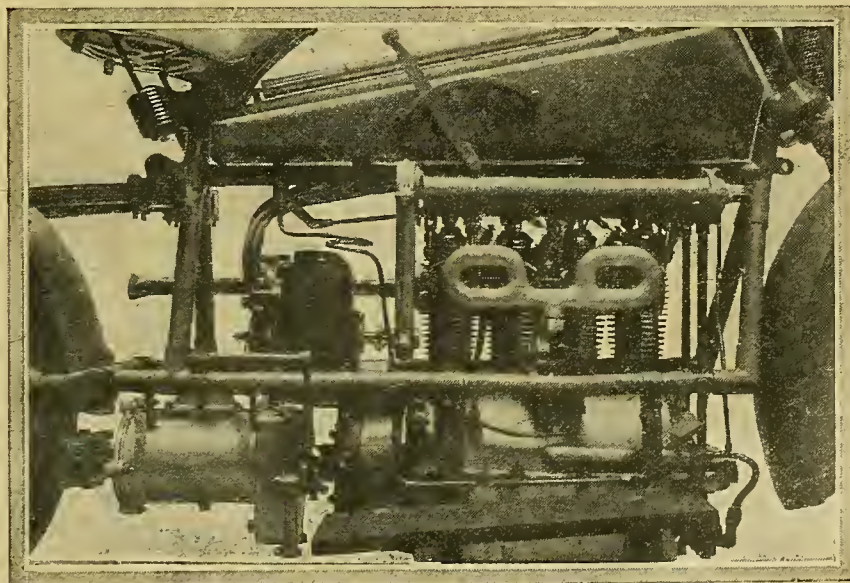


(Left) The substantial construction of the rear ball bearing universal joint is shown by this section.

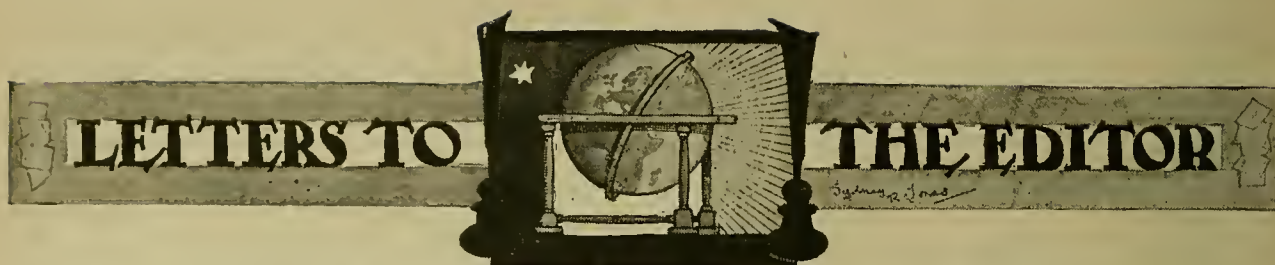
(Right) The easily detachable valve and cage assembly which facilitates inspection of the valves.

one side, the direct drive is through the secondary-shaft, with equal-sized gears, the reduction of 4.6 to 1 being obtained through the worm gearing. Both shafts are on ball bearings, with washers and pads to prevent oil leakage. The other two ratios are 6.44 to 1 and 11.6 to 1. This unit weighs $22\frac{1}{2}$ lb.

Immediately behind is the sliding universal joint, and another joint connects the cardan-shaft to the worm gear, which consists of a four-start straight type steel worm, polished on the thread and supported on ball bearings each side, and having thrust bearings to take the end pressure. The worm wheel is of phosphor-bronze, and the whole is enclosed in an oiltight casing. The side thrust due to the worm is taken in the rear wheel by double thrust ball races.



Induction side of the Baird four-cylinder power unit.



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Herford Street, Coventry, and must be accompanied by the writer's name and address.

MOTOR CYCLES FOR THE MAIMED.

Sir,—In reply to Devereuse H. Whyte's enquiry, the 3½ h.p. Sunbeam has no right foot controls. All controls, including clutch, are on the handle-bar, and the foot brake is operated by the left foot. WALTER D. MALLET.

THE THREE-JET BINKS CARBURETTER

Sir,—With reference to the discussion in your paper upon the "dead spot" in the Binks three-jet carburetter, I should like to state that I found a remedy for this by slightly chamfering the upper edge of the air-hole for the second jet on the side nearer to the engine.

The "dead spot" was only between the first and second jets, the opening on to the main jet being perfectly smooth.

Hoping this may assist other users of this fine instrument, Sheerness. H.C.

THE MOTOR CYCLISTS' PARLIAMENT.

Sir,—Such a spirited appeal as Maj. Axford's should surely arouse the rank and file of motor cyclists to take an interest in the A.C.U. and their own welfare.

There certainly is a vagueness in the minds of many motor cyclists as to the vocation of the A.C.U., but surely it is clear to every thinking motor cyclist that a body really representative of his fraternity and working for its best interests is vitally necessary. Organisation is essential in these times; the last four years have demonstrated that, however worthy a purpose, unity of action is vital to its accomplishment. There will undoubtedly be an aftermath of the war in the form of legislative restriction, road problems, and similar handicaps to motor cycling. As there is obviously no possibility of the motor cyclist overcoming these in his individual capacity, one would think that the average rider would be concerned enough to find out what the A.C.U. is, and then accord it his support.

The details of the constitution of the A.C.U. quoted by your contributor should convince motor cyclists that the management of the Union is established on about as sound lines as it could be.

Major Axford's remarks regarding committee nominations are particularly interesting. The fact that the management and financial control of the A.C.U. is vested solely in the committee makes the question as to who shall serve thereon one of vital importance. The committee, indeed, practically constitutes the motor cyclists' parliament, and as such its *personnel* is a matter of concern to every rider. One can hardly exaggerate the desirability of having a committee of real motor cyclists of fighting temperament.

There is no lack of thoroughly practical and representative motor cyclists at the present day. As a body no section of the people did better service in the war than motor cyclists. Among those who bore a strenuous part in the conflict, in khaki or out of it, are many who have learnt the requirements of motor cyclists from A to Z; and their experiences with motor cycles under all conditions qualify them to speak and act for the best interests of the fraternity. It is men of this type whom we want on the A.C.U. committee—experienced, clear-headed, aggressive counsellors, who will give qualified, consistent, and disinterested service for the safeguarding and advancement of motor cycling interests.

The trouble is, I am afraid, that the average clubman has not the qualification for determining who is really a representative man to send to the A.C.U. committee. The danger Major Axford speaks of regarding the man whose only qualification is a genial personality is very prevalent in this connection. Geniality is a most acceptable charac-

teristic in these days, but it is quite a mistake for local clubmen to nominate a representative to the A.C.U. just because he is a good fellow.

We all hope after the stress of the past few years for an era of motor cycling that will in some degree compensate for our endurance. But everything will not be plain sailing in the immediate future, and it certainly behoves every animated motor cyclist to find out what the A.C.U. is doing, to give it what support he can, and to use any influence he may possess to ensure that right men constitute its committee—the motor cyclists' parliament.

OSCAR C. SEYD.

THE A.C.U. COMMITTEE.

Sir,—Maj. Axford's article in the last issue of *The Motor Cycle* was extremely interesting, but I imagine the club—and individual members, too—are still in the dark as regards the names of the "fighters" they should nominate for election.

My knowledge of the men who have controlled the policy of the A.C.U. in the past, and my faith in the future of the Union, leads me to suggest certain names as those of men likely to help forward actively the fighting programme that we must get the Union to carry out. In the past, certain men have represented both the club and the private members, which means that they have robbed one or the other of their allotted representation. I have not been able to complete my list of club nominees, but so long as the club do not, when filling up the gaps, nominate the candidates I have suggested as representing the private members on the R.A.C. this mistake can be avoided.

Suggested Club Nominations.	Suggested Candidates to represent Individual Members.	Suggested R.A.C. Nominees.
H. Boocock	Sidney Axford	E. M. P. Boileau
H. G. Bell	S. L. Bailey	Col. Brereton
W. Cooper	J. W. G. Brooker	Lt.-Col. Davidson
A. V. Ebbelwhite	G. Stanley Carter	— Gregory
C. J. Feeny	T. W. Grice	Rev. E. P. Greenhill
H. Johnson	W. H. Graham	H. P. E. Harding
B. Mariani	D. W. Morgan	Col. Lindsay Lloyd
Lionel Martin	Vivian Olsson	Dr. Löw
W. Southcomb May	Maj. Potter	W. G. McMinnies
F. Murray	C. L. Scott	J. R. Nisbet
A. G. Reynolds	Otto Thomas	E. S. Shrapnell-Smith
J. Simmonds	One more	A. W. Torkington
W. H. Wells		
L. Wozencroft		
Duncan Watson		
Five more		

E. B. WARE.

[It will be generally agreed that only energetic workers be nominated on the A.C.U. committees. Mr. Ware's lists contain the names of many such enthusiasts, in every way qualified to represent riders in the motor cyclists' parliament; but if we may offer comment, the addition of a stronger representation from the provinces (Birmingham, Manchester, Sheffield, Bristol, North of England, etc.) is necessary. In the past too many provincial motor cyclists have regarded the A.C.U. more or less as a London institution—an impression which that body must remove entirely if the support of the majority of motor cyclists is to be secured. We fear that Mr. Ware's suggested representatives, if elected, would not entirely remove that impression.—ED.]

TO KEEP THE HANDS WARM.

Sir,—My riding has been like that of your correspondent, Miss Gardener, in that at certain times I have had a journey to do, no matter what the weather, and although the ride has not been for many miles during the war, and never for joy-rides, I have suffered much from cold hands until this winter. I had presented to me a pair of gloves made of kid, the outside of the fingers and backs of the hands covered with lamb skin with the wool on. There is a good gauntlet over the sleeve. When the handles of the machine are grasped, only the wool is exposed to the weather. I had a drive recently in 20° of frost, yet my hands were quite warm. A soldier on leave carefully examined my gloves, and he has "bnilt" a pair. He had some thick kid gloves as foundation, and two dressed hare skins. He has covered them on the backs and made some gauntlets. They are as good as mine for warmth and keeping out the rain and snow. Personally, I consider them ideal.

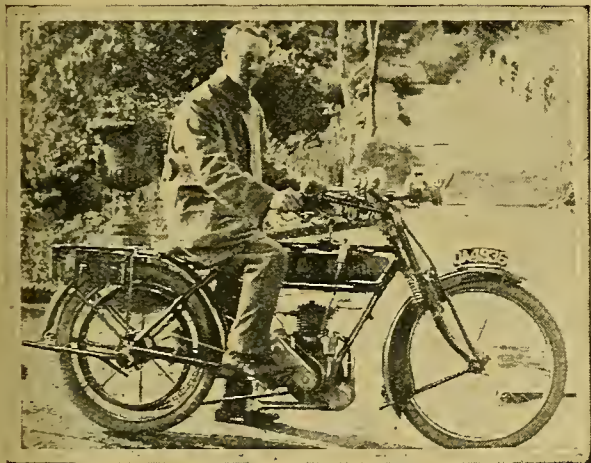
W. J. BELDERSON.

ADVANTAGES OF A TWO-STROKE.

Sir,—As a constant reader of your interesting paper, may I say that I was amazed by Mr. F. W. Varney's statements in your issue of February 6th re his 2½ h.p. Levis? While readily admitting that the Levis is an exceptionally powerful machine, I must say that I think Mr. Varney must have his tongue in his cheek, when he states that his machine is capable of taking three passengers in a coach-built sidecar up the "dreaded hills," Sir William, Mam Tor, etc. Surely if these statements were justified fully by performance, Messrs. Butterfields would announce them in their advertisements? May I add that I should be interested to hear more from Mr. Varney about this truly remarkable machine?

C. W. ORFORD.

Sir,—Having only recently landed in England from Macedonia, and not having had the pleasure of seeing *The Motor Cycle* lately, I have missed your correspondent's (Mr. Varney's) remarks about his admirable 2½ h.p. Levis. It must be a wonderful machine if it can do all that is reported in the letters of other correspondents in the issue for February 20th.



Mr. A. A. Smith and his Regal two-stroke.

In reply to "Enquirer," I have pleasure in telling him that he need have no anxiety about the power of a 2½ h.p. two-stroke engine for sidecar work; and as a satisfied owner of a Regal-Peco combination, plus a Sturmey-Archer three-speed hub, I have yet to meet the hill I cannot climb with at least two passengers. I have driven from Birmingham to the Isle of Wight and back with three up (about 28 stone), and averaged fifty miles to the gallon on that tour, which speaks well for economy. I average 80 m.p.g. solo.

I can safely say the Peco is a no-trouble engine, and after 5,000 miles it shows no sign of wear or loss of power—no doubt due to the excellent oiling system (drip feed) employed.

I would urge "Enquirer" to see to it that he gets a full 2½ h.p. unit, i.e., 75×79 mm. bore and stroke, 349 c.c., and be satisfied with *nothing less*. Not being a speed merchant, he will, I feel sure, be well content, although, riding solo, he could obtain anything up to 40 m.p.h., should the fit take him. Most of my riding has been with sidecar and passenger.

I have pleasure in enclosing a photograph of myself and trusty friend.

A. A. SMITH.

IS A T.T. RACE POSSIBLE?

Sir,—Surely, seeing that the Isle of Man people are anxious to have races in the Island this year, a motor bicycle race at any rate can be held, provided the A.C.U. or other suitable body will undertake the organisation.

The fact that the trade is unable to participate is no reason why the race should not be held. I am quite certain that if you asked in your paper for the names of amateurs willing to enter, provided the entrance fee did not exceed, say, £5, you would get a large number.

If Senior and Junior races were arranged on the lines of the 1914 races, I imagine you would easily get one hundred or more entries, and a sufficient sum would thus be raised to enable the races to pay expenses, and very probably a little bit over.

Of course, with no trade support the races would have to be run on a far less elaborate scale than in 1914, but, provided the safety of competitors and public is assured by necessary barriers and flagging, etc., we should have to get along without elaborate stands, filling-up depots, etc.

As regards machines, there will by June or thereabouts be a fairly wide choice of both 500 c.c. and 350 c.c. makes available; makers' standard or amateur faking only permitted.

Without the crack trade riders and tuners and factory assistance, average speeds would be a little below 1914, but a good sporting race should result.

From a racing point of view the course was always rough, and if it is a little rougher still this year I fail to see that it matters. All the better test for man and bicycle.

There are plenty of sportsmen in Britain, both would-be riders and spectators, so why not test the possibilities at any rate a little later on when more of the boys are back?

VIVIAN OLSSON.

REAR LIGHTS ON CYCLES.

Sir,—Signatures to a petition against the compulsory rear lighting of cycles are being canvassed for in this district (Stafford), where many hundreds of cycles are in daily use.

On questioning two or three of the more responsible signatories they gave me as their reason for signing this petition that they "find the rear light a nuisance to fiddle with and keep alight; that's all."

Do these people realise how often the little red glow has saved a life, to say nothing about the comfort it has given to the drivers of fast moving traffic? If so, what can they care for the safety and comfort of the majority of road users?

This red light has shown out of the gloom ahead when vision has been temporarily "blurred" by on-coming head lights, and has prevented on many occasions a smash on overtaking a cycle user. This is a real danger; how very real can only be judged by a motorist.

I cycle daily (being three miles away from my business), and, whatever the law may be, none of the five cycles in my household will be used after dark without a rear light, as my greatest "shocks" on the road have been caused by rear lightless cycles.

If successful, these petitioners would force on to the road thousands of glaring seachlights—the motorist's safeguard—a nuisance in traffic as much to those who would thus be compelled to use them as to the general public, particularly cyclists; and, of course, other slow moving traffic would follow up with more petitions.

Where, sir, should we eventually retrograde to?

I maintain the conditions of war did none other than accentuate the necessity for the law as to rear lights, and it would be a homicidal Act which would repeal it.

I have been a cyclist for thirty-five years, a motor cyclist (about 17,000 miles) for eight years (without accident), and a special constable for over four years, so I think my experience and opinion are not unworthy of record.

Please peg away for sound judgment to prevail in this matter.

W. J. SHEPHERD.

RUSTLESS STEEL FOR MOTOR CYCLES.

Sir,—Referring to Mr. Walford's letter in your issue of Feb. 20th, may I point out that the comparison drawn by him between Stainless steel and B.N.D. is somewhat analogous to the expression of an opinion that a piece of coal is larger than a brown paper parcel. Both these steels can, in one condition of heat treatment, give lower tensile strengths than 40 tons, if desired, just as they can both be treated to give over 90 tons tensile.

After all, however, other factors are of more importance than maximum stress, from the motor manufacturers' point of view, and the general mechanical properties of Stainless make it a valuable material for many applications, apart even from those where its freedom from corrosion renders its adoption almost indispensable.

The fact that Stainless steel has very largely replaced tungsten steel in the valves of aero engines, where efficiency alone is the deciding factor, is definite proof of its superiority as a valve steel for high duty internal combustion engines.

THOS. FIRTH AND SONS, LTD.,

R. B. BILLINGHURST.

ELECTRIC LIGHTING BY BATTERIES.

Sir,—In a recent issue of *The Motor Cycle* appears a letter from "Practical Engineer" regarding battery lighting, which I cannot pass unanswered.

"Practical Engineer's" criticisms are not borne out by fact. It may interest him to hear that 4 volt Hellesen dry cells have been used in connection with certain instruments used for war purposes, and although the work put on them has been far greater than a bell circuit would do, they have stood up to this work for more than three years, and then have been used for bell ringing, and, to the best of my knowledge, are still in use.

A few years back I installed a complete set of Messrs. Hunt and Co.'s electric lamps and Hellesen batteries on my motor cycle, using bulbs of the following candle-power: head lamp 3; tail lamp 1.5. My average period of night riding was four to five hours per week, generally using my lamps for about one hour and a half at a stretch. With this use the Hellesen cell lasted nearly fifteen months, and was then put into use for bell ringing and other purposes.

As for "Practical Engineer's" statement that dry batteries are generally used to supply a current measured in milliamperes, I should not care to have my mill-ampère meter placed in most circuits where dry batteries are used.

In conclusion, I can strongly recommend dry batteries for lighting on a motor cycle when the lamps are only used at intermittent times, and for, say, not longer than one hour and a half at a stretch. Then if a bulb consuming about .6 or .8 ampère is used in the head lamp and the smallest lamp obtainable for the voltage (4 or 6 volts), a satisfactory lighting system will be obtained. I have no interest in Messrs. Hunt and Co. C. R. RUSSELL, A.A.I.E.E.

PULLEY GRIP.

Sir,—The article in your issue of Feb. 20th on the new Grado pulley draws my attention to a point that I have often wondered about. You say "The outer flange continuously tends to close in on to the inner flange, thus gripping the belt in whichever position it may be." Does it? You then proceed, "If the controlling mechanism is freed, the pulley will gradually close. . . ." That is the point. It is obvious that the whole pressure generated by the tendency of the flange to move inwards is exerted against the control rod, and not on the belt. Look at it another way: in the case of a pulley with fixed flanges, the pressure at any moment between the belt and the flanges depends on (1) the turning effort of the pulley at the moment and (2) the initial tension of the belt (assuming the usual angles for belt and flanges, 28°, I believe). That is, the pressure of the belt against the pulley equals the pressure of the pulley against the belt. If the latter alone were to increase, the belt would have to rise in the pulley until the balance of pressures was restored again. Therefore, it seems to me that we cannot increase the "grip" (i.e. pressure) of the flange on the belt without causing the belt to rise: this does not happen on the Grado as the flange is prevented from moving by the control rod. The only means of increasing the pressure between the belt on the flanges is to increase the turning effort of the pulley or the initial tension of the belt.

If my reasoning is faulty, perhaps some "high brow" in statics will correct me. I may say I have used a Grado pulley for a considerable period, and I find my theory borne out in practice. If a belt is in good condition it grips when slack on a Grado, but the same belt grips equally well when slack on a fixed pulley. When the belt is hard or glazed (whether leather or rubber), it is the very devil on either pulley. Hoping you can find room for this, and congratulating you on the continued excellence of *The Motor Cycle* (I have read it for twelve years).

GRADUATE.

STEAM MOTOR CYCLES.

Sir,—May I be allowed to trespass on your space to answer the queries of "Slide Valve," Western N.Y., U.S.A.?

My address is St. James, Stratford-on-Avon. I should be very pleased to accept his offer of advice and literature on the subject of steam cars.

"Slide Valve" questions my sanity in placing the engine in the rear of the cycle car. It is not so inaccessible as he imagines. I think he was confused over the word "housing"—"bedding" would have been a better word. The engine could be "bedded" on, not in the rear of the chassis, and be covered with a dustproof bonnet. With the engine at the rear a short chain drive could be employed, as in the Carden cycle car.

Transmission could not be simpler. I should strongly advise those who intend making a steam cycle car to construct the complete chassis, etc., themselves, but purchase the power plant from such factories that make a speciality of small steam units. It does not pay for the average man to experiment in these plants.

Finally, if the steam plant is placed in the rear the safety factor is increased, because a hefty boiler plate could be placed at the back of the driver's seat, so that if anything did go "bust" it would not "bust" the occupants of the car, who would be protected by the boiler plate.

(REV.) T. BAYDEN SINGLETON, B.A.

THE CONTROL OF AEROPLANE ENGINES.

Sir,—I quite agree with Mr. Butt that it is difficult to generalise about aero engines, but this is almost the only accurate statement in his letter.

As to oil pressure building up to excess on the high-pressure system of a cold engine, I will quote from some notes circulated to units in the field by the G.O.C.:

"If the engine is opened out while cold, the pressure set up will be enormous, and will probably cause serious damage. The correct pressure, i.e., for a specified engine, is 45 lb. per square inch: when the engine is cold, the pressure will naturally be much higher."

Mr. Butt has possibly never seen oil systems warmed by conduction during engine stoppages, because his experience has been subsequent to the use of heating devices which obviated this nuisance. Nevertheless, the Allied Governments and contractors issued urgent instructions for this method to be adopted as late as the winter of 1917.

It is true that every engine has its own variations of r.p.m. It is also true that, given a suitable propeller and a properly maintained engine, each engine has a maximum speed, above which it cannot safely be run *continuously*, and a higher maximum which is just safe in a brief spurt. Many engines are wrecked because their pilots regard these specified maxima as mere hot air.

These and other matters were necessarily handled sketchily, owing to limits of space. TORQUE.

BOOKS FOR MOTOR CYCLISTS

MOTOR CYCLES AND HOW TO MANAGE THEM.

The recognised standard text book of the motor cycle: deals with all types of machines and with every part of the machine. 400 illustrations. Price 2/6 net. By post, 2/10.

HINTS AND TIPS FOR MOTOR CYCLISTS.

A valuable collection of useful "wrinkles" and items of information concerning the running, management, and repair of motor cycles. Price 2/- net. By post, 2/3.

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ILIFFE & SONS Ltd., 20, Tudor Street, London, E.C.4
or of leading Booksellers and Railway Bookstalls.

QUESTIONS AND REPLIES

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C.4, and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

Pre-ignition.

? My two-stroke is not running so well as it used to do. It starts away all right, but after a few miles it suddenly stops firing, then, just as the machine is coming to a standstill, the engine fires for a few yards and repeats the performance. The trouble is less pronounced on low gear than on high. I have cleaned the carburetter, jet, and plugs, but can effect no improvement. —A.J.

The trouble is probably due to the plug, and we should recommend you to try changing it. Possibly an improvement might be effected by using a smaller jet. We presume that you have seen that the magneto is in order.

A Worn Tappet Guide

? I have lately purchased a 2½ h.p. Brown motor cycle, and should be glad if you could help me (1.) When the back wheel is turned the exhaust valve tappet makes a clanking noise, and can be rocked from side to side. Is this as it should be? (2.) I had the machine running the other day and volumes of smoke came from the exhaust pipe and the carburetter joint. When the engine was accelerated it gave several jerks before it settled down and slowly accelerated. (3.) When I removed the sparking plug it was sooted up. (4.) I have great difficulty in starting, although there is plenty of petrol reaching the engine. Once the engine is warm, however, it starts easily enough, but takes time to get going. (5.) The machine is fitted with a long exhaust pipe but has no silencer. Is this correct? (6.) What is the age at which a driving licence can be obtained? (7.) Can I get the machine registered for a number without having a licence? —J.M.

(1.) Evidently, the exhaust valve tappet is worn or the bearing needs rebushing. (2.) The difficulty here is too much oil. (3.) The trouble is due to bad petrol. (4.) A long exhaust pipe is satisfactory provided the machine is reasonably quiet. If, however, it is noisy there should be an expansion chamber fitted as close to the exhaust outlet as possible. (5.) Fourteen years of age. (6.) This question is not clear; but if you are asking if you may register a machine for which you hold no registration or no driving licence the answer is in the affirmative, but as soon as the machine is registered you will be asked for a local taxation licence, which must be taken within twenty-one days of your ownership of the machine.

Rocker Spring.

? There is a long spring and a short one on the contact breaker of my magneto, and the short one is broken. I am told it makes no difference. Why should a spring be put on if it is no use? —J.W.

The spring to which you refer merely prevents the contact breaker rocker from coming off its pivot, and does not affect the working electrically.

Loss of Power.

? I have a 1912 Triumph, which ran well until the end of last summer, when it would only run a mile or so, and then gradually lost power and petered out. I had the cylinder reground, new piston, gudgeon pin, rings, and crank case bearings, also connecting rod ends rebushed, and the magneto repaired. Compression is good, carburetter acts well—in fact, everything so far as I can see is in good order, but still the engine has no kick in it. It has always thrown oil about a great deal, especially between the pulley and the crank case, and although supposed to have had new bearings fitted, is just as bad. (1.) What is wrong with the engine? (2.) How can I remedy the slinging about of oil? —G.H.A.

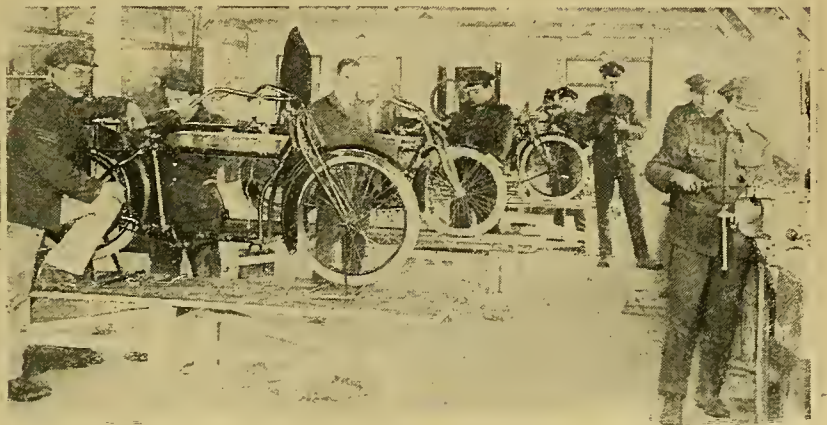
(1.) If you have satisfied yourself that there is a good spark, that the carburetter is working properly, and that there is good compression, there can only be one other solution, and that is that the

timing of either the valves or spark is wrong. We are inclined to think that the pinion on the engine-shaft has worked round and thrown the timing out. You should check the valve timing for this, and afterwards the ignition. (2.) If the rebushing of the bearing is ineffectual in retaining the oil you will have to have a felt washer fitted inside the crank case, but first of all make sure that the crank case air release is quite clear and working properly.

Fuel Mixtures

? (1.) Please tell me if the mixing of one pint of methylated spirits and one gallon of petrol with a two-gallon tin of paraffin, making 3 gallons 1 pint of fuel, would be a suitable mixture for sidcar work. (2.) Will this fuel injure the bearings or cause pre-ignition on a 1914 Indian? (3.) Is methylated spirit suitable for a motor cycle? —A.N.P.

(1.) The mixture, if you leave out the methylated spirits, would be satisfactory, but not so good as petrol or benzole. The machine would probably not start on this mixture, and you would require a hot air intake to be fitted. It might also necessitate the engine being started on pure petrol. (2.) The fuel would not injure the bearings, but would not be so clear running as petrol, would probably cause more carbon deposit, and a greater tendency to knock. (3.) Methylated spirits (or alcohol alone) are not suitable for use in an engine not specially designed for the purpose.




One of the repair shops for British Army motor cycles in Italy. The work of clearing up is gradually being effected on this front, and a few of the workshops have already been dismantled

Sidecar Brake.

? Is it practicable to attach a brake to a sidecar wheel, and what type would be most suitable?—W.H.L.

A sidecar brake is not advisable, unless it can be compensated so as to act together with the machine brake, and this is a difficult proposition. If you have a good front brake of a band or B.S.A. type, that should be sufficient in conjunction with the rear brake. A lever-controlled brake with retaining notches is highly desirable on the heavy outfits.

Protecting the Belt Ends.

? (1.) I have a 5 h.p. twin with sidecar, all belt driven. I recently bought a new lin. belt, and after a sixty-five mile run found that the rubber covering had torn away from the sides at the belt end for a good inch. The belt, of course, had stretched, but was then not over-slack. I may say that the same thing occurred with the old belt, but it had run over 800 miles before it happened. I have only just recently had the engine pulley skimmed up, and it is perfectly true and smooth. The belt pulley is a shade slack, but not excessively (Sturmev-Archer three-speed hub gear), and also runs quite truly. Is there any sort of belt and protector which could be used to prevent this? I thought of cutting out of $\frac{1}{4}$ in. thick rubber a piece shaped  and facing the end of the belt with it. Do you consider this the best thing to prevent the side ends of the belt from tearing away? (2.) When travelling on the level or on a decline, as soon as the speed reaches 30 m.p.h. the engine develops a loud vibratory rattle, and seems as though it was over-running itself, just as if the pistons were unable to keep up to the speed of the machine. The rattle stops as soon as I throttle the engine down to below 30 m.p.h. The rattle does not develop when the machine is pulling up a long steady incline or a hill. The engine otherwise runs splendidly. I obtained sixty-five miles out of one and a quarter gallons of petrol, including several restarts. The engine is free from carbon deposit. There is little side shake in the engine pulley, but I am assured that it is not sufficient to affect the even running of the engine. I may say that there has been rather more than the correct space between the tappets and the valve stems, and I am having the stems lengthened so that I can adjust them correctly. Is it possible for this to be the cause of the trouble?—R.C.T.

(1.) You can get a satisfactory belt end protector from most accessory dealers. Your idea seems to be quite good, but the worst of it is that a 5 h.p. twin is really rather too powerful for belt transmission with a sidecar, chain drive being much better. (2.) What you complain of is an engine "period" due to the particular manner in which the engine is balanced. The difficulty might be overcome by having the balance of the engine altered in accordance with the directions given in our pamphlet on balancing. The tappet adjustment would in no way cause the trouble.

Knocking.

? I am having some trouble with my 1914 $\frac{3}{4}$ h.p. Centaur motor bicycle. It has just been rebushed, and has had new piston rings fitted, but knocks, and will stop on a slight hill when on high gear, and sometimes when changed to high on the level, but when put on low it will rev. again merrily. I shall be grateful if you can tell me the cause of the knocking and loss of power, and the remedy. It will not take hills now which it used to take on high gear with no effort.—A.E.L.

It seems very likely that the knock is due to the new bearings and piston rings being rather a tight fit. Run the engine for about two hundred miles, well within its power, and use plenty of lubricating oil, and if the engine shows any signs of slowing up while running during this distance, stop immediately so as to avoid a seizure. If the engine does not improve, it will have to be taken down and each bearing carefully examined to see if there is any tightness anywhere. Also check the timing in case this may have been altered.

IMPORTANT NOTICE.**GOODS MADE IN GERMANY.**

The proprietors of this journal, being fully in accord with the recommendation agreed upon at the Paris Econom'c Conference, give notice that they will not permit the advertisements of new goods manufactured in enemy countries to appear in this publication

ILIFFE & SONS LTD.

Alteration of Price.

? A few weeks ago I purchased a new machine of a prominent make from the makers' London office. I paid the firm £60, roughly half the cost of the machine, and received a typewritten bill stating the full cost of the machine, with a receipt for £60 attached, as the machine was not ready for delivery. I arranged to pay the balance when it is. Since I purchased the machine the price has been raised, and on enquiry at the office as to how I stood I was told by the manager that I should be required to pay the extra amount, the manager showing me one of the firm's catalogues, in which they stated that they held themselves at liberty to alter their prices at any time. It seems to me that this would only apply to prices in a catalogue, but not to a machine already purchased at a certain price, and on which a deposit had been paid. How do I stand legally as regards the machine?—H.C.D.

Unless it can be shown that you purchased on the conditions in the catalogue, the firm you refer to have no power to increase the price, but must deliver in accordance with the receipt for the amount paid on account. The catalogue may have been brought into the matter in various ways. For instance, there may be a printed intimation on the receipt itself that the purchase is subject to the terms set out in the catalogue, or there

may have been correspondence between you and the firm, and their letters may have shown that they were selling on the terms set out in that catalogue.

Uneven Firing.

? (1.) My machine is a 5-6 h.p. Indian, which I have just had overhauled. After a priming it will start on the stand at the first turn over, and fires quite evenly. But when I try it on the road I have to run with it ever so far before it starts, and then it only fires on the front cylinder till I get going at a good speed, and then the engine fires quite evenly again. (2.) What mileage should I get from a gallon of petrol? (3.) How many miles an hour do you think I could obtain? I might state I use the machine solo.—J.G.

(1.) It very frequently occurs that when a motor cycle is overhauled the carburetter and inlet pipe joints are not made airtight. If this is the case, you would find that the machine would behave in exactly the manner described in your letter. See that all unions are absolutely tight, that your magneto is in good order, that the carbon brushes are clean and are making good contact, and that the platinum point surfaces are bright, and we think you will then find that the machine will start easily and fire regularly. (2.) About seventy miles to the gallon. (3.) About fifty miles an hour if in good order.

EXPERIENCES WANTED.

"H.J.T." (Boxmoor).—Ixion sidecar-ette or Lévis or other small two-stroke or four-stroke and light sidecar.

"J.P.H." (Masselbrough).—Scott and Binks carburettors on Scott motor cycle using (1) Petrol, (2) benzole, and (3) paraffin, with special reference to m.p.g., slow running, power, and frequency of decarbonisation.

RECOMMENDED ROUTES.**EAST CROYDON TO CHESTER.—R.C.**

East Croydon, Croydon Road, cross Mitcham Common, Mitcham, Merton, Kingston Road, Raynes Park, Kingston, Teddington, Hounslow, Heston, Southall; here you are on the main Oxford Road, which follow through Beaconsfield, High Wycombe, West Wycombe, Stokenchurch, Wheatley; here turn right and go through Islip, Bletchington, Over Kiddington, Enstone, Chipping Norton, Broadway, Evesham, Worcester, Kidderminster, Bridgnorth, Wellington, Whitchurch, Chester.

SCARBOROUGH TO BETTWS-Y-COED.—E.H.B.

Scarborough, Pickering, Holmsley, Thirsk, Ripon, Ripley, Blubberhouses, Skipton, Gisburn, Citheroe, Whalley, Preston, Tarleton, Rufford, Ormskirk, Liverpool, by ferry to Birkenhead, Hawarden, Mold, Ruthin, Cerrig-y-Druoid, Pentre Voelas, Bettws-y-Coed. Approximately 210 miles. This route avoids as much traffic as possible, but entails a very hilly road to Skipton. The most direct route would be through a large manufacturing area, many towns, and much traffic.

MISCELLANEOUS ADVERTISEMENTS.

PRICES.

ADVERTISEMENTS in these columns—First 12 words or less 2/-, and 2d. for every additional word. Each paragraph is charged separately. Name and address must be counted. Series discounts, conditions, and special terms to regular trade advertisers will be quoted on application.

Postal Orders sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd., and crossed** & Co.

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.4), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge, which must include the words Box 000, c/o "The Motor Cycle." Only the number will appear in the advertisement. All replies should be addressed No. 000, c/o "Motor Cycle," 20, Tudor Street, E.C.4.

DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pays carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged; when under £10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

MOTOR CYCLES FOR SALE.

A.B.C.

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery of the new A.B.C. [2254]

CROW Bros., High St., Guildford, have contracted largely for the new A.B.C. Order now for earliest delivery. [5298]

JONES' Garage—We are in a position to accept orders for A.B.C. motor cycles; deposits optional; delivery April or May.—Broadway, Muswell Hill, N. [0991]

WE are now booking orders for earliest deliveries of A.B.C. motor cycles. Secure an early delivery by placing your order with us now.—Dawells' Garage, Wigan. Tel.: 328. [X3219]

A.B.C.—We are now taking orders for earliest deliveries, which commence about May; book early to be in time.—P. Ellis and Co., 360, Lillie Rd., Fulham, London, S.W.6. [5373]

A.B.C.—Earliest possible deliveries given. Write to us for specification and full particulars.—The Talbot Garage, Ltd., Mersey Sq., Stockport. Tel.: 500. Distributing agents for Lancashire and Cheshire. [0990]

Abingdon.

ABINGDON and Sidecar, smart turnout; £38.—Hall, next to Green Man, High Rd., Whetstone, N.20 [5340]

MAUDE'S MOTOR ART.

EARLIEST DELIVERIES OF 1919 MODELS.

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CONNAUGHT
NEW IMPERIAL
ROYAL ENFIELD

Immediate Delivery of 1919 Harley - Davidsons.

SECOND-HAND SIDECAR COMBINATIONS.

NORTON, 1916, 4 h.p., 3 speeds	£110
ROVER, 1918, 3½ h.p., 3-speed	£105
HARLEY-DAVIDSON, 1917, 7-9 h.p., elec.	£135
SUNBEAM, 1914, 3½ h.p., Gloria	£90
A.J.S., 1915, 6 h.p., electric lamps	£110
DOUGLAS, 1915, 4 h.p., Sidecar	£85
SUNBEAM, 1916, 3½ h.p., lamps, etc.	£130
P. & M., 1914, 7 h.p., 90 twin, new Sidecar ..	£115
A.J.S. 1918 3-speed Combination	£140
BAT, 1914, 6 h.p., J.A.P., 2-speed	£75
ENFIELD, 1916, 6 h.p., 2-speed	£115
BROWN, 1914, 3½ h.p., 3-speed	£68
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SUNBEAM, 1915, 3½ h.p., 3-speed	£95
SUNBEAM, 1916, 4-5 h.p., 3-speed, Cowey ..	£98
TRIUMPH, 1915, 4 h.p., 3-p. countershaft ..	£74
SUNBEAM, 1916, 3½ h.p., as new	£115
DOUGLAS, 1916, 2½ h.p., 2-speed	£50

LIGHT CARS.

MORGAN, 1915, Grand Prix, J.A.P.	£165
MORGAN, 1915, Grand Prix, 4 speeds ..	£185
MORGAN, 1915, G.P., yellow and black ..	£165
STELLITE, 1914, dickey seat	£235
CALCOTT, 1916, dynamo set, standard ..	£375
HUMBER, 1914, 10 h.p., dynamo and starter, as new	—
MORGAN, 1915, Grand Prix, overhead J.A.P.	£165
MORRIS-COWLEY, 1916, 10 h.p., coupé ..	—

100, GT. PORTLAND ST.,
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Telephones: Museum 557
Mayfair 552

Telegrams: Abdicade, Wesdo
London.



MOTOR CYCLES FOR SALE.

Abingdon.

ABINGDON King Dick, 1914, 3½ h.p., 3-speed, tyres good, lamps and horn; £30 for quick sale.—Martin's Motor Works, Sidmouth. [5525]

A.J.S.

CROW Bros., Guildford.—A.J.S. Agents since 1912. Write us for your requirements. [9777]

A.J.S. 1915 4 h.p. Combination, only 4 months' use; £100.—Martin's Motor Works, Sidmouth. [5526]

1919 A.J.S. Combinations—Write Merrick's Stores, 174, Listerhills Rd., Bradford. Phone: 2439. [X2430]

A.J.S. Combination, 6 h.p., 2-speed, all chain, excellent condition, stored during war; £60.—53, Brixton Rd., S.W. [5296]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery of the new A.J.S. [2255]

1918 A.J.S. 6 h.p. War Office Combination and all accessories; nearest £130 secures.—Melrose, Boughton Park, Worcester. [X5525]

A.J.S. 6 h.p. 1917 Combination de Luxe, complete, lamps, speedometer, hood and wind screen, as new.—A. Henderson, Westward Ho. [X5396]

A.J.S.—For quick deliveries try the sole Leicester-shire agent, Will Chapman, 113, Belgrave Rd., Leicester, the first appointed A.J.S. agent. [3531]

2½ h.p. 1916 A.J.S., 3 speeds, kick starter, recently overhauled at works (cost £29), absolutely as new and complete; £78.—Cross, Jeweller, Rotherham. [X5573]

3½ h.p. A.J.S., 3-speed, clutch, been re-enamelled, plated, and overhauled at cost of £16; £44; new appearance.—15, Birchwood Rd., West Byfleet. [5395]

A.J.S. 1918 Military Model Combination, hood, screen, lamps, spare wheel, splendid order, complete; £145.—Elce and Co., 15-16, Bishopsgate Av., Canonville St., E.C. [0551]

1918 6 h.p. A.J.S., military model, delivered Dec., done 650 miles, fitted lamps, etc., either separate or with coach sidecar to suit; what offers?—Walton, Dawson Sq., Burnley. [X5468]

A.J.S.—For the earliest possible deliveries of 1919 models, specifications, and super service, try the A.J.S. Specialists, The Walsall Garage, Wolverhampton St., Walsall. Phone: 444. [4663]

A.J.S. Spares, prompt delivery.—Cyril Williams, Chapel Ash Depot, Wolverhampton. Tel.: [9189]

Alldays

ALLON, 2½ h.p., 2-stroke, 2 speeds, perfect; £32.—211, Garratt Lane, Wandsworth. [5601]

1917 Allon, perfect condition; £28/10.—Guy, 59, Bathurst Mews, Sussex Sq., Paddington. [5566]

ALLDAYS Allon, 2½ h.p., 2-speed, 1916, had little wear, but shabby; £35.—3, Park St., Wellington, Salop. [X5444]

ALLDAYS-MATCHLESS, 4½ h.p., 3 speeds, countershaft, sidecar; £55.—211, Garratt Lane, Wandsworth. [5608]

ALLDAYS Allon, in stock, 1915 2-speed and 1916 2-speed hand clutch—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [5448]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery 2-speed and clutch Allons, £58; also De Luxe models, with kick start, £65. [2258]

Ariel.

CROW Bros., High St., Guildford, Ariel agents since 1913, have 1919 models in stock. [5299]

ARIEL, 3½ h.p. and 6-7 h.p.; early deliveries.—F. Speakman, Ariel Expert, 7, Rochdale Rd., Harpurhey, Manchester. [5269]

ARIEL, 3½ h.p., 1912, variable gear, decompressor, lamps, tool 2 tanks, spare valves, good tyres, smart, last used 1914; £26/10.—66, High St., Chatham. [5570]

ARIEL, 1915, 3-speed, 3½ h.p., with coachbuilt sidecar, countershaft gear, clutch, decompressor, lamp, horn, speedometer, electric rear lamp, splendid running order, only done 5,000 miles; £57/10.—1, The Crescent, Nottingham Rd., Melton Mowbray. [X5505]

RIDER TROWARD and Co., 31, High St., Hampstead.—New 3½ h.p. 3-speed Ariel in stock, £80. Orders being booked for earliest delivery 5-6 h.p. combination. [2257]

Arno.

ARNO, 3½ h.p., splendid condition, Philipson governor pulley, Stewart speedometer, acetylene lighting set, Dunlop tyres and belt; £32, bargain.—88, Rosebank Avenue, Sudbury Hill, Middlesex. [5497]

Auto-Wheels.

UTO-WHEEL, Model de Luxe, complete, perfect running order, equal to new.—Akrill, 18, Market Place, Eberley. [X4856]

MOTOR CYCLES FOR SALE.

Auto-Wheels.

AUTO-WHEEL, little used, £8/8; another, £10/10; exchanges.—Geo. Smith, Motor Cycle Depot, Clapham Junction (opp. Arding and Hobbs). [X5404]

AUTO-WHEEL, good hill-climber, attached strong B.S.A. bicycle, all in good running order, also spares; what offers?—Box L9,774, c/o The Motor Cycle. [X5456]

WALL Auto-Wheel, Amac carburettor, mag., decompressor, little used, and in first-rate condition, runs well on benzol; £10.—Smith, 55, S. Norwood Hill, S.E.25. [X5552]

AUTO-WHEEL, complete, new condition, perfect running order, guaranteed; can be seen by appointment; price £12/12, 6s offers.—Craig, 231, Grove Terrace, Whitworth, Rochdale. [X5392]

Bat.

BAT-J.A.P. 8hp. 3-speed 1915 Combination, perfect condition.—Box 3,059, c/o The Motor Cycle. [X5516]

BAT Motor Cycle, 3-speed Armstrong, U.K. mag., Watatwa belt, sidecar chassis, with tyres, engine requires repairs; £10, or offers.—W. H. Bront, Sunnyside, Hatch Ride, Crowthorne, Berks. [X5541]

Blackburne.

CROW Bros., High St., Guildford, are old Blackburne agents, and can give early deliveries. [X5300]

JONES' Garage.—We can accept orders for all models of Blackburne motor cycles; delivery expected in April; deposits optional.—Broadway, Muswell Hill. [X0992]

Bradbury.

BRADBURY, 4hp., free engine; £28; any trial.—272, Green St., Upton Park, E. [X5631]

BRADBURY 4hp. Combination, free engine, pedal start; £28.—29, St. Leonard's St., Bromley-by-Bow. [X5537]

BRADBURY 4hp. Combination, 2-speed free engine gear box, lamps, speedometer, spares; £45.—1, Ward's Ter., Broad Lane, Tottenham. [X5713]

BRADBURY and Sidecar, fine condition, 4hp., 2-speed, clutch; bargain, £55; bought car.—Corawell, Shoreham, Sevoinks, Kent. [X5306]

BRADBURY, 3½hp., 2-speed, and sidecar, thorough mechanical condition, Dunlops, front nearly new, back little wear; seen Saturdays and Sundays, by appointment preferred; £55, or near.—11, Gilton Rd., Sydenham, S.E.26. [X5514]

BRADBURY, 4hp., new cylinder, piston, complete, B. and B., P. and H. lamp, good belt; £17; Humber, 3½hp., 1911, new tyres, Senespray, good condition, not ridden last 3 years, horn, lamp, etc., £21.—Kirby, Snitterby, Kirtton-Lindsey, Lincs. [X5506]

BRADBURY 6hp. Combination, believed 1915, 3-speed countershaft, handle-bar clutch, kick starter, Lucas horn, lamps, tools, excellent condition, engine just overhauled and rebushed, new chain, good tyres; £80; seen evenings or week-ends.—Challis, 11, Allmarthing Lane, Wandsworth. [X5638]

Brough.

BROUGH, 3½hp., 2-speed countershaft, flat twin; price £60.—27a, Ashchurch Grove, Shepherd's Bush. [X5531]

DAN GUY, Weymouth.—1916 3½hp. Brough, 2-speed gear, overhauled by makers; guaranteed condition, £55. [X5686]

BROUGH—A limited number of 5-6hp. flat twin combinations; delivery in April.—G. W. Wilkin and Co., sole agents Sheffield and district, Hunters Bar, Sheffield. [X5612]

B.S.A.

B.S.A., 3-speed, 1919 models in stock.—Reys, 378, Euston Rd. [X2972]

NEW B.S.A.'s in stock; immediate delivery Model K.—Alexander, Agent, Wallasey Village. [X506]

B.S.A., 3-speed, kick starter, countershaft model; £58.—Clapham (Motors), King George St., Greenwich. [X5527]

1914 B.S.A., unscratched, with lamps; 35 gns.; ride away.—Wright, 113, Blair St., Poplar, London. [X5463]

B.S.A., 3½hp., 2-speed, clutch, chain-cum-belt; £33.—Earls, The Vale, Hampstead. Phone: 3287 Hamp. [X5679]

B.S.A., 1916, chain-cum-belt, and coachbuilt sidecar, excellent condition, any trial; 65 gns.—Tew, Petersfield. [X5467]

B.S.A. Clutch Model Combine, 2 lamps, speedometer, in excellent condition and tyres, any trial; £45.—38, Upham Park Rd., Chiswick. [X5461]

4½hp. B.S.A. Combination, 3-speed countershaft, all chain, lamps, speedometer, etc., late model; £75.—Thorpe, Whitehorse Rd., Thornton Heath, S.E. [X5516]

B.S.A.—For the earliest possible deliveries of 1919 models, specifications, and prices, sole district agents, The Walsall Garage, Wolverhampton St., Walsall. Phone: 444. [X4669]

B.S.A. "K" actually in stock, 76 gns.; also 1916 "K" combination and 1917 "K" combination, £92/10.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [X5447]

5 Weeks

—and Easter's here—and
what about your Motor Bike?

It's time you "got a move on"—
time you thought about its purchase—time you called at "P. J. EVANS' Depot" for that purpose!

Here you'll find a splendid stock
of all the leading models—a stock
to meet the needs of EVERY
rider, all ready for the Road.
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PERIAL, ZENITH,
TRIUMPH,
JAMES, HUMBER,
BLACKBURN, ETC.**

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**G.W.K.
CALTHORPE,
STANDARD.**

Don't procrastinate—there's 5
weeks only—and these will soon
slip by; so when you're near by
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parisons, expert advice in selection,
EARLY DELIVERIES,
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the advantages
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MOTOR CYCLES FOR SALE.

B.S.A.

RIDER TROWARD and Co., 31, High St., Hampstead.—New 4½hp. B.S.A., chain-cum-belt, in stock, £79/16. Orders being booked for earliest delivery chain drive model, £81/18. [X2259]

1917 B.S.A., 4½hp., 3-speed, chain-cum-belt, best Empire coachbuilt sidecar, Lucas lamps and horn, speedometer, usual spares, low mileage, good condition; £80.—Turner, Hawthorne Villa, Norton, Stonbridge. [X5183]

WALBRO Motor Works, Ely, Cambs.—B.S.A. 1915 combination, 3-speed bottom bracket, chain-cum-belt, all in excellent condition, good coachbuilt sidecar, large P. and H. head lamp, Lucas rear lamp, horn, practically new belt; £75. [X5316]

B.S.A., 1916, 4½hp., 3-speed, clutch, kick start, and coachbuilt sidecar, acetylene head, electric side and tail, accumulator, first-class condition, complete set tools, spare belt and chain; bargain, £84/10, or very near offer.—2, Seagrays Rd., Wanstead. [X5577]

WALBRO Motor Works, Ely, Cambs.—B.S.A. 1916 combination, 3-speed bottom bracket gear, chain-cum-belt, Lucas head and rear lamp, Lucas horn, all tools, smart coachbuilt sidecar, tyres and belt very good, front mudguard bent, otherwise as new; £85. [X5317]

B.S.A., 4½hp., late 1914, 3-speed, all-chain countershaft (not used over 3 years), mechanically perfect, with coachbuilt sidecar, complete with hood and screen, tools, horn, lamps, beautiful turnout; bargain, £85 cash, no offers.—Reply, Lincolnshire, Box L3,041, c/o The Motor Cycle. [X5496]

Buckett.

3½hp. Buckett, Chater-Lea torpedo tanks, engine perfect, wants painting, suit learner; £12.—Field, 24, Wadlow Rd., Willesden, N.W. [X5311]

Calthorpe.

CALTHORPE-J.A.P., 1915, Enfield gear, as new; £35.—Ball, 49, Riverside, Kingstou-on-Thames. [X5448]

RIDER TROWARD and Co., 31, High St., Hampstead.—Immediate delivery new Calthorpe, all models. [X3603]

CALTHORPE, 1918, 2-speed, 2-stroke, ridden 3 months; £35.—Mappletons, Bradfield, near Reading. [X5308]

BRAND New Model, just uncrated, 1919, 2-speed, clutch, 2-stroke, Calthorpe; £45.—Clarke, Queen St., Louth. [X5707]

CALTHORPE Lightweight, 2 speeds, all accessories, very nice condition; £25.—Bunting, Masons Ave., Wealdstone. [X5619]

1916 Calthorpe-Jap, 2½hp., 2-speed, one year's use, speedometer, lamps; £32, offers.—Walker, Fishwood, Balloch. [X5576]

CALTHORPE Motor Cycles—All models in stock for immediate delivery.—P. J. Evans, 91, John Bright St., Birmingham. [X0955]

CALTHORPE Junior, 2-speed, free, mag., new tyre, new belt; £20; ready to ride away.—Avondale, Southampton St., Farnborough, Hants. [X5548]

CALTHORPE-J.A.P., 1919 models: delivery from stock of 2½hp. 2-speed; £52.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [X0552]

1914 Calthorpe Junior, Precision engine, 2½hp., 2-speed, lamp and horn, perfect condition; price £24.—43, Woodside Gardens, Bruce Grove, Tottenham, N.17. [X5524]

CALTHORPE-J.A.P., 2½hp., 1915, Dixie mag., Sen spray carburettor, Enfield 2-speed gear, condition as new, Lucas accessories, complete; £35.—The Chalf., Rutland Rd., Bourne, Lincs. [X5499]

CALTHORPE-J.A.P. Motor Cycle, as new, ran only 12 miles, Lucas lamps never lit, owner buying car; £40 for quick sale.—Dr. Thomson, 1, Arcadian Gardens, Bowes Park, Palmers Green 463. [X5397]

CALTHORPE-J.A.P., 1917, 2½hp., Clincher studded tyres, not done 100, C and H drive, aluminium footboards, De Luxe saddle, King of Road lighting set, drip feed, and pump lubrication, perfect condition; after 6; £50.—168, Crayford Way, Crayford, Kent. [X5587]

Campion

4½hp. Campion Precision, 2-speed and clutch, with fine coachbuilt sidecar, all chain drive, just overhauled; tried here; £45, or nearest.—James Pollard, Wragby, Lincoln. [X5709]

CAMPION-J.A.P. 4hp. 1916 Combination, clutch, 3-speed, kick starter, all accessories, practically new; £70, no dealers.—Apply, J. Storey, Beaumont Arms Hotel, Shepherd's Bush, W.12. [X5406]

Chater-Lea-Jap.

CHATER-LEA, 8hp. J.A.P., Bosch, good order, single speed, £25; Chater-Lea, 8hp. Rex, free engine hub, smart and fast, £26.—3, Park St., Wellingdon, Salop. [X5442]

Clyno.

CLYNO Combination, splendid condition; any trial; £95.—23a, Upper Kennington Lane, London, S.E. [X5292]

CROW Bros., High St., Guildford, West Surrey agents for the 1919 Clyno. Order now to ensure early delivery. [X5553]

MOTOR CYCLES FOR SALE.

Clyno.

CLYNO 5-h.p. Coachbuilt Combination, full equipment, condition as new; price £46.—Martin, 47, Holmewood Gardens, Brixton Hill, S.W. [5419]

6 h.p. Clyno Combination, 3-speed countershaft, clutch, spare wheel and tyre, horn; 70 gns. or near offer.—12, Victoria Quadrant, Weston-super-Mare. [X5543]

Connaught.

CONNAUGHT 2-stroke, 2½ h.p., lighting set, horn, footboards, good condition, ride away; £25.—H. Woods, Normandy, Nr. Guildford. [5509]

1916 Connaught, 2½ h.p., 2-speed countershaft, good Dunlops, fast, reliable, very good condition; price £29/10.—D.B., 136, Harrington Rd., South Norwood. [5437]

Coventry Eagle.

COVENTRY Eagle, 2½ h.p., 2-stroke, almost new; bargain, £35.—125, Canal Rd., Mile End. [5590]

COVENTRY Eagle, 2½ h.p., 2-stroke, late 1915, very little used, hardly discernible from new machine; £25.—Pamunt, 16, Mayfield Av., Chiswick, W.4. [5352]

Dalm

DALM 2-stroke, 1915 model, purchased this year, not done 100 miles, splendid running order and condition; trial given; £26.—19, Stockwell Park Crescent, S.W.9. [X5465]

DALM, 1915, 2½ h.p., 2-stroke, 2-speed gear, E.I.C. mag., tyres and belt as new, in very good condition, and mechanically sound; a great bargain, £27/10.—E. Gordon, 1, Layston Villa, Royston, Herts. [5581]

Dot

DOT-J.A.P. Combination, 8 h.p., wind screen, lamps, in thorough condition; £80.—Kearsey, 99, Hoppers Rd., Winchmore Hill, N.21. [5417]

DOT-J.A.P., 90x77, 5 h.p. twin, 1916, S.C. chassis, speedometer, large Lucas lamp, Jardine gear, perfect; £70.—211, Northumberland Park, N.18. [5433]

Douglas.

1913 Douglas, 2 speeds, etc.; £30.—Drews' Garage, Upminster, Essex. [4948]

DOUGLAS, 2½ h.p., single speed; £16.—29, St. Leonard's St., Bromley-by-Bow. [5543]

DOUGLAS, good order; £18.—Hall, next Green Man, High Rd., Whetstone, N.20. [5539]

DOUGLAS 4 h.p., as new, fully equipped; £57.—27, Gayhurst Rd., Dalston, E.8. [5369]

DOUGLAS, 1913, 2-speed, lamps, etc., overhauled; £34.—37, St. Stephen's Rd., Bow, E.3. [5642]

DOUGLAS, 1914, T.T., free engine, 2-speed; £38/10.—Ball, 49, Riverside, Kingston-on-Thames. [X5447]

DOUGLAS, 1915, 2-speed, W.D. model.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [5445]

DOUGLAS, 2½ h.p., 1914, 2-speed, T.T., splendid condition; £40.—Rev. Braybrooke, 48, Maple Rd., Sarnia, N. [X5538]

DOUGLAS in Stock, 4 h.p. combination, £105; War Office 2½ h.p. model, £60, new.—Modat, Yeovil. [1103]

GIBB, The Douglas Expert, Gloucester, is the man to get in touch with for best deliveries and advice. Phone: 852. [4749]

DOUGLAS, 1911, excellent condition, not used last 4 years; approval willingly; £20.—Jayoni, Bury St. Edmund's. [5546]

1914 Douglas, 2½ h.p., overhead valves, special machine, perfect, flier; £48/10.—Cecil Mott, Littleport, Cambs. [X5452]

1915 Douglas Motor Cycle, beautiful condition; cheap.—Storey, 7, Blenheim Terrace, Abbey Rd., St. John's Wood, N.W.8. [5588]

DOUGLAS, 1914, 2½ h.p., 2-speed, clutch, kick starter, accessories; £45.—Lt. Disney, Rossie, Kingston Hill, Surrey. [5558]

1915 2½ h.p. 3-speed Douglas, first-class condition, spares, etc.; £50, no offers.—W. Owens, Brunswick Rd., Buckley, Chester. [X5498]

1914 Douglas, 2 speeds, Lucas lamps, nearly new tyres and belt, in first-class condition; £45.—133, Archway Rd., Highgate. [5674]

DOUGLAS, 2½ h.p., 1913, 2-speed, good condition, new back tyre, recently overhauled; £34.—Egbert Spearman, Bishops Stortford. [5529]

DOUGLAS, 2½ h.p., 1914 model, 2-speed, lamps, horn, etc., in good condition; £38.—33, Upton Rd., Donnam Rd., Dalston, N. [5507]

1919 Douglas Motor Cycles, delivery from stock 2½ h.p. 2-speed, £60; 4 h.p. 3-speed combination £105.—Tom Norton, Ltd., Llandrindod Wells. [X4621]

DOUGLAS, 2½ h.p., 2-speed, T.T., nearly new, complete with all accessories; £50, or exchange with cash for combination.—Melrose, 1, Keoloe Rd., Tooting. [5377]

DOUGLAS, late 1915, 2½ h.p., 3 speeds, Stewart speedometer, Miller lamps, horn, spares, all tools, not ridden 200 miles; £55.—Whitehouse, Dodworth, Barnsley. [X5472]

THE PROOF OF THE PUDDING!

From *The Motor Cycle*,
March 6th., 1919.

Makers and Prompt Service.

SIR,—In your issue of February 13th I noticed that "G.R." was worried by the fact that he wanted to cancel his order for a machine, and the firm he ordered it from refused to cancel it. I should like first to state my experience in that direction.

Two months ago I ordered a Big 4 Norton sidecar from Messrs. Godfrey's, Ltd., to be delivered this February. Only thirty days ago I discovered that I should have to cancel the order, as I have to go out East. I wrote Messrs. Godfrey's, and asked if they would cancel the order, and explained why. By return of post I received a very courteous letter and also a cheque for £5, the deposit I paid in December. This difference in treatment, I think, well illustrates the difference in firms. I do not know from which firm "G.R." ordered his machine, but I think I know where he will go for another machine when he wants one. I was treated exceptionally well by Messrs. Godfrey's, and I have no interest in the firm whatever, except that of a prospective customer. When possible I shall go straight to them for my machine.

W. T. VIZER-HARMER (Lieut.).

The above is
authentic proof—
if proof be needed
—that Godfrey's
always study the
interests of their
customers.

Write for full lists of new
machines for which we
can accept orders.

Sole distributors, London
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best makes

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Telephone—7691 (anyday 2 lines).

MOTOR CYCLES FOR SALE.

Douglas.

DOUGLAS, 1911, re-enamelled and plated, tyres good, engine just overhauled; first 416 cc.; scip.—Brown, c/o Ford, 56, Claremont St., Stapleton Rd., Bristol. [X5586]

DOUGLAS, not unpacked, new 1918, as delivered from makers, not yet been run; price £75.—Apply, Autolee, 412, High Rd., Lee, S.E. Phone: Lee Green 707. [5278]

WALBRO Motor Works, Ely, Cambs.—Douglas, 1917, T.T., W.D. model, lamps, horn, all in new condition, speedometer, Lucas horn, P. and H. head and rear lamps; £55. [X5313]

1914 Special Semi-T.T. Douglas, lamps, tyres, belt, Binks carburettor, all new, stored 3½ years, exceptionally fast, first-class condition; £45.—Brynmaer, Throley Rd., Sutton, Surrey. [5284]

ELI CLARK can give you good advice also good deliveries of 1919 Douglas motors. He will help you if possible with spares. The man on the spot.—196, Cheltenham Rd., Bristol. Phone: 4169. Wires: Ignition, Bristol. (Please do not send sample spares.) [0966]

DOUGLAS, 4 h.p. and 2½ h.p., brand new models, in stock. We are stockists and specialists of Douglas machines only, giving the finest service and the greatest choice of models in the South. Over nine years' experience as Douglas agents.—Thompson and Co., 408, Commercial Rd., Portsmouth. Phone: 7105. [2518]

2½ h.p. Douglasses, brand new, fitted 2-speed gears, 24 touring or semi-T.T. bars, footboards 15/6 extra. £60; two best lamp sets, horn, registration, writing number plates, £4/4 extra; enquiries invited, full specification by post.—Robinson's Garage, Green St., Cambridge. Tel.: 388. T.A.: Bicycles. [5623]

4 h.p. Douglasses, brand new, fitted 3-speed gears, 24 touring or semi-T.T. bars, footboards 15/6 extra. £60; two best lamp sets, horn, registration, writing number plates, £5/10 extra. Enquiries invited; full specification by post.—Douglas Specialists, Robinson's Garage, Green St., Cambridge. Tel.: 388. T.A.: Bicycles. [5622]

Enfield.

ENFIELD, all models, early deliveries.—J. A. Stacey, Sole Agent, 12, Ecclesall Rd., Sheffield. [X1543]

ENFIELD 6 h.p. Combination, thorough repair, just overhauled; £60.—Powell, Badsey, Evesham. [X5471]

ENFIELD Combination, dynamo lighting, hood, scree, speedometer; £130.—272, Green St., Upton Park, E. [5627]

ENFIELD Combinations and 2-strokes. Early deliveries.—Sole Agent, Longman, Bisherton St., Salisbury. [4854]

ENFIELD 1916 6 h.p. Combination.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [5449]

ENFIELD, 3 h.p., 2 speeds, kick starter, lamps, mechanical horn; £41.—Terry, 16, Grove Parade, East Finchley. [5681]

ENFIELD 3 h.p. Twin, T.T. 1915, done 3,000 miles, original tyres nearly new; £40.—Box 3,043, c/o The Motor Cycle. [X5544]

1913 6 h.p. Enfield Combination, perfect running order; £52; seen by appointment.—F.G., 51, Sand-cliff Rd., Erith, Kent. [5443]

RIDER TROWARD and Co., 31, High St., Hampstead, Orders now being booked for earliest deliveries Enfields, all models. [2261]

ENFIELD 3 h.p. Twin, 2-speed, kick starter, new tyres, all in perfect condition; £43.—Earls, The Vale, Hampstead. Phone: 3237 Hamp. [5677]

ENFIELD 3 h.p. Twin, Model 140, 2 speeds, etc., slightly soiled; 50 gns.—The Exeter Motor Cycle and Light Car Co., Ltd., Bath Rd., Exeter. [0958]

1916 Enfield Combination, Lucas lamps, horn, speedometer, etc., new condition throughout; any trial; £93.—Bumpson, Hatley Rd., Gamlingay, Sandy, Beds. [5655]

1917 6 h.p. Enfield Combination, hood, speedometer, etc., absolutely as new, used few times only; £115.—436, Whitehorse Rd., Thornton Heath, S.E. [5515]

JONES' Garage—We are accepting orders for all models of Enfields; one delivery promised this month; deposits optional.—Broadway, Muswell Hill. [0993]

1916 Enfield Combination, Enfield gears, hood and wind screen, perfect condition, little used owing to petrol restrictions; what offers?—W. Owens, Brunswick Rd., Buckley, Chester. [X5499]

ENFIELD 6 h.p. Combination, hood, screen, lamps (electric), 115 gns.; another, 70 gns.; exchanges.—Geo. Smith, Motor Cycle Depot, Clapham Junction (opp. Ardington and Hobbs). [X5402]

3 h.p. Enfield Combination, delivered Dec., 1916, hood, screen, and usual accessories, driven by owner only, excellent condition; £96; seen by appointment.—Ballard Combe, Combe Warree, Kingston Hill. [5522]

ENFIELD Pre-war 6 h.p. J.A.P. Combination, excellent condition, engine as new, tyres good, lamps, horn, wind screen, spare chain and valves; any test, £70; at Bonfield's Garage, Bridport.—E. Leathall, Laverstock, Beaminster. [X5530]

MOTOR CYCLES FOR SALE.

Enfield.

ENFIELD Combination, 6h.p., bought new March, 1917, complete with lamps, horn, wind screen, tools, etc., excellent condition, only run about 1,800 miles; £105, or part exchange Douglas.—Brown, 51, Broad St., Ross, Herefordshire. [X5581]

6h.p. Enfield Combination, delivered 1917, fitted with hood, screen, Lucas lamp with most expensive generator, speedometer, mudshield, and Binks carburettor, tyres unpunctured, guaranteed perfect in every way; price £120.—Hood, 45, Bow Common Lane, Bow, E. [5188]

Excelsior.

AMERICAN Excelsior Combination, 1916, dynamo lighting; £105.—Melrose, 1, Kenlee Rd., Tooting. [5376]

EXCELSIOR, 7-9h.p., 2-speed, double sidecar, not been 2,000; £90.—B., George Hotel, Witham. [5575]

9h.p. American Excelsior, 1913, stored 3 years, o.h.v., racing cams, countershaft clutch, Schreiber, Bosch, very fast; £35.—187, Snowdrop Rd., Welling, Kent. [5281]

EXCELSIOR (American) 7h.p. Twin and coachbuilt sidecar, 2-speed kick start, clutch, Bosch mag., Jones speedometer, lamps, mechanical horn, mechanical and pump oiling, large tyres, enamel, tyres, appearance, and going thoroughly good; seen London district; £80, or close offer.—Apply, Eric Liddell, 4, Braehed Terrace, Maxwelltown, Dumfries. [5311]

F.N.

5-6h.p. F.N., 2-speed, clutch, heavy Dunlops, good condition; £27/10.—13, North St., Barking. [5473]

F.N. Lightweight, 2 speeds, pedal start, first-class order; £28.—Bunting, Masons Av., Wealdstone. [5618]

2 1/2h.p. F.N. 2 speeds, clutch, Bosch, lamps, horn, 24" rido away; £14.—McCartney, 1, Golden Cross Cottages, Church St., Woolwich. [X5182]

F.N., 2 1/2h.p., 2 speeds, shaft drive, stored since 1914, excellent condition; £14.—Smith, 35, Kensington Place, London, W.1. [5641]

LATE 1914 5-7h.p. 4-cyl. F.N. Motor Cycle, live shaft bevel drive, 2-speed gear box, hand controlled plate clutch, Bosch type F.N. mag., F.N. carburettor, double spiral cantilever spring forks, internal expanding foot brake, basket sidecar, leather upholstery, elliptic springs, Chater-Lea fittings, in new condition; £60.—New Red Lion, Thorp, Chertsey, Surrey. [X5488]

Grandex.

GRAND-EX-PUP, 2-speed; £18; fine condition.—272, Green St., Upton Park, E. [5630]

1914 5-6h.p. Grandex-Precision Twin, hardly used, C.B. sidecar, hood, etc., 2 speeds, etc., speedometer, practically as new, very fine lot, lighting set, etc.; bargain, £75.—Drews Garage, Uxminster, Essex. [4947]

Green.

3 1/2h.p. Water-cooled Green-Precision, overhead valves, 32 less mag., otherwise in good going order, spring forks, £13; 3 1/2h.p. Quadrant engine, complete with pulley and magneto wheel, 50/-—55, Stanway Rd., Coventry. [X5491]

Harley-Davidson.

HARLEY-DAVIDSON Combination, Oct., 1915, in splendid condition; 70 gns.—97, Malvern Rd., West Kilburn. [5371]

HARLEY-DAVIDSON 1915 Combination, in perfect running condition, 7-9h.p.; £90.—3, Liverpool Rd., Islington, W.1. [5428]

HARLEY-DAVIDSON, 1916, 7-9h.p., electric model, B.S.A. sidecar, little used; £115.—Dargent, 1b, Alma Ter., South Harrow. [5660]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new Harley-Davidsons. [2262]

1916 Genuine T.T. Harley, as new, mileage under 600; exchange for 3-speed model Harley.—Graham, 12, Spring Rd., Wrexham. [5663]

1915 Harley-Davidson Combination, 7-9h.p., 3 speeds, splendid condition, Swan coachbuilt sidecar; £69.—Bramley Oswell, Hadley, Wellington, Salop. [X5537]

1915 Harley-Davidson, 7-9h.p. combination, electrically equipped, perfect, not been 2,000 miles; £68.—Builder, 172, Queen's Rd., Peckham, S.E. 'Phone: New X 236. [5563]

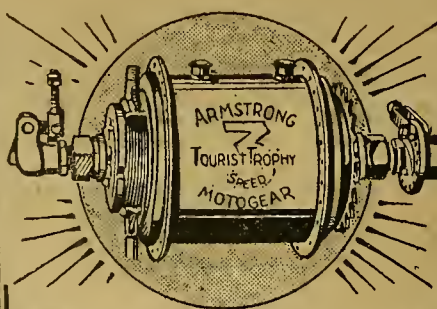
7-9h.p. Harley-Davidson, 1917 magneto model, fitted with discs, condition as new, complete with horn, lamp, speedometer, and accessories; price £110.—Rankin, Market St., Stranraer. [X5594]

HARLEY-DAVIDSON, 1916, 7-9h.p., electric model, and sidecar, in exceptional condition; also new 1919 model, now at London Docks.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [5450]

Henderson.

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new Hendersons. [2264]

HENDERSON 1915 Combination, 4 cys., sporting sidecar, all in perfect condition; £85.—Sydney Pearson, Gate House, Chylesmore, Coventry. [X5592]



Armstrong and Sturmey-Archer

GEAR REPAIRS

in

4

HOURS.

We have every Armstrong and Sturmey-Archer part actually in stock. We can repair your gear in four hours with tested parts exactly as we are supplying to the British and Allied Governments and guarantee them.

RECOMMENDED BY
THE
STURMEY-ARCHER Co

E. C. Neil, Esq., Pease Hill Farm, Ripley, writes:

"I have broken my compound cage and have been advised by the Sturmey-Archer Co. to write to you."

S. Hoole, Esq., Offerton Grange, Sunderland, writes:

"In March last you repaired my Armstrong gear and it has given me every satisfaction since—no trouble whatever."

H. O. O. Rubbin, Esq., Stocken Hall, Stretton, Oakham, writes:

"I may say that the hub which you repaired for me early last year has never given any trouble since."

We claim the following to be a RECORD IN GEAR REPAIRS.

Coworth Park, Sunningdale, Berks, 14/12/16.

Dear Sirs,—I must thank you very much for repairing my gear while I waited. To fit new parts and assemble gear complete into wheel, after same has been completely dismantled, in about **thirty minutes**, speaks very well for your tools, workmen, and organisation. I have since tested the gear and found it perfect.

Yours faithfully, W. H. BROOKS.

Make a note of address. If you have gear troubles, write, wire, 'phone, or call.

Send wheels to Hounslow, L. & S.W. Ry., clearly labelled with sender's name. Nearest station for callers, Heston—HOUNSLOW District Railway.

COUNTY ENGINEERING Co.

64, STAINES ROAD, HOUNSLOW, LONDON, W.

Wires: "Threespeed." 'Phone: Hounslow 322.

MOTOR CYCLES FOR SALE.

Humber.

HUMBER, 3 1/2h.p., 2-speed, handle start, stored during war, ride away; £22.—Wright, 111, Horninglow St., Burton-on-Trent. [X536]

1914 Humber 2 1/2h.p. Twin, clutch, lamps, new condition; 35 gns.—15, Carlton Terrace, Finchley Rd., Childs Hill, N.W. (after 6). [546]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new 3 1/2h.p. and 6h.p. flat twin Humber. [2262]

HUMBER, 3 1/2h.p., chain drive, Druid forks, Bosch good condition, splendid climber; bargain, £14 or near offer.—Wainwright, 12, Stanley Rd., Teddington Middlesex. [5317]

HUMBER, 3 1/2h.p., 3-speed, clutch model, and coachbuilt sidecar, excellent condition; owner in France; bargain, £40.—The Haven, 120, Sutherland Rd., West Croydon. [5643]

3 1/2h.p. 1912-13 Humber and wicker sidecar, 2-speed, 32 handle starter, lamps, horn, etc., perfect running order; would exchange with cash for 5-6h.p. combination.—Magda, The Crescent, Sutton, Surrey. [5647]

1915 Humber, 3 1/2h.p., 3-speed S.A. hub and clutch, Millford sidecar, all accessories, only done 1,900 miles; good bargain for £60: can be seen by appointment after 6 p.m.—B., 2, Clyde Rd., Alexandra Park, London. [X5356]

Indian.

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new Indians. [2263]

INDIAN, late 1915, 7-9h.p., 3 speeds, Swan sidecar, topping condition; £85.—25, Warham St., Kensington Park. [5518]

INDIAN 7-9h.p. Road Racer, 1915, done 3,500 miles, splendid condition, tyres new; £55.—Box 3,043n, c/o The Motor Cycle. [X5572]

INDIAN Combination, 7-9h.p., 1915, 3 speeds, kick starter, condition as new; £85.—Rogers, 23, High St., Bromley, Kent. [5411]

DAN GUY, Weymouth.—1916 Powerplus Indian and sidecar, head and tail lamp, horn, and complete set of tools; £85. [5684]

INDIAN, 7-9h.p., 1915, stored 2 years, clutch model, heavy Dunlops, Klaxon, lamps; £65.—30, Colebrook Row, Islington, N.1. [5489]

1915 Indian T.T., 7-9h.p., clutch model, new condition; £45, offers; any trial—"Suva," Hendon Lane, Church End, N.3. [5283]

INDIAN, 7-9h.p., new, 1913, 2 speeds, hand clutch, kick start, unused since outbreak of war, cash to 60; £45.—Bunting, Masons Av., Wealdstone. [5621]

1915 Indian, 7-9h.p., clutch, non-slip tyres good as new, large head lamp and spare chain, perfect running order; £50.—2, Thorold Rd., Chatham, Kent. [X5368]

1914 Indian 7-9h.p. Road Racer, not used during war, recently overhauled, excellent condition; £60.—Lt. Critchley, Victoria Park, Wavertree, Liverpool. [X5451]

INDIAN Combination, 1915, 7-9h.p., 3 speeds, spring frame, electric light, disc wheels, beautiful turnout; £85, exchange.—24, Beauval Rd., East Dulwich. [5564]

INDIAN, 1916, 7-9h.p., T.T. clutch model, not been 1,000 miles, splendid condition, £62; also 2-seater sidecar to match, £15/15; bargain.—136, Lambeth Walk, S.E. [5517]

INDIAN 1916 5-6h.p. Coach Combination, 3 speeds, clutch, kick start, in new condition throughout; £78.—Pent, 72, The Chase, North Side Clapham Common, S.W.4. [5514]

HENDEE Special, 1914, 2 speeds, electric starting, lighting, and horn, Mills-Fulford sidecar, in splendid condition; all accessories.—Miller, 49, Sandcliff Rd., Erith, Kent. [5562]

INDIAN Combination, 1916, 7-9h.p., 3 speeds, electric outfit, tools, spurs, etc., stored 2 years, as new; must sell; sacrifice £60.—Tomlinson, 19, Silver Rd., St. Margaret's-on-Thames. [5427]

INDIAN 5-6h.p. 3-speed Combination, complete lamps, speedometer, outfit as new; 95 gns.; exchanges.—Geo. Smith, Motor Cycle Depot, Clapham Junction (opp. Ardington and Hobbs). [X5401]

1916 Powerplus Indian (red), Swan sidecar, 3 speeds, K.S. hand and foot clutch, mag., dynamo set complete, speedometer, spring frame, practically new condition; £115; no dealers.—Jeffries, 32, Felstead Rd., Wanstead, Essex. [5542]

INDIAN, 1917, T.T. clutch model, 7-9h.p., Clincher tyres good, mechanical oiling, Klaxon horn, 2 lamps and generator, spring front and rear, aluminium footboards, pan saddle, splendid condition; £65; after 6.—24, Barnes Cray Walk, Crayford, Kent. [5586]

Invicta.

INVICTA, Villiers 2 1/2h.p. 2-stroke, new engine parts and Dunlop on back, January, £25; also Watsonian light sidecar, cheap.—Thompson, 40a, Underhill St., Bridgnorth. [5416]

MOTOR CYCLES FOR SALE.

Ivy.

IVY Motor Cycles.—For immediate delivery of these famous 2-stroke machines, try The Walsall Garage, Wolverhampton St., Walsall. Phone: 444. London Depot: H. G. Henly and Co., 91, Gt. Portland St., W.L. Phone: 4084 Mayfair. [4672]

James.

DAN GUY, Weymouth.—New 5-6h.p. James Combination; 4½h.p. big James combination for March delivery. [5689]

JAMES.—Immediate delivery of all models.—Sole district agents, The Walsall Garage, Wolverhampton St., Walsall. Phone: 444. [4671]

JAMES, 4½h.p., 3-speed, K.S., all chain drive, combination, go anywhere; £70; accept lightweight and cash.—Avon Motor Cycle Co., Southbridge Rd., Croydon. [5616]

1914 James Combination, 2-speed countershaft, kick start, enclosed chain drive, original tyres, little used; any trial; perfect; £65.—45, Brookfield Rd., Bedford Park, Chiswick, W.4. [5645]

JAMES 1914 4½h.p. 3-speed Combination, complete, tools, spares, Lucas horn and lamps, Stewart speedometer, stored 3 years, well looked after, perfect condition, original owner; £85.—T., 45, Elgin Av., Paddington. [X5528]

RIDER TROWARD and Co., 31, High St., Hampstead.—James machines. Delivery this month new 5-6h.p. twin combination, £126; 4½h.p. solo, 85 gns.; combinations, 104 gns.; delivery February, 3½h.p. twin, 85 gns.; March, 2½h.p. 2-stroke. Orders accepted in strict rotation. [2267]

1914 James Combination, big single, 3 speeds, all chain drive, with lamps, tools, spares, speedometer, mileage very low, overhauled recently, new Dunlops (heavies), a smart turn-out, not been used since 1916; £54; good as new.—G. North, Canteen, Dagenham Docks, Essex. [5384]

WALBRO Motor Works, Ely, Cambs.—James 1916 combination, 4½h.p., all chain drive, large P. and H. lamp set, P. and H. horn and rear lamp, speedometer, mirror, all tools, £22 sidcar (James), wind screen, cover-all apron, original tyres unpunctured, whole combination as new, done about 300 miles, 3-speed bottom bracket; £95. [X5318]

J.A.P.

6h.p. J.A.P. Combination, perfect; any trial.—Abram, Hoole Lane, Banks, near Southport. [5555]

8h.p. J.A.P. Combination, 2-speed, Bosch, B.B., good condition; bargain, £55.—33, Wiltshire Rd., Brixton. [5490]

J.A.P. 8h.p. Combination, 3-speed Jardine gear box, kick starter, engine run 200 miles, rest machine new, Corvette sidcar; £90; evenings.—51, Upton Lane, Forest Gate, E.7. [5572]

1914-15 Star Jap. 6h.p., powerful twin, countershaft, 3-speed, clutch, kick start, been stored 3 years, new condition; 75 gns.—Speechley, 1, Gunnersbury Lane, Acton Hill. [5660]

J.H.

6h.p. J.H., Sturmer countershaft gear, complete; £73.—Cross, Eppingham Sq., Rotherham. [X5495]

Levis.

LEVIS.—Order now for earliest deliveries of 1919 models.—Longman, Fisherton St., Salisbury [2358]

LEVIS.—Early delivery of Popular models.—G. W. Wilkin and Co., sole agents, Hunters Bar, Sheffield. [5610]

1916 2½h.p. Levis, fully equipped, not run 500 miles; £52, or near offer.—Tickler, Brathay Park Rd., Teddington. [5350]

LEVIS, Popular model, single-speed, nearly new; £33.—Earls, The Vale, Hampstead. Phone: 3287 Hamp. [5678]

A BARGAIN.—Late 1915 Levis Popular, countershaft, 2-speed model, perfect condition; £30.—Griffiths, Craven Arms, Shropshire. [X5409]

LEVIS, 1914, 2½h.p., 2-speed, enamelled grey, Bosch, Senspray, new Dunlop, had little use; £29.—Write, Rords, 56, Station Rd., Sidcup. [5712]

LEVIS.—For the earliest possible deliveries of 1919 models, specifications, and prices, sole district agents, The Walsall Garage, Wolverhampton St., Walsall. Phone: 444. [4670]

RIDER TROWARD and Co., 31, High St., Hampstead.—Levis. Delivery this month, Model E, 2-speed, clutch, £47/10; Popular, £38. Orders being booked in strict rotation. [2268]

1915 Levis, 2½h.p., 2-speed, chain-belt drive, Bosch mag., Dunlop tyres, excellent condition, mechanical horn, head lamp, generator, and tools.—69a, Hambalt Rd., Clapham Common, S.W.4. [5556]

Matchless

MATCHLESS, early deliveries.—Sole Agent, J. A. Stacey, 12, Ecclesall Rd., Sheffield. [X1544]

5-6h.p. Matchless-J.A.P., 3-speed gear, new condition; bargain, £54.—125, Canal Rd., Mile End. [5589]

MATCHLESS Combination, new August, 1918, spare wheel; £130.—Flint, 17, Station Rd., West Croydon. [5310]



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MOTOR CYCLES FOR SALE.

Matchless.

CROW Bros., High St., Guildford, West Surrey agents for the 1919 Matchless. Order now to ensure early delivery. [1552]

RIDER TROWARD and Co., 31, High St., Hampstead.—Matchless. Earliest delivery Victory model combination, £140. [2269]

MATCHLESS, 8h.p., 2-speed, coachbuilt sidcar, ride away; bargain, 28 gns; seen after 6.—42, Templeheen Rd., East Sheen. [5646]

MATCHLESS 8h.p. 2-speed Combination, lamp, horn, splendid condition; £65.—2, Barrington Villas, Shooters Hill, Woolwich. [5640]

8h.p. Matchless Combination, 1914, mechanical horn, speedometer, everything on; smaller power wanted; offers.—99, Shaftesbury Rd., Hammersmith. [5401]

MATCHLESS, 6h.p. J.A.P., 1914 racing machine, torpedo sidcar, disc wheels, lamps, horn, tools, etc.; £50.—Lunn, 32, Welidon Crescent, Harrow. [5347]

MATCHLESS Combination, 1915, M.A.G. engine, 3-speed, kick start, speedometer, apron, grid, petrol carrier, etc.; £110.—Melrose, 1, Kenloe Rd., Tooting. [5375]

MATCHLESS, 1919 Victory model, delivery this week; £140; can we book you orders? don't miss it.—Clapham (Motors), King George St., Greenwich. [X5526]

1915 8h.p. Matchless, M.A.G., electric, 2-seater C.B. sidcar, 3in. tyres, not used 15 months, perfectly and fully equipped.—33, Ravensdale Mansions, Crouch End, N.E. [5325]

MATCHLESS 8h.p. Combination, hood, screen, new oversize tyres, as new; 128 gns.; exchanges.—Geo. Smith, Motor Cycle Depot, Clapham Junction (opp. Ardington and Hobbs). [X5403]

WALBRO Motor Works, Ely, Cambs.—Matchless 1912 combination, 6h.p. twin J.A.P., 3-speed hub, new Dunlop tyre back wheel, Canoelet sidcar, hood, screen, tools, all in good order; £55. [X5314]

MATCHLESS, Victory model combination, actually in stock, with spare wheel and tyre; £140. Liberal allowance for 1914-1916 Matchless, M.A.G. models.—Tassell, 1a, Bloomfield Rd., Plumstead. [X5059]

Metro.

METRO-TYLER.—Immediate delivery of this sporting lightweight, 2½h.p., single-speed £46, 2-speed £52.—Sole wholesale and retail agents, Lancashire and N. Cheshire, The Brook Motor and Engineering Co., 308, Deansgate, Manchester. [5358]

RIDER TROWARD and Co., 31, 40b, and 78, High St., Hampstead, sole agents for the Metro-Tyler 2½h.p. 2-stroke for London, Middlesex, Essex, Hertfordshire, Surrey, Sussex, Kent, and portions of Berkshire and Buckinghamshire; immediate delivery 2-speed model £52, single-speed £46; demonstration model in stock. Trade enquiries invited and district agencies arranged. [3601]

Minerva

3½h.p. Minerva, 1912, Bosch, H.B., laminated forks, 32" Mabon gear, lamp, spares, stored during war, £25; sidcar for same, torpedo cane, £6/10.—Newton, 6, Caverswall St., Shepherd's Bush, W. [5399]

Motococche.

MOTOSACOCHE 2½h.p. Lightweight, in sound order and re-enamelled, been stored 4 years; bargain, £15.—Motors, 32a, Portland St., Brighton. [5532]

MOTOSACOCHE, 1912, 2½h.p., variable gear, lamps, pump, speedometer, tools, spares, running order; £15, no offers.—H.J.W., 8, Montpelier St., Brighton. [5661]

MOTOSACOCHE, M.A.G., 1915, 3½h.p. twin, T.T. bars, footrests, de Lissa valves, lamps, horn, and generator, Enfield 2-speed, condition very good.—16, Holmwood Gardens, Church End, Finchley. [5295]

New Comet.

NEW COMET, fitted 5h.p. twin Penscot engine, mechanically sound, tyres perfect; £18/10.—Seymour, 6, Riosstead Rd., Catford. [5426]

NEW Comet, new 1918 (August), 6-8h.p. J.A.P. engine, Sturmer-Archer 3-speed countershaft gear with clutch and kick starter, electric lighting set, special T.H. bars and low exhaust pipe, complete set of tools, etc.; this machine is exceedingly powerful and fast, and, having only run 200 miles, is in absolutely perfect condition; price £80; can be seen any time.—Rupert House, Stone Grove, Edgware. [X5436]

New Hudson.

New Hudson, 2½h.p., 2-speed, 1915, excellent condition.—Bray, 3, Milton Rd., Highgate, N. [5470]

New Hudson, 3½h.p., 3-speed, pedal start, speedometer, sidcar; £48.—29, St. Leonard's St., Bromley-by-Bow. [5544]

3½h.p. 1914 New Hudson, 3-speed, clutch, coachbuilt sidcar, etc.; bargain, £36/10.—White, Frimley, Surrey. [5660]

NEW Hudson Combination, 3½h.p., 3-speed, good tyres, lamps, just overhauled; £40.—71, Pelham Rd., Wimbledon. [5553]

NEW HUDSON, 2½h.p., 1915, excellent condition, stored 2 years; £24, or offer.—Hammond, Millgreen, Spalding. [X5464]

MOTOR CYCLES FOR SALE.

New Hudson.

NEW Hudson, 2½ h.p., 3-speed, kick start, clutch, good tyres and condition; £25.—Gorvendale, Blith Rd., Belvedere, Kent. [5333]

NEW Hudson 1914 3½ h.p., 2-speed Clutch Combination, been stored 2 years; £45.—Cox, 24c, Edgington Rd., Streatham. [5617]

NEW Hudson Lightweight, 2½ h.p. J.A.P., 3 speeds, clutch, nearly new; £32.—48, Ravenslea Rd., Wandsworth Common, S.W. [5573]

NEW Hudson, 1914, 3½ h.p., chain-cum-belt, 3 speeds, clutch, kick start, accessories, any inspection or trial.—Cooper, 6, Caple Rd., Harlesden, N.W. [5460]

FOR Sale, 1914 2½ h.p. New Hudson motor cycle, 3-speed, clutch, kick starter, splendid condition throughout; £32/10, no offers.—Norman White, 87, High St., Banbury. [X5361]

NEW HUDSON 6h.p. 3-speed Combination, 1914, small mileage, just overhauled and re-camelled throughout, outfit absolutely as new, lamps, wind screen, etc.; £75.—Box 3,044, o/o The Motor Cycle. [X5546]

1915-16 2½ h.p. New Hudson, De Luxe model, 2-stroke, 2-speed, horn, mirror, tools, tyres unpunctured, mileage 1,500, plating, enamel, and mechanism perfect; seen Saturday afternoon or Sunday; £32.—73, Crickleade Av., Streatham Hill, S.W. [X5529]

New Imperial.

NEW Imperial-Jap, 2-speed, good condition; bargain, £33.—39, South Parade, Oxford. [5579]

CROW Bros., Guildford.—New Imperial, all models, new and overhauled second-hands stocked. [9778]

RIDER TROWARD and Co., 31, High St., Hampstead.—Immediate delivery New Imperials. [5604]

NEW IMPERIAL-J.A.P., 2-speed, perfect order; £27.—Gillam, Woodland Place, Bathwick Hill, Bath. [X5185]

NEW Imperial.—All models for immediate delivery.—J. A. Stacey, Sole Agent, 12, Ecclesall Rd., Sheffield. [X1545]

1919 New Imperial, 2½ h.p., 2-speed, only ridden 150 miles; £46.—67, Little Heath, Old Charlton, S.E.7. [5511]

NEW Imperials, sole London agents.—2½ h.p. 2-speed 1919 models in stock; trade supplied.—Reys, Euston Rd. [2973]

NEW IMPERIAL, 1915, 2½ h.p., 2-speed, in good condition; £26, or nearest offer.—Knight, Sewardstone, Chingford. [X5413]

NEW Imperial J.A.P., 1916, 2½ h.p., 2-speed, clutch, kick starter, lamps, first-class condition, only done 300 miles; 37 gas.—Rose's Garage, Uxbridge. [5491]

NEW IMPERIAL-J.A.P., 2½ h.p., 2-speed, free engine, practically new, done less than 100 miles; £45; view evenings.—Atter, Bank House, 150, High St., Stoke Newington, N.16. [5359]

1918 New Imperial, 2½ h.p., 2-speed, M.A.G. engine, just overhauled, not done 500, condition as new, semi-T.T. bars, lamps, horn, etc., tyres perfect; £45.—L, Manor House, Steeple Ashton, Wilts. [X5407]

Norton.

CROW Bros., High St., Guildford, Norton agents; let us reserve you one. [5301]

NORTONS.—For quick deliveries try the sole Manchester agent, Tom Davies, 229, Deansgate, Manchester. [4426]

NORTON.—We hold large contracts, and can give earliest delivery.—G. W. Wilkin and Co., Hunters Bar, Sheffield. [5611]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new Nortons. [2266]

NORTON.—We are sole District Agents, and can give you earliest possible deliveries.—Loogman Bros., 2, King's Parade, Acton. Phone: 1578 Chiswick. [5595]

NORTON 1918 Big 4, military model, lamps, mechanical horn, speedometer, condition perfect, mileage 2,250; £95.—Moore, Ivy House, Weaverham, Cheshire. [X5585]

NORTONS.—We are now booking orders for the latest model Norton solo and sidecar outfits; £5 deposit; deliveries in strictest rotation.—Maudes, 100, Gt. Portland St., London, W.1. [5675]

N.S.U.

N.S.U., 3½ h.p., 2-speed, free engine; £25.—272, Green St., Upton Park, E. [5629]

N.S.U. 6½ h.p. Combination, 1912, 2-speed and clutch, Bosch, 3 lamp sets, 2 horns, speedometer, in perfect condition; £38.—East View, Station Rd., Harlington, Middlesex. [X5469]

BARGAIN.—N.S.U. 1914 twin 6h.p. combination, coachbuilt sidecar, 2-speed gear, free engine, spring frame, Bosch mag., electric light, excellent condition; £60, or offer; cash wanted.—27, Shelton Rd., Merton Park Estate, S.W.19. [5519]

N.U.T.

N.U.T., 4h.p. twin, overhead, T.T., very fast, as new; £57/10.—Longney, 5, Gittin St., Oswestry. [X5545]

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N.U.T., 2½ h.p. T.T. twin J.A.P. engine, 1914, single geared, stored away 3 years; £30, or near offer.—Austin's Garage, Hoddesdon, Herts. [5482]

WALBRO Motor Works, Ely, Cambs.—N.U.T. 1914 3½ h.p. twin; this machine is all in excellent order, speedometer, lamps and horn, original tyres good, tools, etc.; £39/10. [X5315]

RIDER TROWARD and Co., 31, 40b, and 78, High St., Hampstead, sole agents for the N.U.T. 3½ h.p. twin 3-speed, dynamo lighting, for the whole of London, Middlesex, Essex, Hertfordshire, Surrey, Sussex, Kent, and portions of Buckinghamshire and Berkshire. Orders now being booked for earliest delivery, and district agencies arranged. [3602]

O.K.

O.K.-J.A.P., 2½ h.p., 2 speeds, countershaft, fast; £32.—211, Garratt Lane, Wandsworth. [5602]

RIDER TROWARD and Co., 31, High St., Hampstead.—O.K. Orders being booked for earliest delivery. [2271]

O.K., 1916, 2½ h.p., 2-speed, good going order, complete with lamps; £25.—Lieut. Rayer, Castle, Monmouth. [X5519]

O.K. Juniors. Delivery promised March. Book immediately. All machines personally tuned.—Morton, Motors, Dorking. [5600]

1915 O.K., 2½ h.p., 2-speed, good condition, carefully used; £25.—F. Charles, Newhouse, Northiam, Sussex. [5412]

O.K., 2½ h.p., 2-speed, new back cover and tube, good order; £26/10.—1, Ward's Terrace, Broad Lane, Tottenham. [5715]

1917 O.K. Junior, 2½ h.p. J.A.P., Dixie magneto, Amac carburetter, 2-speed countershaft gear, chain-cum-belt, T.T. bars, cast aluminium footboards, 2 lamps, Lucas horn, plating and enamelling perfect, machine hardly used; 33½ gns.—Seea, 18, Park Av., Northend Rd., Golder's Green. [5303]

P. and M.

P. and M., first-class running condition, fully equipped; £28.—Bunting, Masous Av., Wendstone. [5620]

LATE Model P.M., as new, countershaft gears; £45/10.—R., 5, Victoria Av., Surbiton. [X5547]

P. and M., 3½ h.p., 2-speed, chain drive; £19/19.—Collier's Motories, Union St. South, Halifax. [5425]

P. and M., 3½ h.p., late 1913, carefully used solo P. since new, excellent condition; price £40.—Box 3,040, o/o The Motor Cycle. (D) [X5493]

P. AND M., 1919, 3½ h.p., 2-speed model, and sidecar, in stock; £102.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green, N. [5446]

P. AND M., 1915, 3½ h.p., 2-speed, kick starter, and coachbuilt sidecar, complete with lamps, horn, electric lighting, ready for the road; 75 gas.—Burdett, 15, Waldemar Av., Ealing, W.13. [5414]

P.F.

P.F., 2½ h.p., Bosch, Brown and Barlow, good running order; £20.—1, Ward's Ter., Broad Lane, Tottenham. [5714]

Precision.

4½ h.p. Precision, C.B. sidecar, good condition; bargain, £32.—4, All Saints Rd., Westbourne Park, London, W. [X5369]

PRECISION, 4½ h.p., Sept., 1914, Brampton gear, in new condition; £55, or nearest.—H. Jackson, Rockland All Saints, Norfolk. [5370]

Premier.

DAN GUY, Weymouth.—Premier, 3½ h.p., 2-speed gear; £25. [5687]

PREMIER, 3½ h.p., clutch, late model, nice condition; £32.—211, Garratt Lane, Wandsworth. [5604]

PREMIER, 7-h.p., 3 speeds, countershaft, Swan sidecar; £75.—211, Garratt Lane, Wandsworth. [5605]

PREMIER, 3½ h.p., 3 speeds, clutch, coachbuilt sidecar; £40.—211, Garratt Lane, Wandsworth. [5606]

PREMIER, 3½ h.p., 3-speed countershaft, coach combination, as new; £65.—29, St. Leonards St., Bromley-by-Bow. [5539]

PREMIER, 1914, 3h.p., Bosch, Grado, good tyres, B. and B., as new; bargain, £30.—15, Mervan Rd., Effra Rd., Brixton. [5580]

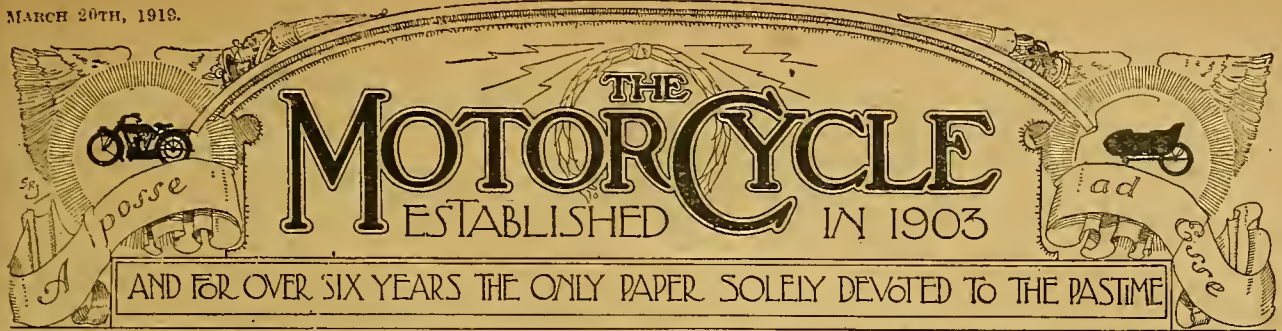
PREMIER, 3½ h.p., 3-speed, clutch, speedometer, lamps, tools, perfect running order; £30.—157, Brixton Hill, S.W.2. [5475]

PREMIER 3½ h.p. Twin, 2-speed, light wicker sidecar, engine overhauled makers, perfect condition; £35.—Hammond, High St., Wivenhoe. [5561]

PREMIER, 3½ h.p., 1914, countershaft, complete with Canoelet coachbuilt sidecar, luggage carrier, wind screen, storm apron, speedometer, and electric lighting, in good order; 55 gas.—Turner, 6, Balfour Rd., Acton, W.3. [5600]

Quadrant.

QUADRANT Combination, 1913, 4½ h.p., Armstrong 3-speed, clutch, sound condition, ride away; £35.—M., Clock House, Carshalton, Surrey. [5512]



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Cast off the Fetters!

IT is very difficult at the present time for those not in the heart of the movement to gauge the widespread influence of the motor industries on the national life.

The time has now come when those who so loudly decried the value of motor vehicles to our existence as a nation are feeling the loss of the support of the opinion of an uninformed public. The daily press has had the truth forced home to it by the indisputable value of motor vehicles in war, and it is beginning to acknowledge their invaluable aid in times of peace. And even those papers whose former attitude with regard to motor cycles was one of opposition based on ignorant prejudice are beginning to take a more enlightened interest in this most useful means of locomotion, though in some cases their interest seems to take the form of somewhat enthusiastic reference to the more freakish examples of motor cycle construction.

To consider the question purely from the viewpoint of the motor cycle, in gauging the probable state of future markets for these machines, we must take into account the numerous fresh sources of potential motor cyclists, such as those of both sexes, who have been introduced to the petrol engine in the Services, and home transport organisation. Many are the schools of motoring which have sprung into being, but there is a more potent recruiter of good opinion than these. For four long years the public has had dinning into its mind by ear and eye, by hearsay and observation, that this is the mechanical age, and that the supreme and most useful mechanism to all alike is the internal combustion engine—whether it be adapted to the R.A.F., lady driver's mount, the officers' car, the aeroplane, the caterpillar tractor, or the tank. And the result is that the public have begun to think about it, and later will recognise the possibilities of its future, if they have not done so already. Then it is but a step to pondering over the possible benefit to the

individual. How can he take advantage of it? "The motor trade has a big future," he says, "I'm too old to dabble with it now myself, but I'll put my boy into it."

War-time Appreciations.

Then there is the man who has donned khaki. In battered France and muddled Flanders he has come into daily contact with the automobile in some form or another—in fact, his life has often depended on it. Moreover, *The Autocar* Schools in neutral countries for interned men of the Forces have evidenced the popularity of the subject. The Government has even gone so far as to arrange for training in mechanical transport subjects; classes have been founded in most of our big cities, both at home and in the colonies, and the leading firms have wisely developed training systems in their own factories. The latest news is that the Government is considering the granting of State assistance towards the training of young engineers.

All these things are true and recognised, yet in an enlightened and supposedly progressive country the man who makes these things possible is the man selected for the imposition of the most unfair, ridiculous, and old-fashioned legislation ever tolerated. Is it not time to end it? Soon *millions* will depend upon the evergrowing industry for a livelihood. If they are not to be disappointed the industry must be unhampered. To-day is the time when unity of action is extolled. The trade and the public are united by mutual representatives to secure a measure of reformation in many things concerning motordom as a whole. Let them make a clean sweep! and hack and cut with resistless energy till the manufacturers and the people are free of every impeding fetter. Then, and not till then, can we look forward to a future of commercial success which will not only benefit the man who produces motor vehicles and the man who uses them, but all without class or distinction—and that is true prosperity.



The A.C.U.

I READ Major S. R. Axford's article on the A.C.U. with much interest. Its commonsense, its enthusiasm, and its optimism were all very taking. What strikes me about the A.C.U. is that it necessarily appears before the public in a white sheet, because it has a past of sorts to live down. In the old days its main work was the organisation and control of competitions, in which the bulk of riders were not interested. It signally—though perhaps inevitably—failed to protect us from the rapacity of petrol trusts, the persecution of any police authorities who chanced to be malicious, and the callous cynicism of Parliament. The consequence was that the average provincial motor cyclist was bored stiff with the A.C.U. and its claims. At the annual meeting of his club he got on his hind legs and pointed out that the club got no very obvious *quid pro quo* in return for its affiliation fees; practically every club secretary had to stand this racket, and defence of the A.C.U. was not too easy. Personally, I always felt that it accomplished just about as much as was possible in the way of political and public action, whilst its trials were tolerably well run, and such shortcomings as they exhibited were due rather to the power of the trade than to the weakness of the committee or officials. After all, the R.A.C. is an infinitely more powerful body, and was equally helpless in the face of police traps, asinine speed limits, petrol profiteering, and other injustices under which private motorists labour. Still, the fact remained that the benefits were rather nebulous, the subscriptions tangible, and the value of membership not easily demonstrable.

The officials have done wisely in working out one benefit which touches every potential member—the “get you home” scheme. If on the top of that they can offer the provincial member a little genuine assistance in legal matters, they are sure of a membership which will give them a real position as our representatives, and also furnish the sinews of war. Afterwards, in conjunction with the R.A.C. (which also seems to be waking up) and the Parliamentary motor-ing committee, they may manage to procure us rather better treatment at the hands of the law and the police and the fuel syndicates. If these ideals are to materialise, the A.C.U. needs three things: (1) A “live” committee, (2) a thumping membership, and (3) plenty of money. Let us all back it up; and if it lets us down again, we will deal faithfully with it in say, two years' time.

Club Rooms.

I ALWAYS wonder that so few towns boast a club room for motor cyclists, and the A.C.U. may see its way to organise such rooms. If you are a Mason or a Forester or an Oddfellow or a commercial traveller or a bookie, you are never at a loss for a pleasant evening in a strange town. If you are a motor cyclist, you arrive in a strange place, and there is

nothing to be done except to soak in a local bar, or give the promenading shop girls a treat, or wander dolefully about gazing at church spires until it gets dark and cold and you return to your inn. The pity of it is that you are probably quite red-hot about your hobby, and bursting with ideas after an aggravating day in bad weather with a dud mount or a topping run on a good one. Hidden somewhere in the town are umpteen other fellows, all equally keen, and enjoying nothing better than an evening's “shop.” But you cannot get together anyhow. Now the rent and furnishing of a room are not expensive. You can often hire such a room over a garage, with a telephone handy to ring up the club secretary. I am not thinking of the cosy quarters, complete with bar, which such clubs as the Edinburgh M.C.C. run; for something much simpler would fill the bill.

Propaganda Work.

OR take propaganda work. During last winter the Aeronautical Society ran a series of magnificent lectures on various aspects of aviation in some of the leading munition centres. Motor cycling clubs usually languish a little in winter time, as many riders are fair weather birds. The old A.C.U. membership included dozens of men who were capable lecturers: some of them were racy *raconteurs*, some were technical experts, etc., etc. At small expense the A.C.U. could provide most of the provincial clubs with a monthly lecture during the “off” months. The army has made us all more “clubbable” than we used to be. There is an infinite variety of topics to select from. Lots of the provincial riders never go to the shows or the Six Days or the T.T., and would appreciate a lively talk on them from a man who is an authority. The D.R. and M.T. men from various fields of war could furnish excellent evenings' entertainments. There is no reason why aviation and submarine work should not be dragged in—they touch mechanical interests which are akin to our own. Plenty of men would tackle such jobs for railway fare and hospitality without fees. To put it in a nutshell, the A.C.U. can never do justice to its political duties unless it has the clubs and the individual riders behind it: and it cannot gather them in merely by organising a couple of annual competitions, writing dignified letters of protest to the Home Secretary, and towing lame dogs to the nearest garage free of charge.

Tiny Carburetters.

I HAVE often wished that some technical expert would publicly discuss the design of microscopic carburetters. I am merely a practical rider, and wholly unqualified for handling the subject. But all my road experience suggests that wee carburetters are peculiarly liable to “flood.” If I buy a car with a gasometer type of carburetter, I know it will never flood till the needle wears. If I buy a motor cycle of 500-1,000 c.c. I may get occasional flooding as the

Occasional Comments.—

result of vibration, e.g., when a semi-balanced engine is doing 2,000 r.p.m. on a low gear; in the course of time the needle will wear: there is (probably) no filter, and flooding will occasionally result from dirt on the needle valve seating. Nevertheless, flooding will be the exception, not the rule. But if I buy a tiny two-stroke with a float chamber section resembling a penny, I am sure to experience a great deal of flooding, even with a perfectly pointed needle and a clean seating: how far it is due to the vibration of an engine which has a wart on its piston, how far it is ascribable to small petrol flow and quick float action, how far the blame should be put upon other factors is unknown to me.

A New Competitor ?

TO-DAY I realised with a start that the costlier motor cycle outfits, the cycle cars, and the cheaper cars may soon have to reckon with a formidable rival. I was shown a photograph of a "private owner's" aeroplane. It differed widely from the £800 machines with 80 h.p. engines which certain newspapers, which have gone off the deep end on civilian aviation, have depicted. It was a tiny monoplane fitted with a flat twin motor cycle engine, and reminded one, in its general conception and dimensions, of the quaint little turf-hopper on which Santos Dumont used to scuttle round aerodromes in the days of Cody and the Hon. C. S. Rolls. This aeroplane is going into early production to sell at £200, even in these days of expensive materials and high wages. Nor is it made by Henry Ford. Moreover, the price includes a kit of likely spares.

From the expenses of such a purchase to a side-car's annual bill may be a far cry at the moment. But things move fast. This is a far simpler production job than the Ford car, which has been sold in its country of origin at £75, and may be sold at less some day. The crux of extensive landing and rising grounds may be solved. Garage is simple. Here is a possible picture:

A man of Ford's mental calibre concentrates on the popular aeroplane, and sells it at £75 eventually. It uses four gallons of fuel per hour, and covers a hundred miles. You take off and alight on sidings

abutting on the new high-speed motor roads, which must arrive sooner or later. To store the 'bus, you unhook the wings, and halve a jointed fuselage, packing the whole concern in a space little larger than a cycle shed.

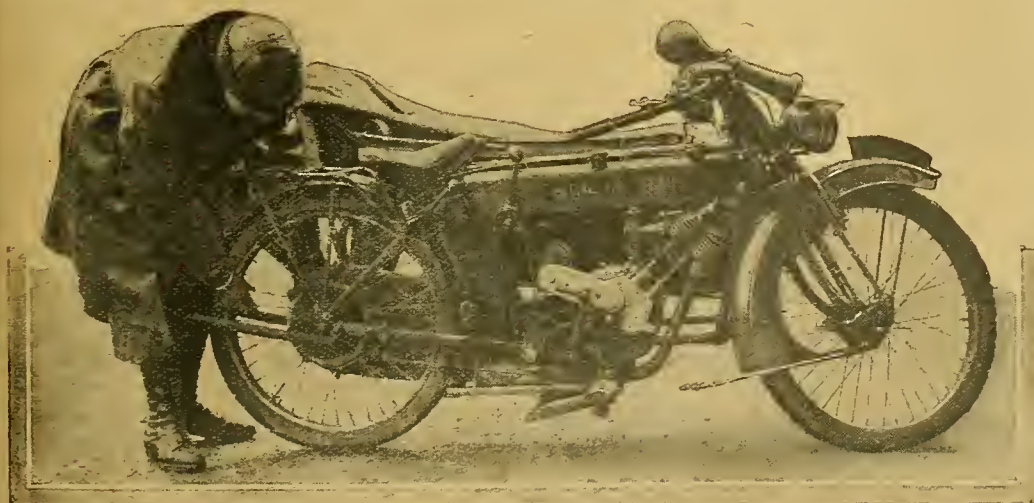
Industry is certainly heading towards giant production by super-manufacturers, and squeezing out the small-minded and inefficient men.

The Farmer's Motor Cycle.

I SPENT my last leave in an agricultural county, where the average acreage held by each farmer is well under a hundred, and even the profiteers do not run to motor cars. At the same time the local transport system is just about as prehistoric as survives anywhere in Great Britain. The anti-joyride restrictions were then in force, and I travelled from 8 a.m. to 7 p.m. in a variety of conveyances invented by Noah in order to spend an hour with a man who lived precisely nineteen miles away. When I had blown off steam on my return, I enquired what transport the residents employed. The local motor cycles were all of the British twin-cylinder s.c. variety. I interviewed several intelligent owners, and they taught me some new swears which would have brought unction to my soul at the end of my own thirty-eight miles in eleven hours. First and foremost, they cursed nickel plating more heartily than a mediæval inquisitionist ever cursed a Protestant. Not because it rusted. They cared nothing for appearances. But because it prevented the bicycle from selling when they tired of the old mount, and hours in pouring rain under hedges had turned its bar, hubs, bolts, etc., a speckly saffron. Secondly, they cursed the sidecar, its shape, dimensions, finish, splinterability, dintability, everything about it. And no wonder, for they had used these fine Coventry-built coachwork sidecars to carry calves, pigs, lime, manure, seed potatoes, firewood, sulky bits of binders and harrows, and other impedimenta. Sidecar designers, please note that the agricultural sidecar must be roomy, afford a comfortable seat for the best girl or wife on gala days, and yet accommodate the maximum load of farmhouse cargo on demand. Whether it can be done with one body, or whether two rapidly interchangeable bodies are needed, deponent knoweth not.

BAFFLING THE MOTOR CYCLE THIEF.

Owing to the large number of Government cars and motor cycles lately stolen, all drivers are supplied with a padlock and chain, which has to be used whenever the machine is left unattended. The motor cycle to which a W.R.A.F. is seen fixing the lock is a P. and M



IMPROVING THE MOTOR CYCLE.

The Best Solo Machine Specification in the Suggestions Competition invited in Connection with our "Which Type" Referendum.

THE suggestions for improvements in details of motor cycle design received in connection with the "which type" referendum are many and varied, and range from mudguarding to valve operation, many readers putting forward similar ideas, so that the segregation of the winners has been more than a little difficult. The chosen suggestions, however, embody most of the principal features asked for by the majority in addition to fresh ideas. The winner of the solo class is Capt. R. de H. Haig, R.A.F., Chattis Hill, near Stockbridge, whose specification is as follows:

FRAME.—Treated with real anti-rust dull black finish, nuts coppered and nickel-plated or black. Straight tubes as on the A.J.S. Long steering head; great attention paid to angle of rake, as this affects skidding tremendously. Good sized oil holes to steering head bearings.

WHEELS.—Both wheels quick detachable, interchangeable if possible; if not, P. and M. type front, Lea-Francis type back; very heavy gauge spokes, as on James; Rudge type spokes; Roman rims; at least two security bolts; if satisfactory, Sankey type wheels, are preferable.

BRAKES.—Rim type front and back, carefully designed as on Lea-Francis.

HUBS.—Must be mudproof and should have no oilers and have roller bearings or self-aligning ball bearings.

STANDS.—Back stand extra strong, spring up; must not interfere with wheel removal; front stand under engine, and act as undershield, as on Lea-Francis.

MUDGUARDS.—Front guard as on Enfield, only much stronger at supports and packed to prevent rattling; all bolts locked up with locknuts or

patent nuts. It should have non-drip edges and plenty of clearance; back mudguard with valances all round, but must give in. at least each side of tyre clearance, and be quickly detachable as on Enfield; both guards galvanised or anti-rust treated; back mudguard should have an extra stay at rear end.

FORKS.—Brampton biflex type, with long bushed bearings adjustable to take up side play, screw-down lubricators of a good size.

HANDLE-BARS.—Adjustable, as on Indian, different patterns provided to suit customers.

CHAIN CASES.—Quick detachable, Lea-Francis front case clips for both cases, and of stouter construction.

TANK.—N.U.T. type, rounded with straps, I.O.M. T.T. Rudge filler caps, petrol filter inside cap and in petrol pipe.

TOOL KIT.—Carried on top of carrier in flat wooden box, with recesses to take each tool.

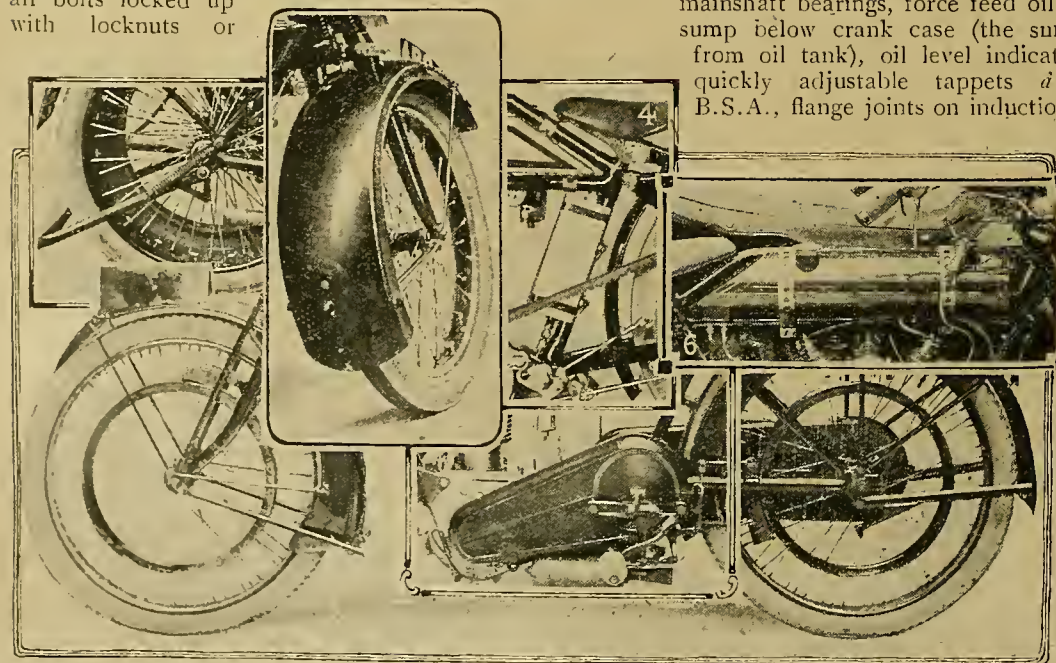
FOOTRESTS.—Or boards, optional; both should be adjustable. Triumph rests are very good. There should be a splashguard like the A.J.S. on footboards.

SADDLE.—Leaf spring Brooks.

SPRINGING.—Some form of rear spring is essential. Saddle pillar or front down tube used as oil reservoir, as on the Scott. All bolts should be keyed as on Triumph, and where possible like the Scott cylinder holding-down bolts.

BACK WHEEL ADJUSTMENT.—By push bolts instead of pull, and of ample size.

ENGINE.—Outside flywheel V twin, flat or single, detachable cylinder heads, as on Blackburne, split or roller big end bearings, roller or self-aligning ball mainshaft bearings, force feed oil to all bearings from sump below crank case (the sump fed by birdfeed from oil tank), oil level indicator on side of tank, quickly adjustable tappets *à la* Isle of Man B.S.A., flange joints on induction pipe, which should

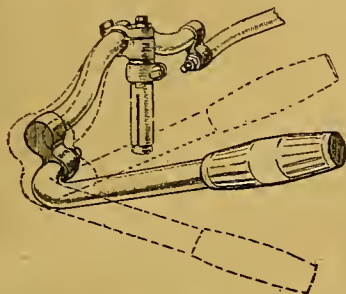


Details mentioned by Capt. R. de H. Haig in his specification as being very desirable features

- (1) The Rudge spring-up stand.
- (2) The Lea-Francis front brake.
- (3) Royal Enfield front guard.
- (4) Oil tank on seat tube.
- (5) Lea-Francis front chain guard.
- (6) N.U.T. tank.
- (7) Lea-Francis rear brake.

Improving the Motor Cycle.—

have a hot air muff, side-by-side valves with bolted down valve cap for both valves (three or four bolts). Exhaust pipe should be kept in place by clip joints. Magneto behind engine *à la* Clyno, chain-driven, and in same chamber as timing pinions. This chamber should be separate from crank case proper, and running in an oil bath.



The Indian adjustable handle-bars.

Crank case release of diaphragm type, and sufficiently large to maintain partial vacuum in crank case. Driving pinion on crank-shaft fitted as in White and Poppe engine, *i.e.*, dogs on pinion engage in recesses in shoulder on shaft and kept *in situ*

by a nut on the end of the shaft. Gudgeon pins should be held by spring washer, as in B.S.A.

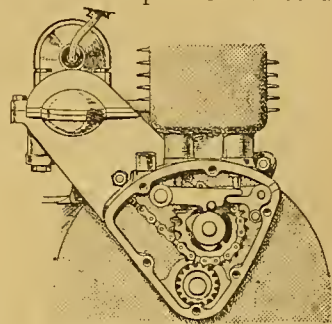
PISTON.—Aluminium, and deeply recessed. Exhaust valve lifter should be an internal cam, as on Triumph, and, above all, a clean crank case. As far as possible, no cheese-headed screws. If the conventional internal flywheels are used, crank pin should be keyed, cone and nut on driving side, cone and nut on timing side. Further, holes should be drilled

through both flywheels opposite crank pin, and taking standard engine bolt for truing.

GEAR BOX.—Drive from engine by silent chain, to rear wheel by oversize chain. Gear box adjustable by eccentric method as on Lea-Francis, so that gear adjustments would not be altered. Gear levers *à la* 3½ h.p. twin James or like Triumph. Clutch control *à la* Sunbeam, *i.e.*, very light on handle-bar, three or four gears, all bearings to be ball bearings mounted in brass bushes when the gear housing is aluminium.

CLUTCH.—To be dry plate with easily adjustable spring tension. Kick starter to have internal teeth.

Finally, all Bowden controls should be easily detachable *in toto* from machine; this can be done by judicious saw cuts in terminals. They should be internal in handle-bar. All levers should give a straight pull as on Amac controls. The H.T. wires should be led through ebonite tubes to plugs. There should not be more than three sizes of nuts or bolt heads—say ¼ in., ⅜ in., ½ in., and of the same standard threads.



Magneto chain case integral with the crank case, as in the Star motor cycle.

Selective Clutch Gears for Lightweight.

An Appeal for Simplicity and Foolproofness.

THE writer is very much in favour of selective clutch gears on the lines of the P. and M. and Enfield for lightweight machines, and certainly it seems that a heavy gear box is out of place, apart from the question of cost, on these little mounts. In the first place, the essence of the lightweight is foolproofness and simplicity, and the selective clutch gear affords the most foolproof transmission possible. When old it is not good for the heavier types of vehicles, and it works at its best and sweetest when not overloaded; so that its wearing properties are practically indefinite when it is applied to this type of mount.

A gear box, besides being costly, adds complications, and robs the machine of its essential simplicity. For it to work satisfactorily a friction clutch must be used in addition, which means an additional unit and an additional control. The lightweight clutch must be small and light, and small clutches are not always very good. If the clutch is dispensed with the transmission is far from being foolproof, and the machine far from what might be desired in the way of controllability. I have possessed lightweights having the "simple" dog-clutch change, which were more difficult to handle than a 40 h.p. car, and similarly I have seen such machines in the hands of inexperienced riders perform all sorts of acrobatic feats, such as rearing up vertically on their hind wheels. It is surprising what the gear boxes will put up with, though such abuse is painful to experience and behold.

A lightweight machine should be such that any novice, who has had no previous experience, can handle it straight away without difficulty. I am in favour of the chain-cum-belt drive on these light mounts on account of its sweetness, cleanliness, and simplicity, and with a selective clutch gear it makes an excellent combination; but there is no reason why, given a good selective clutch gear, an all-chain drive should not be employed without the necessity for a shock absorber. At all events, a cush hub is all that is required for damping out the snatch should chains be employed, and the all-chain Levis with Enfield transmission system is a sweeter running mount than many of its belt-driven comrades; whereas, given an absolutely positive drive, as when a gear box is employed, some additional shock absorber is required, its need being felt chiefly when starting up from cold.

Effective Flywheel Weight.

Again, these small engines are apt to attain terrific revs. almost in the fraction of a second when the load is suddenly relieved by placing the lever in the free position, and one proceeds through traffic with the engine alternately racing and konking unless it is well tuned. This kind of thing is very rough on a gear box, whereas a selective clutch gear, judiciously handled, can be so manipulated as to keep a progressive load on the engine. Also, since the engagement of the gear is always more or less progressive, stresses on engine and machine are lightened.

CHINOOK.

CURRENT CHAT

Times to Light Lamps.

GREENWICH TIME

Mar. 20th	...	...	6.40 p.m.
" 22nd	...	...	6.44 "
" 24th	...	...	6.48 "
" 26th	...	...	6.50 "

Police Activity.

We are advised that the police are particularly active on the roads in the neighbourhood of Wanstead and Woodford, Essex.

Auto-wheel Car Races.

The proposed (?) T.T. for scooters has its parallel at Palm Beach, Florida, where American society ladies race with small four wheel "cycle cars" propelled by auto-wheels. These little vehicles are known as "Smith Flyers."

The Industrial Reconstruction Council.

A conference on "Industry and Educational Reconstruction" will be held under the auspices of the Industrial Reconstruction Council on Tuesday, March 25th, at 6 p.m., in the Hall of the Institute of Journalists, 2 and 4, Tudor Street, E.C.4. The chair will be taken by Mr. W. Peter Rylands, of Messrs. Ryland Brothers, Ltd., Warrington, and the opening address will be given by Mr. F. W. Sander-son, M.A., headmaster of Oundle School. Questions and discussions will follow. No tickets are necessary.

An Old Boys' Association.

An Old Boys' Association, for members of the R.N.A.S. Armoured Car Section, has been formed, and any motor cyclist who joined this force, and who would care to become a member, is requested to communicate with the Secretary, Mr. J. A. Johnson, 74, Queen's Avenue, Finchley, N.3. It is hoped to hold social meetings in London and in any provincial town where it is justified by the membership, and it is further proposed that the association should have a benevolent function.

A Case of Overloading.

The following is an extract from a reader's letter, which is an excellent advertisement for the machine he favours, but which refers to a rather prevalent practice of overloading which we do not support:

"I have a 1914 $3\frac{1}{2}$ h.p. three-speed Rover, to which I have attached a single-seated sidecar. My usual load is my wife, myself, and two children age nine and six years. The machine has taken the four of us, with the addition of three gallon tins of petrol and 36 lb. of luggage, to North Wales several times on top gear with an occasional drop into second."

A Super Scooter.

We have information that an improved motor scooter is to be placed on the market. This will be built in England in large quantities, and sold at a moderate price. The producers hope to have 200 ready by the middle of May, and to turn out something like 5,000 during the present year. The scooter will have a $2\frac{1}{2}$ h.p. two-stroke engine, a two-speed gear, chain drive, and 20in. wheels. The frame will be of very novel construction, and a seat will be provided. Further information will be published in our pages when the various patents have been accepted.

A Motor Cycle Trial in Australia.

News is just to hand concerning the Sydney-Melbourne Inter-state Motor Cycle Trial. Only three machines went through the trial without loss of points, and one of these was a $3\frac{1}{2}$ h.p. standard Zenith, ridden by Mr. V. R. Blackett. This machine reached Sydney in the early part of 1914, and is a standard type without clutch or kick-starter. Blackett had to compete against the very latest and most powerful American productions. It was the first to enter all controls and first to arrive in Melbourne.

Blackett has already attained a great deal of fame in Australia as a long distance rider who is able to effect a low petrol consumption on his machine. The official record throughout the whole trial shows that the machine averaged 110 miles to the gallon.

Blackett was also successful in gaining the prize for the most meritorious per-

V. R. Blackett, who made a splendid performance in the Sydney-Melbourne trial, averaging 115 m.p.g. and losing no marks.



Special Features.

"REVS." AND THE SINGLE.
IMPROVING THE MOTOR CYCLE.
A SPRING FRAME ATTACHMENT.

formance and the prize for the machine arriving in the best condition.

At the conclusion of the trial Mr. Blackett returned home, reaching his destination without any hitch, which means that he travelled 1,600 miles with very little rest and under very trying conditions.

Henry Ford Again.

The New York correspondent for the *Express* says that Mr. Henry Ford intends to retire from his factories and to manufacture a new type of cheap motor car to sell for £50. Edsel Ford, who makes the announcement, says that two sites for the new plant are under consideration at Hamilton, Ont., Canada, and Troy, N.Y.

The £50 car, according to Edsel Ford, will appeal especially to people going to and from work, who are now able to take only infrequent leisure trips. He says it will embody lightness with increased strength, and the reduced cost will be due to several new inventions. This rumour, however, is not substantiated by the Ford Motor Co. in this country.

B.S.A.

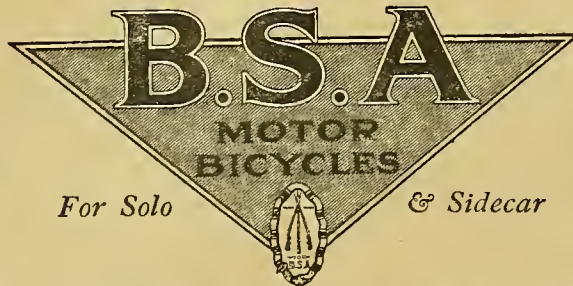
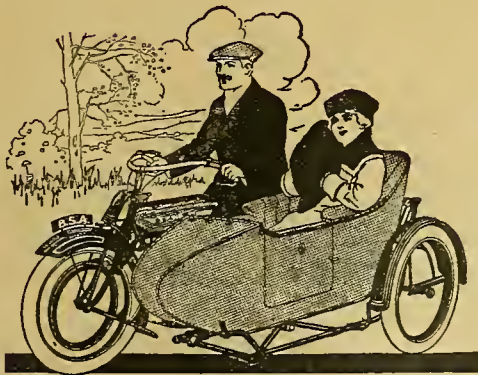
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and why—

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FREE ON REQUEST

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PLYMOUTH: Prudential Buildings.

SWANSEA: Chancery Chambers, Rutland St.

Sidecars "Outriders."

During his recent visit to Boston, Mass., President Wilson had an escort of police in sidecars.

Lady Tourist from Canada.

Miss Lillian Spencer, a Montreal motor cycle enthusiast, will come to England this summer to tour the "home" country.

Tom Silver Convalescent.

Mr. T. Silver is still at the Haddon Hall Hydro, Buxton, recuperating after a serious operation several months ago. He advises us that he will soon be back at the Quadrant factory.

1919 Enfields.

6 h.p. Enfield sidecar outfits are now 120 gns., the 8 h.p. model is 2 gns. extra. With dynamo lighting the prices are 140 gns. for the 6 h.p. and 142 gns. for the 8 h.p. model.

War Tax.

The extra war tax of 6d. per gallon on petrol appears likely to remain until the Budget requirements for the year are under consideration. In the meantime the R.A.C. and other motoring bodies are making every endeavour to have the burden removed.

Why Stand Up?

Are we to arrive at the genuine lightweight motor cycle *via* the scooter? We feel convinced that those who now show enthusiasm for the motor scooter will sooner or later—most probably sooner (!)—demand a seat. It would be quite a sensible demand too! Having obtained a sitting position, we have the lightweight motor bicycle.

A.C.U. General Meeting.

A large attendance is expected at the Digbeth Institute on Saturday next, for the A.C.U. meetings. At 2.30 the Annual General Meeting will elect a president and vice-presidents, and receive the annual report of the union and balance sheet for the past year. At 3.30 there will be the annual meeting of individual members, to elect twelve individual members to serve on the committee for the ensuing year, and at 4.30 there will be a meeting, open to all interested in motor cycling, when Mr. E. S. Shrapnell-Smith, C.B.E., Major Axford, O.B.E., and others will speak.

The Channel Tunnel.

Nearly a hundred years ago the making of a Channel tunnel was discussed, and now once more an intense interest has been focussed on the project. All the plans are ready for the work to commence immediately, and only the Government's consent is needed. France has always supported the idea; and, had it not been for the military opposition in this country, the tunnel would by now have been an accomplished fact. It is highly improbable that a roadway for motor vehicles will be constructed at the same time; but even so the advantages to be gained, from the motorist's point of view, are too manifest for discussion on the subject. That a vast and new touring ground will be available without an irksome sea passage is one advantage—though probably a minor one—that will appeal to motor cyclists.

N.M.C.F.U. (Coventry).

A meet and run has been arranged for March 22nd, with a view to attending the A.C.U. General Meeting at Birmingham. There are now 1,400 members of this branch.

Public Schools M.C.C.

A meeting will be held at the R.A.C. on Wednesday evening, the 26th inst., to revive the Public Schools M.C.C., and all motor cyclists interested are cordially invited to attend.

A.C.U. TO EXCLUDE FOUR-WHEELERS.

DECISION OF THE GOVERNING BODIES.

At a meeting of the R.A.C. and A.C.U. Joint Committee, held on Monday of this week, it was decided that in future "MOTOR VEHICLES WITH THREE WHEELS OR LESS SHALL BE DEEMED TO BE MOTOR CYCLES ALL OTHER MOTOR VEHICLES SHALL BE DEEMED TO BE 'MOTOR CARS'."

Representatives of the A.C.U. Competitions Committee, who have special interest in four-wheel cycle cars and light cars, are to be invited to attend the R.A.C. Competitions Committee meetings with a view to assisting in the organisation of light car trials

Drivers' Precautions on Westerham Road.

We are told that drivers of the motor 'buses on the Westerham Road are strapped to their seats because of the vibration set up by the large holes in the road. Two of the largest holes are known to the passengers as the Salt Box and Biggin Hill bumps. Both bumps indicate stopping points.

L.M.C. Prices.

The prices of the 1919 L.M.C. motor cycles are £85 for the 4½ h.p. and £95 for the 6-7 h.p. twin.

One-strokes?

We frequently receive "designs" for double-acting two-stroke engines which are described as "one-strokes."

"Bush" Newsome back again.

Capt. C. T. Newsome, the ex-Rover exponent, is demobilised and has deserted the motor cycle industry. He has now an appointment with the Rover Car Co.

'The Engine of the Sidecar Machine.'

To-night (Thursday, March 20th), Mr. Eric Caudwell will read a paper on "The Engine of the Sidecar Machine" before the Institution of Automobile Engineers, at the Chamber of Commerce, New Street, Birmingham.

A Sale of Army Motor Cycles

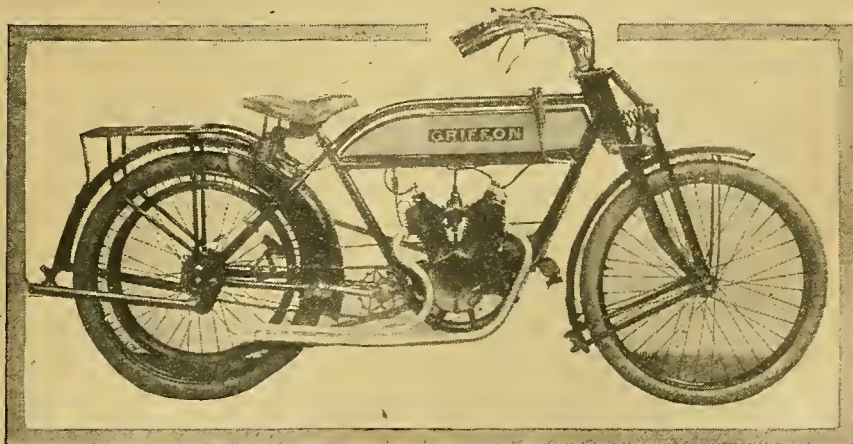
There will be a further sale of Army motor cycles held by Aldridges (Messrs. W. and S. Freeman), St. Martin's Lane, London, W.C.1, at the Gilbey Hall, adjoining the Royal Agricultural Hall, Islington, entrance in Barford Street, beginning at 10.30 a.m. on Friday next.

The Slough Motor Depot

There is a possibility of the great Slough Army Motor Depot scheme being modified. It will be remembered that £1,700,000 was to be spent in the project. A great deal of this has already been spent, to say nothing of the waste that has taken place.

The New Transport Bill.

The opposition that the dock and harbour officials are making against the Government's proposal to place the Minister of Ways and Communications in authority over their administration is having more effect than the agitation by the motoring interests against the inclusion of road control under the new Ministry. So says *The Daily Mail*. How such a conclusion was formed, however, is difficult to understand, for the agitation of the motor world could not possibly have been more whole-hearted than it has been.



The peace model Grifon, exhibited at the Lyons Show. It is a lightweight twin, which does not appear to compare favourably with the latest British machines, and has all-belt drive and pedalling gear. It will be noted that no silencers are fitted.

A SPRING FRAME ATTACHMENT.

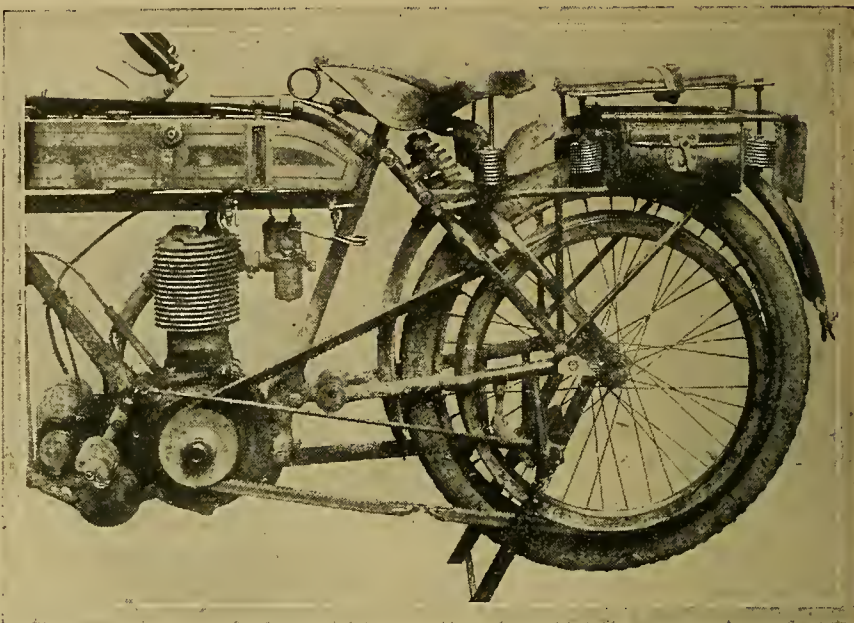
A Device to Convert Existing Rigid Frame Machines.

AT the moment, we can recall no firm specialising in converting conventional machines into spring frame mounts, and in view of the insistent demand for spring frames, owing to the condition of the roads at the present time, there appears no doubt that such a concern would receive support, provided the device they offered were efficient and the price moderate.

Over twelve months ago we illustrated a design for a rear springing attachment which was the invention of Mr. J. Warner, a Coventry engineer, but, owing to the war, nothing has been done in the way of marketing the device until recently. The arrangement, however, is not new. It has, in fact, been in regular use during the past three years on a Triumph machine, used both solo and with sidecar, and the fact that the invention has undergone very little alteration since we last saw it goes to show that its sponsors are satisfied with its performance.

Rigidity of Frame Retained.

As will be seen from the illustrations, the most outstanding features of the device are the double back stay and the single coil spring underneath the saddle. The rigidity of the frame itself is in no way lessened by the alterations which are necessary to fit the attachment. Probably a "spring wheel" is a more apt term to describe it than "spring frame," as the pivoting point is at the outer ends of the stays. The usual stay ends are replaced by two special members, in which swivel a pair of links that are continued normally in a straight line, and carry the wheel spindle at their middle,



The attachment fitted to a Triumph solo machine.

while an extra pair of stays are pivoted at their extreme ends. These stays normally are parallel with the rigid stays, and at the top, bridging the wheel, is a yoke, which is connected to a second link system placed immediately beneath the saddle and controlled by an adjustable spring. This upper link system consists of two plates or bars, which are attached to the yoke through a sleeve by means of a shaft which works on phosphor bronze

loads, such as when a sidecar is fitted or a pillion passenger carried, or both.

A company has been formed, to be known as Vowels, Ltd., with works at Mount Street, Coventry. This firm will undertake to make conversions. Where a machine is fitted with detachable "chain" stays it is only necessary to detach these and the rear stays for the necessary alterations to be made, otherwise the complete frame would have to be sent to have new stays fitted.

We understand that the price for the conversion is quite moderate, and that the workmanship will be guaranteed.

AMERICAN T.T.

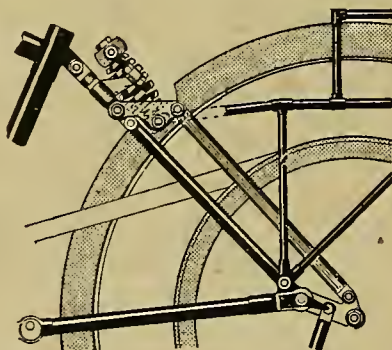
AN American T.T. race is on the boards, and several interesting suggestions are put forward by readers of the U.S. papers. One idea appears to be to hold a race in each State on a course of six to twelve miles, including a "long" hill. It is proposed to have no fewer than five classes (sidecars, heavy solos, mediumweights, lightweights, and "specials"). Presumably, the winners of the State races would meet to find the winner of the trophy.

Events of this character no doubt would stimulate interest during the whole of the summer season, and would give a greater number a chance to participate than in a single event.

An alternative suggestion is to hold a single race more on the lines of the International T.T., and a part of the Lincoln Highway is mentioned as a suitable course. Standard machines are favoured by the majority of the T.T. enthusiasts, who would bar eight-valve motors and other special racing machines.



The guard, saddle, and carrier removed to reveal the details of the Warner device.



The Warner spring frame attachment.

bushes, and are similarly attached to the rigid stays. Besides their two main connections, the two links are also connected by a bolt which forms a bridge, placed midway between the yoke and the rigid stays. On this bridge is fixed a spring, the top of which is adjustably fixed to the frame members. This is adjustable, and by means of a finger on the lower rigid stay it is possible to ascertain whether the tension is correct for various

THE BRITISH GOVERNMENT

during the war claimed the whole output of our works and enforced on us the renunciation of our extensive relations with the French and Italian Governments. The performance of

THE TRUSTY

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under strenuous active service conditions proved to our authorities that the TRIUMPH could be relied on to get there despite the wrecked roads, bad weather, and many handicaps of war-worn country.

Its easy start and quick get-away made it pre-eminently a machine for despatch running, while its bursts of speed and reserve power were certainly instrumental in saving the lives of our D.R.'s.

Our new models will retain all the merits of the war model, and be built to stand the same strenuous tests.

Nearly 2,000 Triumph agents in the British Isles are at your service. Why not have a chat with your nearest? He can give you all particulars and prices.

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COVENTRY.**



HERMES (Mercury)

HERMES, the god of merchandise and the messenger of the gods, according to Greek mythology, would also be the guardian deity of Motor Transport had such existed in those distant ages. He was the personification of rapidity of movement, and that is what the motor stands for to-day. The modern association with

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will appeal to all motorists. On the Allied fronts these tyres have established a unique record and played a big part in the rapidity of movement, so essential to our victory. And in the Peace activities on which we are entering, car owners desirous of efficient service will find them the ideal tyre equipment.

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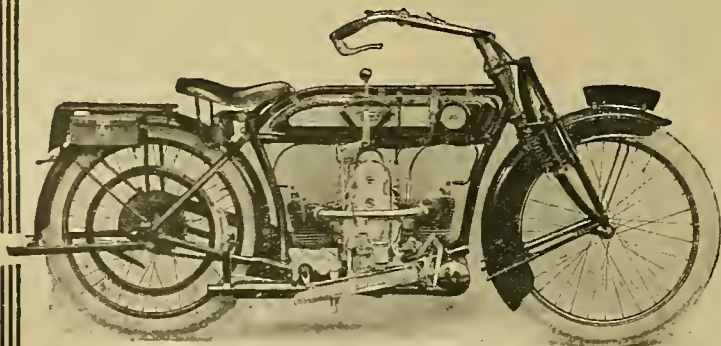
"I purchased it in 1911, and have ridden it continually in all weathers (hail, rain, blow, or snow) for over 40,000 miles. My repair bill has been exceptionally light. The machine is looked upon as a wonder in this district." Sept. 11, 1918.

Thus Mr. D. Ward, East Brent, Highbridge, in the best type of reminder that your new mount should be a HUMBER.

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3 1/2 H.P. TWIN HUMBER.



"REVS." AND THE SINGLE.

The Engine Speeds of Record Breakers on the Track.

THAT mystic symbol "r.p.m." does not always mean power. Because an engine is capable of high speeds, it is not necessarily a powerful one. The small internal combustion engine such as is used on a motor cycle depends upon its speed, it is true, but the limit of maximum power is reached before the maximum speed is attained. Hence "revs." do not always mean power, because most engines capable of, say, 5,000 r.p.m. reach their maximum power at a little over 3,000 r.p.m., after which the power falls off rapidly; in fact, the power at 3,000 r.p.m. may be 100% higher than at 5,000 r.p.m.

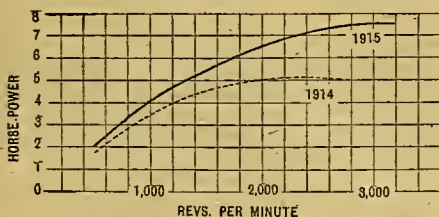
Should an engine on the track attain a higher revolution speed than that at which it gives its maximum power, this is proof that it is under-geared, the ideal ratio being that which will allow the engine to reach the speed which has been proved to be the top of the power curve, but not to exceed it.

One Advantage of the Flat Twin.

The ability to "rev." is cited as one of the greatest advantages of the flat twin. It is clear that the better mechanical balance of this engine allows of a higher rate of revolution, but, unless this high speed can be used to advantage, the rider gains nothing so far as power is concerned.

Certain it is, there is a limit beyond which poppet valves will not function properly. According to some authorities this limit is reached between 3,800 and 4,000 r.p.m.; hence one of the main reasons why the power curve falls off long before the maximum "revs." are obtained.

It is well known that a single-cylinder will develop more power than a number of smaller cylinders totalling the same capacity, because of the losses in friction and thermal efficiency, and it would appear that, until the higher revving ability of the flat twin can be used to full advantage, the single is bound to hold its present position both as the power unit of a general utility machine and as the propellant for the speed machine.

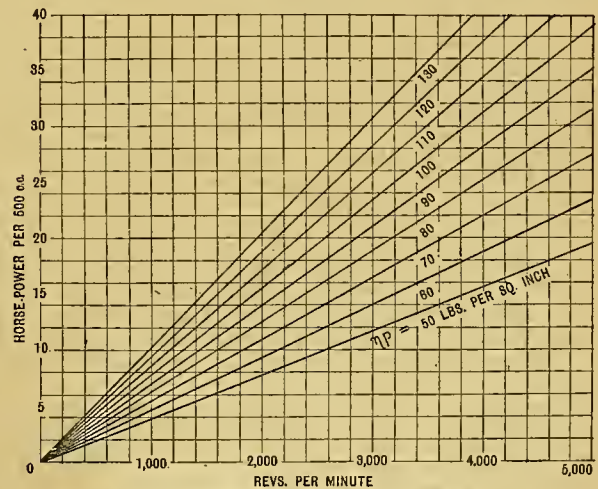


The power curves of 1914 and 1915 single-cylinder Harley-Davidson 4 h.p. models with 84.1 x 101.6 mm. cylinder, 564.9 c.c. capacity.

Although the flat twin is a higher revving engine than the single, the latter is capable of very high speeds, as has been frequently proved "on the bench," in which connection it may surprise the average reader to know that our greatest racing exponents

and tuners do not attach such great importance to bench tests as is generally supposed. I am told that many engines which beat all records "on the bench" prove inferior on the track to engines which have not given such good results on the dynamometer.

After all, it is in actual performance on the road or track where the real merit of an engine is demonstrated; therefore, the number of revolutions attained



A "graph" prepared by Mr. G. Funck, A.M.I.A.E., to show h.p. at various mean effective pressures.

on the track by engines of record-breaking machines is of far greater importance than the maximum revs. obtained on the bench, but, undoubtedly, both are interesting.

The gear ratio used on the Norton by O'Donovan during his last record, when he covered a kilo. at a speed of nearly 83 m.p.h., was $3\frac{1}{16}$ to 1. This gives an engine of 4,000 r.p.m. It may be assumed that, running under the more ideal conditions of a bench test, the revs. would jump up considerably, and that over 5,000 r.p.m. would be obtained.

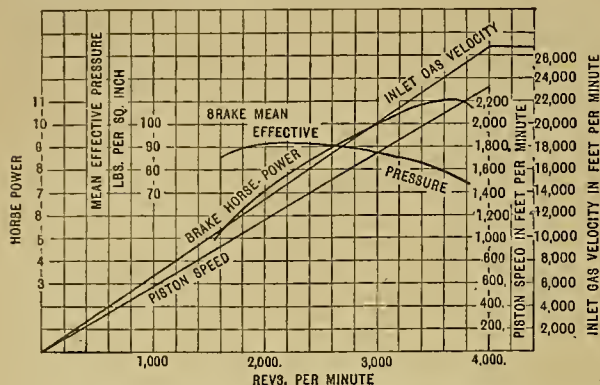
Particulars regarding the highest revs. attained by the $3\frac{1}{2}$ h.p. Norton engine running free are not obtainable, but, under load on the track, Mr. Norton tells me that 4,200 has been attained very frequently, without allowing for belt slip or wheel spinning. The power developed at this speed, at which the peak of the curve is reached, is approximately 16 h.p.

High "Revs." with Sidecar.

The larger Norton engine will reach a similar number of revs. under load, but the power curve begins to fall just a little earlier. 3,880 r.p.m., without allowing for belt and wheel slip, has been obtained with a sidecar, over an officially timed distance at a flexibility hill-climb, which called for a fast run with a 6 to 1 gear. The speed was 49.8 m.p.h. I

"Revs." and the Single.—

recall that a $3\frac{1}{2}$ h.p. Triumph with sidecar, tuned for a "speed burst," actually maintained a speed of 70 m.p.h. for a quarter of a mile, with and against the wind. The gear ratio was $5\frac{1}{2}$ to 1. Therefore,



The power curve of the 500 c.c. Rudge single.

the engine speed was 4,980 r.p.m. This particular machine was a Stanley-tuned Triumph, used by J. Cocker. These speeds were obtained during comparatively short periods, but the hour records obtained by Stanley in 1913 show that singles are capable of high revs. for longer runs.

For example, the hour record for engines not exceeding 350 c.c. is still held by a Singer single, having a bore and stroke of 75×79 mm. respectively. This little machine covered 62 miles 1,199 yards in the hour (62.68 m.p.h.), which represented an average engine speed of 3,950 r.p.m., as the gear ratio was $4\frac{7}{8}$ to 1.

It is interesting to compare some of the speeds of the various types of engines which hold or have held records in this class, and for this purpose the following schedule is appended:

DOUGLAS (flat twin)	Flying km.	30.8 secs.	72.63 m.p.h.
SINGER (single)	1 hour	62 mls. 1,199 yds.	62.68 m.p.h.
NUT-J.A.P. (V twin)	100 miles	1h. 36m. 7s.	62.42 m.p.h.
MARTIN-J.A.P. (single)	Flying km.	32.76 secs.	68.28 m.p.h.

True, the flat twin scores with a half-minute run at 72.63 m.p.h., but one can better compare the respective performances of the V twin and the single in the longer runs. The flat twin does not hold any long duration records, whereas the single and the V twin, both artificially balanced as compared with the flat twin, kept up their revs. for an hour and an hour and a half respectively.

350 c.c.—5,000 r.p.m.—13 h.p.

The gear ratio used by Bailey on the Douglas when he broke the flying km. record is not available, but on test the engine proved to be capable of 6,500 r.p.m., the peak of the curve being in the neighbourhood of 5,000 when the power developed was said to be about 13 h.p. This particular engine was a special racing Douglas fitted with steel cylinders made by the A.B.C. company.

In the 500 c.c. class no V twins have held important records, and at the present time the single-cylinder holds all of them. For a short time the A.B.C. held the flying kilo. and the flying mile, but these were quickly recaptured by a Norton single. In this class we have more particulars concerning gear ratios, and,

consequently, engine speeds also. Below are given some of the record speeds, together with the gear ratios:

NORTON (single)	Flying km.	82.85 m.p.h.	$3\frac{1}{4}$ to 1	4,000 r.p.m.
A.B.C. (flat twin)	Flying km.	80.47 m.p.h.	$3\frac{3}{4}$ to 1	3,770 r.p.m.
SINGER (single)	1 hour	67.44 m.p.h.	$3\frac{1}{2}$ to 1	3,120 r.p.m.

From the above it will be seen that in the 500 c.c. class, under record-breaking loads, the single's revs. were higher than those of the flat twin.

What are the highest speeds attained by a reciprocating engine of the motor cycle type is not on record, but it is stated that the 250 c.c. A.B.C. running light attained a speed of 8,000 r.p.m., and this it seems would probably be the world's record. On test this little engine, which weighed 14 lb. without magneto and carburetter, developed 2 h.p. at 2,000 r.p.m., 3 h.p. at 3,000 r.p.m., and 4 h.p. at 4,000 r.p.m. That 5 h.p. was not obtained at 5,000 revs. goes to show that the peak of the power curve was somewhere in the neighbourhood of 4,000 r.p.m., hence the revs. above this speed only served to demonstrate the perfect balance of the small flat twin.

500 c.c.—3,700 r.p.m.—10 h.p.

Perhaps the nearest approach to the revs. obtained by the little A.B.C. of which definite information is available was that obtained by Messrs. F. E. Baker, Ltd., with a certain Precision single, which attained 6,000 r.p.m. on the test bench, but the top of the power curve was 3,700, while a Green-Precision single developed slightly more power, *i.e.*, 10 h.p., at much lower speeds.

The highest recorded revs. of a Rudge 500 c.c. single were 5,000 r.p.m., when the power at the peak of the curve (3,600 r.p.m.) was 10.9 h.p. According to a Rudge publication, the 750 c.c. single has attained a speed of 4,000 r.p.m.

To summarise, it is permissible to conjecture that the maximum speed at which any internal combustion engine will give power proportionate to the revs. is in the neighbourhood of 5,000 r.p.m., and that only the flat twin has been able to do this owing to its superior balance. It has yet to be proved, however, which type of engine is best able to maintain its speed and power for long periods. At the present time the single leads on the point of records, and no doubt there will be keen contest between these two types in the future.

VEDETTE.



UNSIGHTLY ADVERTISEMENT HOARDINGS.

The Derry House, Wolston, Warwickshire, a landmark known to thousands of motor cyclists. Several manufacturers advise us with regret that this quaint little cottage may shortly be disfigured with hoardings—a regrettable act in view of the constant appeals to improve our villages and preserve the beauty of the landscape.

VALUE FOR MONEY

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brings you the following **FREE** Benefits:

FREE "GET-YOU-HOME" SCHEME, whereby in case of accident or breakdown on the road your machine is taken to the nearest garage and a car is placed at your disposal to drive you and your passenger home or to the nearest Railway Station, FREE Legal Advice and Defence on all matters motorcycling, FREE Assistance of the R.A.C. Road Guides, FREE Use of a Reading Room at the R.A.C., FREE Assistance in Touring and Foreign Travel, SPECIAL INSURANCE FACILITIES, etc., etc.

The Auto-Cycle Union is recognised as the champion of every cause which has the welfare of motorcycling interests at heart, and the annual membership subscription of 10/- is in no sense proportionate to the numerous practical advantages the member derives. A.C.U. members are entitled to Special Benefits which cannot be obtained from any other motorcycling association, and it is in the direct interest of every motorcyclist to join the A.C.U. without delay.

*Fill in and Post the Information
Coupon below for full details NOW!*



Information Coupon

The Secretary, AUTO-CYCLE UNION,
PALL MALL, LONDON, S.W.1.

Please send me further particulars regarding
the advantages of becoming a member of the A.C.U.,
together with Application Form for membership.

Name.....

Address.....

"The Motor Cycle," 20/3/19.

SPECIAL NOTICE.—ANNUAL GENERAL MEETING of the A.C.U. will be held at Digbeth Institute, BIRMINGHAM, on Saturday, March 22, at 2.30 p.m. All Members of the A.C.U. and Affiliated Clubmen should endeavor to attend. 3.30 p.m., Meeting of Individual Members. 4.30 p.m., MONSTER PUBLIC MEETING of all Motorcyclists.

In answering this advertisement it is desirable to mention "The Motor Cycle."



This announcement is issued by the following British firms who invite enquiries for particulars of their various models :

**British L.M. Ericsson Mfg.
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**British Thomson-Houston
Co., Ltd., Coventry.**

British made means well made



British magnetos

are examples of British scientific engineering at its best. In the past four years they have proved that "British made is well made." They are more efficient and reliable than any Magnetos which have been produced at any time or anywhere.

They are made to standard dimensions and interchangeable and in sufficient quantities to meet every demand.

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SUNBEAM MOTOR CYCLES

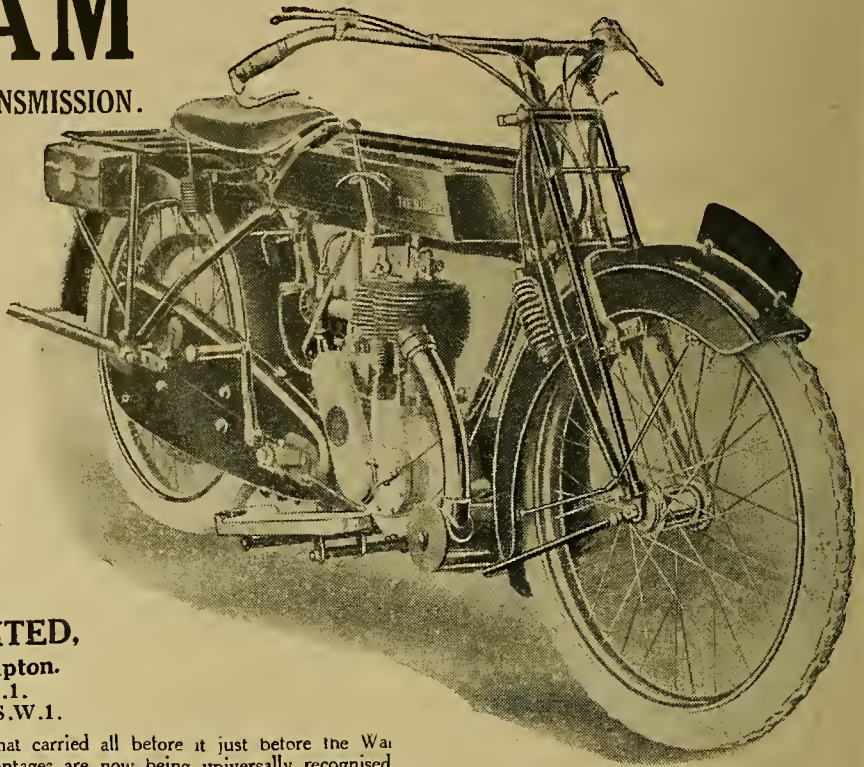
WITH PERFECT POWER TRANSMISSION.

*The Best Motor Cycle before
the War—during the War—
AND AFTER THE WAR.*

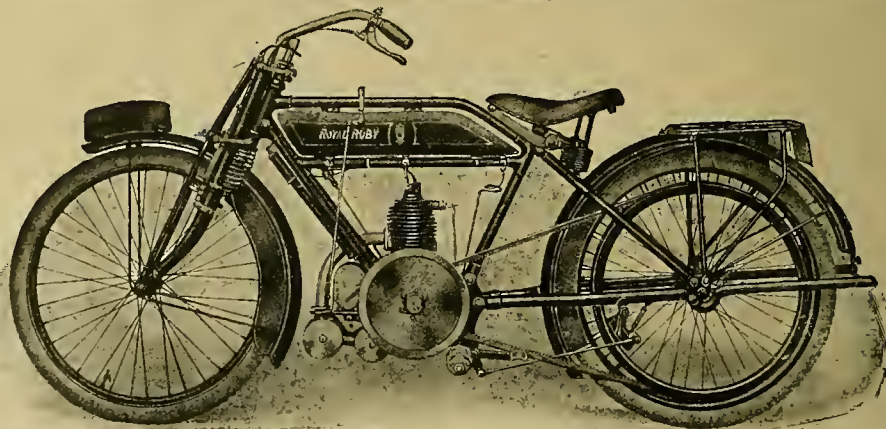
AS the time is coming near when Sunbeam Motor Cycles can again be supplied to the general public, it will be a *Source of Satisfaction for You* to remember that your name is on their Waiting List. Application should be made at once to

JOHN MARSTON, LIMITED,
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London: 57, Holborn Viaduct, E.C.1.
157 & 158, Sloane Street, S.W.1.

N.B.—The Sunbeam is the Motor Bicycle that carried all before it just before the War began. Its extraordinary reliability and advantages are now being universally recognised.



ROYAL RUBY



2½ H.P. 2-STROKE LIGHTWEIGHT
AN OPPORTUNITY FOR EASTER.

Those looking forward to the Easter holiday will find the Royal Ruby 2-stroke single-speed Lightweight just what they are wanting. With the Royal Ruby special frame with Patent Safety Stays, Villiers 2½ h.p. 2-stroke engine, Dunlop motorcyclette 26in. x 2in. B.E. tyres, Dunlop belt, and Brooks saddle, it is, without question, at £40 nett cash, the best value on the market.

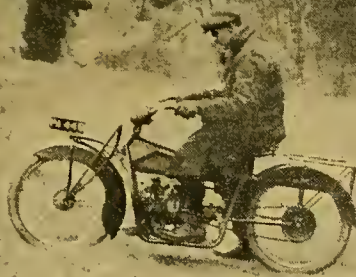
THE ROYAL RUBY CYCLE CO.,
CANNEL STREET, ANCOATS, MANCHESTER.

Telephones—City 3818—Central 1570.

Telegram—“Machines Manchester.”

ROAD IMPRESSIONS of the NEW A.B.C.

By B.H. DAVIES



J. L. Emerson—who broke records on A.B.C. machines before the war—riding the new model up Box Hill.

A Lightweight which in its Performance will Rival a Heavy High-powered Machine.

VERY seldom does the jaded journalist, who is perpetually sampling new machines on the road, encounter a mount which impresses him as fundamentally "different" from the ordinary run of motor cycles. I have had several such experiences—the first $2\frac{3}{4}$ h.p. Triumph, with its engine built into the frame instead of gummed on: the original Douglas, the pioneer of flat twins: the Scott: the 1914 A.B.C. with its perfect springing. Last Thursday I marked down a fresh milestone on the road of progress after I had sampled the paces of the 1919 3 h.p. A.B.C. As it is fundamentally "different," I am going to analyse its gait in some detail, but, by way of summary, I shall say that it is not a motor cycle at all: it is a two-wheeled car. Let me make this plain. When you drive a car, you forget all about your engine—if it is a good one—until you need full power on a speed burst or a freak hill. On the average pre-war motor cycle you *could not* forget the engine. But the new A.B.C. has no "period," and is silenced right down to a low hum. Unless you are an engineer, you forget it is there: and you float along the road, conscious rather of motion than of the mechanism which is responsible for the motion. These psychological effects are due to several detail excellences, which are emphasised later in these notes—the absence of any effort to balance or steer, the car-like insulation, as well as the smooth quietness of the engine.

The second dent which the machine made in my brain was due to its lightness. When I read the specification in last week's *Motor Cycle*, and saw the weight given as 175 lb., I grinned an unbelieving grin. But I was wrong. The machine is far and away the lightest complete specification I have ever handled. It is a cross-breed between the Morris-Oxford light car and J. S. Holroyd's famous $1\frac{1}{4}$ h.p. Motosacoche. I do not know how to put its *nuances* better than that. I have previously bestridden a few (a very few) machines which felt more like cars than motor bicycles:

but I can say without hesitation that I never tackled one which was not a welter-weight: and this is a high-bred bantam.

Powers of Acceleration.

A *game* bantam, I ought to have said. A fear-nothing last ditcher. Let me particularise. Between ourselves I have known the engine—or its first cousin—for years, seen the tiny fellows revving incredibly as they operated blowers or dynamos for the W.O. So I knew it could rev, and I knew it could *keep* cool. But my colleague "Ixion" is always wringing his grimy hands over flat twins, because he says that they either rev or tug a high gear: but that one and the same sample never does both. Well, he is wrong. The gear ratios of this fellow are 5.2, 7, 10.25, and 13.5.

First I tested the acceleration on the $10\frac{1}{2}$ gear, and nearly did a back loop over the carrier. Nothing to be amazed at in this—most flat twins can "jump" if you slam the throttle open on a 10 to 1 gear, though this engine does it on the gilt-edged scale—*à la* four-cylinder Henderson: you must not be rash in giving it gas with one hand on the bar. Next, at about 20 m.p.h., I changed up rather suddenly on to the 7 gear. "Now she's going to be sticky!" I prophesied. Not a bit of it. I got another terrific "jump," and the Brooklands D.F.P. just astern had to hustle itself to keep in touch with my dust. This shook my cynicism. I slowed back to 20 m.p.h., put in the 5.2 gear, and slammed everything on again. Ye gods! I had no speedometer, so I cannot be precise. I should estimate the machine was up to 55 m.p.h. in a very brief patch, and the helmsman of an Alpine Rolls ahead confirmed the guess. Well, I knew what "Ixion's" next croak would be, and the hilly, twisty streets of Leatherhead were not far off. I got the engine as hot as I could by some crazy sprints on bottom and second: then I put on top gear, and

Road Impressions of the New A.B.C.—

tackled the winding slopes at a positive creep with the throttle shut right down. The game little bantam burbled manfully up. So here we have a tiny flat twin which can be driven on the throttle instead of on the gear lever, which can rev, accelerate, and slow climb on all its gears, and has a range of approximately 10-60 m.p.h. on top. Good enough, eh?

An Unrehearsed Test.

It is an insult to ask whether the machine can climb. I estimate it can haul a sidecar up any main road hill. I saw Jack Emerson drive it on third gear up the steep grass slope of Box Hill behind the Burford Bridge Hotel. He tried and tried to get the back tyre to bite on another grass slope and on a wet chalk path, both graded at quite 1 in 3: but the moisture was against him. Incidentally, he made a comically unpremeditated test of what the man in the street considers (quite falsely) to be a snag in this machine. Emerson was trying to climb a greasy chalk path with a grade of 1 in 3 or worse. The path resembled a trench after a bombardment, and the tyre would not bite on the wet chalk. So we lifted the machine out of the trench and Emerson made a clutch start in the grass of the parapet. Suddenly his tyre bit and chucked Emerson and the jigger down into the trench. Machine and rider rolled over and over, and the wet chalk faithfully marked every point of contact for identification purposes. Nothing was bent or dented, and not one solitary portion of the power unit was even touched.

The machine I rode is one of the hand-made experimental batch—not a Sopwith production mount: and a number of oddments are still under attention. The slow running is to be perfected. A stop is to be added to the clutch. Experiments are to be made with stiffer springs for heavy riders. But I have no hesitation in saying that if the production machines are no better than the sample I tested, they will nevertheless create a *furor*. A genuinely powerful, genuinely comfortable, high-speed touring mount at 175 lb. is a welcome novelty.

The Latest in Lubrication.

Turning to features of less novelty, I think the lubrication and the springing represent the chief interests. We have had plenty of motor cycle engines with automatic lubrication, though we have not before had one which can do 1,500 miles on one filling: and, generally speaking, the more automatic a lubrication system has been the shorter the life of the bearings,

because small, overloaded, phosphor-bronze bushes demand more than lubrication—they insist on oil-cooling. But here we have a hot-stuff engine which receives no fresh oil for a month of hard riding in summer (the pump circulates the whole supply once every three minutes). How will it stand up? Only time can show, but I have no doubts. I maltreated the little engine shamelessly, but I could not wring a conk or even a warm smell from it. The secret is obvious. The vital bearings are all either rollers or ball. Both types actually run best in a *dry* state theoretically. They are lubricated in practice as a preventive against rust, which is their deadliest enemy; in no other way can you keep moisture away from them.

Springing and its Limitations.

As regards the springing, I must differentiate between ordinary roads and very bad roads. On normal surfaces, good, bad, or indifferent, the idea of springs simply does not occur to you. With a spring fork and a rigid main frame, one is perpetually thinking, "Quite a good fork, this!" or "Ugh! that was some pot-hole," or "They have remade this road." On the little A.B.C. the normal motion is so smooth that the speed or the scenery absorbs attention, and such things as road and springs pass into oblivion. But on a really bad road the spell is undoubtedly broken. For example, there are 6in. pot-holes on the road from Hersham to Esher, which the River Mole floods at intervals; and the springing cannot damp out such holes as these. I doubt whether any springing could, for even the back axle of a Rolls thumps horribly over them. I am loth to quote this as a criticism on the machine, for I do not dream that any vehicles can float over such atrocious going.

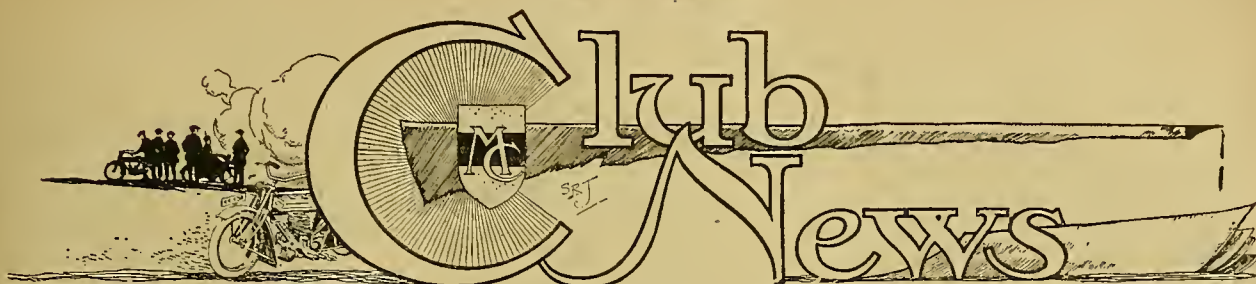
Control is extremely simple. The gear box works as silently as on any £1,000 car. The two hub brakes are smooth and powerful. The clutch (under left grip) has ample leverage. The ignition may be left fully advanced all day. The throttle lever has rather too big an arc to be convenient for finger range, but is, of course, preferable to two levers. The steering is quite admirably planned: I did my best to provoke a "speedman's wobble," but could not get it.

Altogether, the firm is to be congratulated at having stepped right into the front rank at the first attempt, and that, with a machine of comprehensive originality, with no plagiarism from the successes of the older competitors. If the new A.B.C. proves as durable as it is unquestionably superfine, a magnificent future awaits it.

[A detailed and fully illustrated description of the A.B.C. appeared in last week's issue. —Ed.]



The writer astride the new 3 h.p. A.B.C.



North Middlesex Wireless Club.

As most members of the above club are motor cyclists, Mr. E. M. Savage, the hon. secretary, asks us to invite old members to communicate with him at Nithsdale, Eversley Park Road, Winchmore Hill, N.21.

Essex M.C.

At the annual general meeting, recently held, it was decided that a dinner should be arranged as soon as possible, and this will be held either the last Saturday in March or the first Saturday in April. The time and place will be announced later. All members on the books at August, 1914, who have served in His Majesty's Forces will receive a free invitation. The opening run will take place on April 13th; the venue will be announced in due course. It has been decided that advantage shall be taken of affiliating members to the A.C.U. The hon. secretary, Mr. D. S. Kapadia, Algers Road, Loughton, Essex, will be pleased to hear from intending members.

York and District M.C.C.

At the first committee meeting held recently the following events were fixed: April 9th, opening run to Farndale, tea at Kirby Moorside; April 21st, run to Fountains Abbey; May 7th, slow hill-climb at Garroby; May 17th, paper-chase; May 21st, reliability trial, Greenhow climb, etc.; June 7th, help London-Edinburgh Trial at York; Whit-Monday, June 9th, run to Scarborough; Wednesday, June 25th, Garroby hill-climb; Saturday, June 28th, run to Bridlington.

Coventry and Warwickshire M.C.

A special meeting of the committee was held at 19, Hertford Street, Coventry, on March 11th, when a preliminary list of fixtures for club members was drawn up for 1919. Mr. M. F. W. Sampson was elected honorary secretary. It is not proposed to hold any open events this year, but a strong social and sporting programme will be submitted for approval at the annual general meeting for the benefit of members only. The annual general meeting was fixed for March 28th at "The Towers," Warwick Road, Coventry, at 8 p.m., when it is hoped that a large attendance of members and prospective members will meet. The entrance fee is abolished for the first fifty new members, and the annual subscription has been fixed at 10s. for all members.

The opening run will take place on Saturday, April 5th, when a speed judging competition will be held on a circular course. Forms of membership may be obtained from the hon. secretary, 19, Hertford Street, Coventry.

Future Events.

- Mar. 22.—A.C.U. General Meeting, Digbeth Institute, Birmingham.
 Mar. 22.—N.M.C.F.U., Coventry. Run to Birmingham to attend A.C.U. Meeting.
 Mar. 23.—Woolwich, Plumstead, and District M.C. Run to Winchelsea Camp.
 Mar. 23.—N.M.C.F.U., Sheffield. Run to Castleton.
 Mar. 23.—N.M.C.F.U., Leeds. Run to York and Harrogate.
 Mar. 27.—N.M.C.F.U., Leeds. Whist Drive and Dance.
 Mar. 30.—N.M.C.F.U., Sheffield. Run to Matlock.
 Mar. 30.—Woolwich, Plumstead, and District M.C. Hill-climb.
 April 5.—Birmingham M.C.C. Opening Run to Stratford-on-Avon.
 April 6.—The M.C.C. Opening Run to Hatfield.
 April 6.—Woolwich, Plumstead, and District M.C. Non-stop Trial from Knockholt to Lamberhurst and Back.
 April 9.—York and District M.C. Opening Run to Farndale.
 April 13.—Liverpool M.C. Opening Run.
 April 13.—Essex M.C. Opening Run.
 April 18.—Darlington B. and M.C. Opening Run.
 April 21.—Birmingham M.C.C. Open Reliability Trial for Victory Cup.
 April 21.—Dublin M.C.C. Dunlop Cup Trial.
 April 21.—York and District M.C. Easter Run to Fountains Abbey.
 May 3.—Birmingham M.C.C. Social Tour.
 May 4.—N.M.C.F.U., Sheffield. Reliability Run to Knutsford.
 May 7.—York and District M.C. Slow Hill-climb at Garroby.
 May 17.—York and District M.C. Paper-chase.
 May 21.—York and District M.C. Reliability Trial.
 May 24.—Birmingham M.C.C. Social Touring Trial. Week-end to Llangollen.
 June 9.—Dublin M.C.C. Whit-Monday Trial.
 June (end of).—Dublin M.C.C. Twenty-four Hours' Reliability Trial.
 Aug. 2 and 4.—Dublin M.C.C. Trial.

The B.M.C.R.C.

At the recent meeting of the committee of the British Motor Cycle Racing Club it was decided to pursue a vigorous programme for 1919. It was determined not to wait until Brooklands track was repaired, but in the event of this not being done during the summer, efforts would be made to hold speed trials elsewhere, at such places as Rhyl, Bournemouth, Southend, and Doncaster.

Hull M.C.C.

Mr. Fred Hall, 1, Margaret Street, Hull, is working energetically to organise this club, and invites all motor cyclists in the Hull district who are interested to call upon him any day between 9 a.m. and 7.30 p.m. Mr. Hall hopes to call a meeting shortly.

Abersychan (Mon.) M.C.C.

At a meeting of motor cyclists held at Abersychan on March 8th it was decided to form a motor cycle club. Mr. W. H. Oliver, Crown House, Abersychan, who was appointed hon. secretary *pro tem.*, will be pleased to hear from any motor cyclists in the district who are interested in the movement.

Woolwich, Plumstead, and District M.C.

A preliminary fixture list has been arranged, which includes a hill-climb on the 30th of this month an Easter tour to N. Wales, fifty miles non-stop trial, also in April, open trial for Matchless cup in May, team trial in June, inter-team trial in August, etc. The secretary is Mr. F. J. Ellis, 3, Nightingale Place, Woolwich, S.E.18.

The Motor Cycling Club.

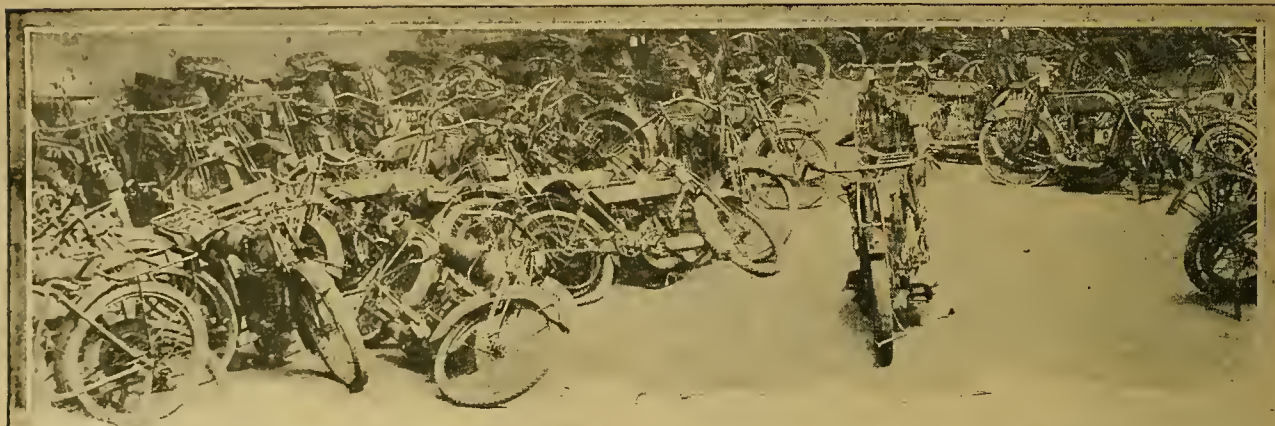
An excellent programme has been arranged for the M.C.C. concert, which is to take place at 7.30 to-morrow (Friday) evening, at the large Queen's Hall. Tickets are free, and may be obtained from the secretary, Mr. Southcomb May, 15, Endsleigh Gardens, London, N.W.1., or from the Editor, *The Motor Cycle*, 20, Tudor Street, London, E.C.4. Ladies are invited. The seating accommodation will be upstairs, and also in the central hall, at tables seating eight or twelve people. Visitors are requested to come early so as to find accommodation. It may also be mentioned that invitations are extended not only to members of the M.C.C., but to other clubs and all those interested in the pastime. A collection will be made during the evening for St. Dunstan's Hostel.

Birmingham M.C.C.

At the last committee meeting a provisional list of fixtures was arranged for 1919. The committee are anxious to make club life more attractive to the average motor cyclist, and with this object in view are arranging for more social tours than usual.

Competitions commence with the opening run, which is fixed for April 5th, to Stratford-on-Avon. All motor cyclists (members or otherwise) are invited to attend this event. A speed-judging test will be coupled with this run, for which medals will be awarded. Hon. sec., W. H. Egginton, 76, Earlsbury Gardens, Birchfields, Birmingham.

SALE OF 200 ARMY MOTOR CYCLES.



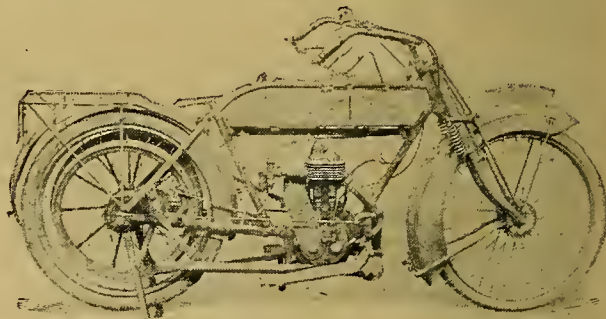
A RECORD sale of surplus Army motor cycles, over 200 in number, was held by Aldridges (Messrs. W. and S. Freeman), St. Martin's Lane, London, W.C.2, at the Gilbey Hall, Barford Street entrance, adjoining the Royal Agricultural Hall, Islington, beginning at 10.30 on Friday morning last. The sale continued right through the day without a break, and was not concluded until 6.30 in the evening. Two auctioneers conducted the proceedings in turn from a car in the centre of the hall.

All the motor cycles sold were of makes not standard with the Government, and consisted of Scott, Zenith, Humber, Lea-Francis, Indian, Matchless, Chater-Lea, Ariel, N.U.T., New Hudson, L.M.C., Griffon, Rex, Calthorpe, N.S.U., Motosacoche, Bat, James, Premier, Rover, Rudge, A.J.S., Campion, Regal, Excelsior, Royal Enfield, Singer, and Bradbury.

The first batch of machines consisted of twenty Scott motor cycles and sidecars, which ranged from 22 guineas to 41 guineas. The machine sold at the last named price had flat tyres, no filler cap to the petrol tank, the top of the radiator dented, and the front mudguard patched. Most of the machines were suffering badly from rust and neglect, and many had important parts missing. A Zenith which fetched 35 guineas had the back mudguard worn through, a badly worn gear lever, and was, generally speaking, in very far from first-class condition. The highest priced Zenith fetched 36 guineas. One, sold at 16½ guineas, was in a terrible state. The magneto chain case and magneto platform had been bent nearly at right angles, the front forks were twisted, and there was no front wheel. Its companion, which sold for 17½ guineas, had no back wheel, and was in a deplorable condition.

Of the Humbers sold, the highest price was 27 guineas, while the highest priced Lea-Francis went at 30 guineas. One of these popular machines, sold for 16½ guineas, had no carburetter, no saddle, and no gear box. An Indian motor cycle and sidecar was sold for 70 guineas—the highest price reached.

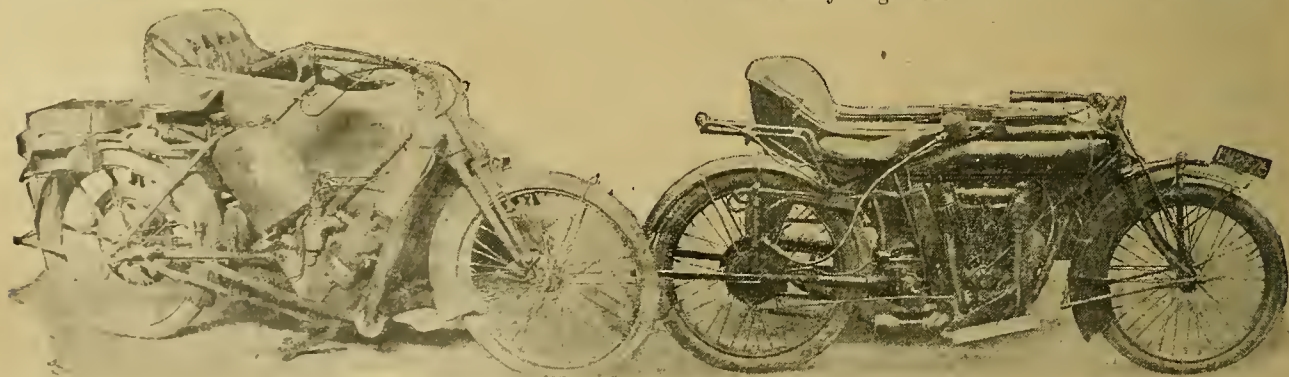
The final batch of motor cycles, 148 in number, all commanded good prices, and even discarded frames of such makes as Matchless, Ariel, etc., were sold at quite a respectable figure. The highest priced Ariel fetched 34 guineas, the best N.U.T. £28 8s. The New Hudsons ranged from £9 19s. 6d. to £36 15s. A Griffon motor cycle frame went for £5. Even the two German N.S.U.'s went by no



Lot 21. A 3½ h.p. New Hudson in very poor condition.

means at bargain prices, fetching 16 guineas and £8 18s. 6d. The single Motosacoche went for £22 7s., and the best Bat for £21. Next followed a large batch of Scotts, and for these the best price was £32 11s.

As regards high prices, two of the many Premiers went for 30 guineas and two for 32 guineas, while some of the Rovers fetched 21 guineas, 24 guineas, 28 guineas, and 30 guineas. One of the A.J.S.'s was sold for the exceptionally good figure of 47 guineas, and an Enfield made 32 guineas. A Singer motor cycle fetched 25 guineas, a Rudge 26 guineas, and a Bradbury 45 guineas.



A Scott and an Indian which sold for 22 and 70 guineas respectively.



“GOING LIKE A BIG 8”

“FRANK MELLOR, on his little $2\frac{3}{4}$ 'DOUGLAS,' did a fine ride. His average indeed was wonderful.” Such is the report of ‘Motor Cycling’ on the TEN mile INDIAN handicap, held at SYDNEY’S Big Carnival. For FOUR years the little “DOUGLAS” has been too busily engaged to worry about sport and competitions. Its first appearance under PEACE conditions in SYDNEY, proved beyond doubt that not only is it capable of retaining its position in its own class but of whacking the bigger machines in larger classes, for it obtained TWO—first, ONE—second, and a third at this meeting, even after the handicappers had penalised it to the extent of conceding start to much larger-powered machines.

Register your name and address with Department “B” for our “1919 PEACE Programme,” which will be issued in the course of a few weeks.

DOUGLAS MOTORS, LIMITED,
KINGSWOOD, BRISTOL.

Douglas

The TALBOT GARAGE, Ltd.

STOCKPORT,

Are the sole distributing Agents for Lancashire and Cheshire for the Famous



Greatest engine efficiency and power for all purposes by air-cooled, flat twin power unit. 15% reduction in fuel consumption. Luxurious riding comfort by scientific leaf springing. Greater resiliency by 30% lighter frame construction, with 100% greater strength. Four-speed gear box. Automatic lubrication. Send for particulars and early delivery dates, and secure your mount for this season's riding.

'Phone: 500, Stockport.

'Grams: "Talbot Garage, Stockport."

Sports Model.



The theoretical object of twin-cylinders—i.e., additional power with smooth running—is not always attained; but when such does transpire, it is at the expense of the simplicity and economy of the single. The problem of smooth power production, combined with low maintenance cost, petrol economy, wonderful speed, and hill-climbing capabilities, has been solved in the Norton simple single. Hence our post-war programme is 'SINGLES ONLY.'

Utility Model.



NORTON

THE UNAPPROACHABLE

NORTON MOTORS, LTD.,
ASTON, BIRMINGHAM.

"I, at least, have no use for a twin with such a single on the market."
—CAPT. J. MAITLAND DINWIDDIE, H.L.I., Oct. 14/18

London BARTLETT & CO.,
Agents: GT. PORTLAND ST.



THE VELOCETTE 2½ h.p. TWO-STROKE holds the record for lowest petrol consumption—229 miles per gallon. It is fitted with a highly-successful AUTOMATIC LUBRICATION SYSTEM.

Preliminary list now ready. Send your name and address.

VELOCE LTD., FLEET STREET, BIRMINGHAM.



LAST LONGER THAN ORDINARY PLUGS.
1, KING'S ROAD, ST. PANCRAS, LONDON, N.W.1. 'Phons: North 1927.

In answering these advertisements it is desirable to mention "The Motor Cycle."

ROAD REPORTS.

SCOTLAND.

THE ferry between Grantown and Burntisland will commence running on April 1st. This will save motor cyclists going round by Stirling to get to the North of Scotland. Another route, of course, is *via* Queensferry.

Edinburgh-Stirling.—Very good to Lauriston, thence to Stirling very bad, and in some cases positively dangerous for solo riding.

The road to Airth is excellent as regards surface to within five miles of Stirling, where the road has been badly cut up by Admiralty operations.

Edinburgh to Peebles.—Road excellent.

Peebles to Selkirk.—Excellent except for one or two short stretches.

Galashiels to Edinburgh.—Very good, but badly cut up in places.

SOUTH WALES.

Swansea-Cardiff road.—Generally good, parts very good. Tramlines in Neath and Briton Ferry require care when riding solo. Outskirts of Cardiff bumpy.

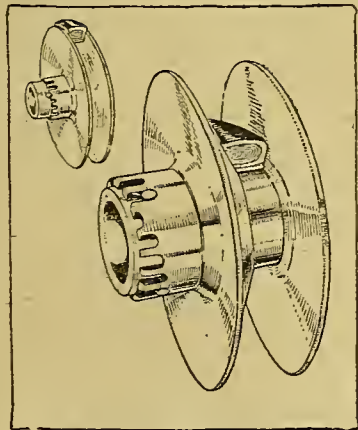
Swansea to Brecon and Hereford road.—Very bad as far as Ystalyfera, owing to 'bus and commercial traffic. Fairly good second-class road from Ystradgynlais to Sennybridge over Bwlch. Good condition from Sennybridge to Brecon and Hereford except some short patches where timber hauling has been in progress during the winter months.

THE MABON ADJUSTABLE PULLEY.

EVEN in these days of change speed gears the adjustable pulley is still a useful, if not an almost indispensable, adjunct to the belt-driven motor cycle, as it enables the whole range of gear ratios to be altered to suit the conditions under which the rider is travelling.

The particular pulley under consideration is the design of Mr. A. Mabon, who has been responsible for the introduction of many devices in connection with the pastime which have been of great utility. Mr. Mabon has built his own engine, was the inventor of an ingenious plate clutch fitted to the engine-shaft, and of the Mabon variable pulley gear, besides numerous other contrivances.

The illustration shows the pulley in the



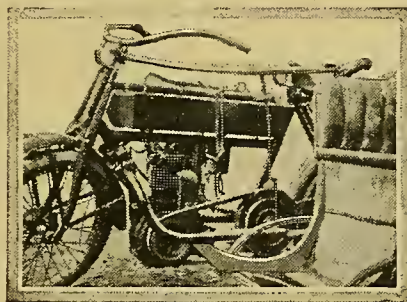
The Mabon adjustable pulley.

highest and lowest gear positions. The pulley works in the following manner: On the boss forming part of the inner flange are three studs placed at equal intervals, which engage in any one of the five recesses, of which there are three sets. To alter the gear, it is only necessary to remove the belt, push the movable flange inwards, and turn it so that the recess giving the particular gear required is engaged. It would be necessary, we should imagine, to keep the boss, on which the flange slides, well greased. The pulley may be obtained from Mr. A. Mabon, Woodside Gardens, Bruce Grove, Tottenham.

A PECULIAR MACHINE OF ENEMY DESIGN.

THE strange looking motor cycle here illustrated is a German effort in design. The attachment at the side is a kind of bath-chair seat, and from this the machine is steered by a tiller, which incorporates a magneto cut-out, operated by twisting the shovel-handle grip. All the other controls are attached to various parts of the tank.

The engine is nominally of 3½ h.p. with the inlet valve in the overhead position. A long tappet rod which operates this valve is taken through the induction pipe with great disregard for the latter's essential air-tightness.



A belt-cum-chain driven machine of German manufacture captured by our Forces in Mesopotamia.

Ignition is by low-tension magneto, which is fitted to the underside of the bottom bracket in an inverted position. In place of the usual spark plug a mechanical make-and-break projects into the cylinder, and is operated by the piston striking a cranked lever.

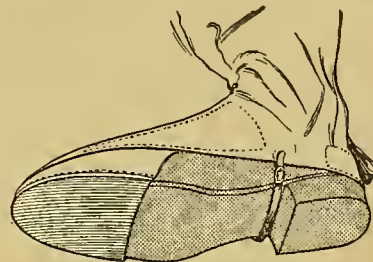
Splash lubrication is used, the extension arm for operating the pump lying along the top tube. Means of cooling the engine while stationary are provided by a fan attached to the engine pulley which forces air up a metal cowl arrangement against the fins. 24in. wheels are fitted, with front and rear brakes of the contracting band type.

Transmission is by 1in. belt from the 6in. engine pulley to the countershaft clutch pulley, which is 10in. in diameter. The final drive is by exposed roller chain running on fourteen tooth and fifty-six tooth sprockets respectively. Levers on the tank operate the valve of the car type carburetter and the clutch lever.

We are indebted to Lt. W. B. Smith, A.S.C. (M.T.) for the photograph and particulars.

IMPROVING THE OVERALL.

RIDERS whose footrests are not completely guarded from mud will find a device similar to that illustrated below quite invaluable. It is simply a toe-cap of leather made to fit the boot, and stitched on the existing overall. The sole of the toe-cap is of strong sole



An improvement to the conventional overall devised by Mr. V. A. Holroyd.

leather, the sides being stiffened by a lighter weight strip of the same material. This keeps the part of the overall covering the instep securely in contact, and prevents ingress of water and mud into the lace-holes. Mr. V. A. Holroyd, of Messrs. Rudge-Whitworth, Ltd., has treated his overalls in this manner, and submitted them for our inspection. It is unquestionably an improvement on the usual type of overall.

AN AUSTRALIAN CLUB RACE MEET.

SEVERAL local records were made at the beginning of this year by members of the Motor Cycle Club of South Australia. The races, which occupied two days, were held on Sellick's Beach, the surface of which was perfect, and a slight wind favoured the riders.

On the first day a mile handicap was run off, with the following result:

1. A. V. Smith (Excelsior), handicap 6s.
2. E. Ferguson (Indian), 1s.
3. W. H. Hubbard (O.H. Wyatt-Jap sc.), 17s.

A mile solo and a mile standard touring passenger races were held over a measured mile, and electrically timed. The results are tabulated below:

SOLO: CLASS 1, up to 300 c.c.

- | | |
|---------------------------------------|--------|
| | m.p.h. |
| 1. E. Warren (Elliott-Villiers) 76s.* | 47.37 |
| 2. F. G. Rong (Victor) ... | 82½s. |
| 3. J. Wells (Victor) ... | 91½s. |

CLASS 2, 301-350 c.c.

- | | |
|--------------------------------|--------------|
| 1. A. McKee (Kent) ... | 60½s.* 59.40 |
| 2. C. S. Lindsay (Douglas) ... | 62½s. |

CLASS 3, 351-600 c.c.

- | | |
|--------------------------------|-------------|
| 1. D. Cameron (Norton) ... | 56s.* 64.28 |
| 2. H. Hirtle (J.A.P. twin) ... | 56½s. |

CLASS 4, over 600 c.c.

- | | |
|------------------------------------|--------------|
| 1. E. Ferguson (Indian) ... | 38½s.* 93.76 |
| 2. A. V. Smith (Excelsior) ... | 41½s. |
| 3. W. Hubbard (O.H. Wyatt-Jap) ... | 43½s. |

A MILE PASSENGER STANDARD TOURING RACE FOR BARNET "GLASS" SILVER CUP.

- | | |
|---------------------------------|--------------|
| 1. A. V. Smith (Excelsior sc.) | 49½s.* 72.30 |
| 2. E. Ferguson (Indian sc.) ... | 52½s. |
| 3. P. J. Coe (Indian sc.) ... | 56½s. |

*Local records.



THE MOTOR CYCLE AND THE INDUSTRY, AS SEEN BY "THE TIMES."

BY THE WRITER OF "THE TIMES" ARTICLE.

Recently we took exception to certain statements in an article in "The Times." The writer of this article now replies to our criticism. Further editorial comment is given on the next page.

I AM very glad indeed to see that *The Motor Cycle* of February 6th, in spite of disagreeing with some of my statements, has done me the honour of quoting quite a nice little bit from an article of mine in *The Times*. Had I not been ill in the meantime, I would have taken an earlier opportunity of replying to the criticism which has been applied to my strictures.

"The motor cycle is abominably and unnecessarily noisy," I wrote. I shall have no hesitation in re-expressing the same sentiment over and over again, until it begins to be borne in upon the motor cycle rider and the motor cycle manufacturer that such, in the great majority of cases, is an easily demonstrable fact. Anyone who lives as I do, on one of the great roads leading out of London, knows this perfectly well; frequently in the otherwise silent night his sense of hearing is made acutely aware of it. I used the adverbs in question because they represent my considered and restrained opinion, which, in view of the fact that I have ridden and owned a large number of machines from 1901 up till the present day, is not by any means that of one who is in any way opposed to motor cycling. On the contrary, in other articles in *The Times*, I have expatiated upon the virtues of the motor cycle and endeavoured to reflect my own enthusiasm for it as a means of transport, both for business and pleasure, but because I am alive to its many virtues is surely no reason at all why I should shut my eyes to its vices. Did I do so I should certainly fail in my duty as a critic with the avowed intention of writing for the education of the public, and for the encouragement and, when necessary, the castigation of the motoring industry. If I can draw attention to the needless and deplorable noisiness of the average motor cycle, it is conceivable that a rather larger number of buyers will demand a greater degree of "silence," and the usual inter-effect of supply and demand will in consequence exercise a beneficial influence.

Does Noise Mean Power?

Now I freely admit that the difficulty of thoroughly silencing a single-cylinder engine is very real, but it is by no means insuperable. It was, for instance, done quite well on the 8 h.p. Rover car many years ago (although, even in this case, it could have been done much better), and I am also prepared to admit

that in the case of the present day single-cylinder Sunbeam motor cycle, the silencing is carried out very well indeed. But this only shows that it *can* be done: it does not in the least repudiate my statement that "the (understand 'typical') motor cycle is so-and-so noisy." I grant that motor cycle manufacturers are not entirely to blame, because very frequently riders make a point of eviscerating the manufacturer's idea of a silencer, or else do away with it altogether, and attach a long open pipe, that makes a meek little twin roar away like any Brooklands racer. But it is surely the duty of the manufacturer, and a duty that he owes to the non-motor cycling public, to design silencers which do muffle the exhaust without absorbing a great deal of power. I am confident that open exhausts (fingers seem to be freely snapped at the law on this point) are used not so much because they make a noise, but because they do enable more power to be got from the engine. So long as this is the case manufacturers must bear the brunt of the blame, and the more so because even when noise is the desideratum of the rider, it is nearly always because he prefers (and I agree entirely with him) the crisp bark of the exhaust to the rattle of chains and the clatter of valve gear. By a parity of reasoning a German band is rendered quite agreeable in a boiler factory.

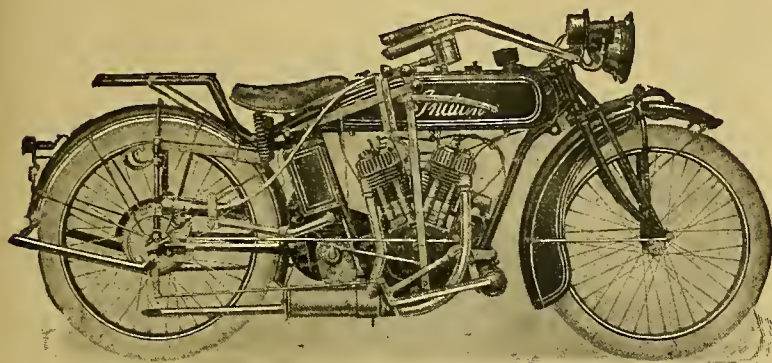
Engineers and—Others.

I furthermore consider that my strictures—which I am perfectly certain will be accepted by the vast majority of people, though not necessarily so by the vast majority of motor cyclists—are justified in this respect that so few determined attempts have been made by manufacturers to make any research into the cause and formation of noise and to cope with it in the light of their experimental results. When I said "the two-wheeler . . . is inclined to be the product of the cycle mechanic rather than the engineer," I had this very point of noisiness, amongst others, in mind. Engineering science, well served by a laboratory under the guidance of skilled and enterprising brains, can accomplish almost anything—it is impossible to set limitations to what can be done with present-day resources and information, leave alone those of the immediate future, and if a perfectly silent motor cycle were put on the road it would be but a small achievement alongside some of the things which have been

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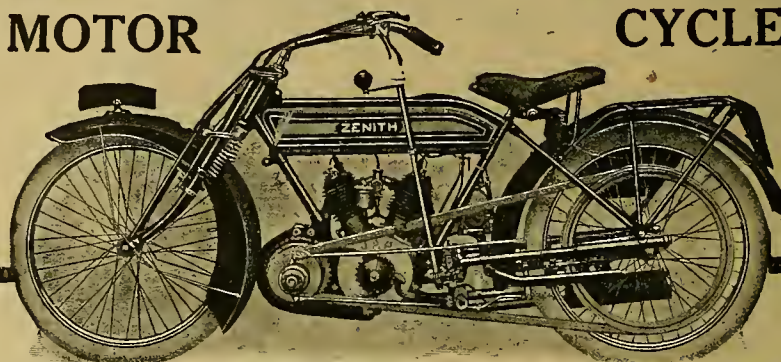
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DEEDS, NOT WORDS.



Peterborough, 26/2/19.

To Messrs. Vivian Hardie, Ltd.

Dear Sirs,—Thanks for the little nut. 8d. herewith to settle.

May I put on record that my transaction with you over the purchase of a "Douglas" was carried through on your part on straight business lines; furthermore, you made a definite promise as to delivery and kept to it absolutely.

Probably **SOME** other firms are prepared to do as much for their would-be customers.

Certainly—I speak from recent experience—**ALL** other firms are not prepared to do as much for their would-be customers.

It seems to me that you are out to do business, not to do your customers. Yours sincerely

(Signed) Lieut. R.A.F.

(Original of above letter may be seen at our offices.)

If you are interested, call and see us.

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The Motor Cycle and the Industry.—

done during the war. I cannot understand *The Motor Cycle* tacitly adopting the attitude that "we must not expect too much." We cannot expect too much. The more we expect—and demand—the more we shall get, and no possible good purpose can be served by what I may call the inter-linear suggestion that what we have is as good as we are entitled to have, and that any excuses are equal to explaining away the shortcomings to which one is entitled to take published exception.

As to engineers and cycle mechanics, the difference between the two is that the one is a scientist and the other is not. I do not say that all motor cycles are produced by cycle mechanics, but I do say that a great many are not produced by engineers. The mere assembling of finished engines and gear boxes, the building of wheels, and the enamelling of frames do not constitute engineering, and no one can deny that a very large number of motor cycles are produced under these conditions. But as to noise, it is notable that, with one marked exception, machines which emanate from manufacturers who have tackled the motor cycle on genuinely engineering lines are better than those which are assembled of "standard" parts.

The Motor Cycle Industry.

"Important and powerful firms are taking charge of its (the motor cycle industry's) interests." This statement *The Motor Cycle* criticises as quite unwarranted, and the reference to important and powerful firms taking charge as erroneous and unfair to the British industry.

The statement can hardly be unwarrantable, because it is literally true. In the past we have had dozens of different little manufacturers employing anything between fifty and a hundred hands and contriving to make, and catalogue, about half a dozen different models. If motor cycle manufacture is to remain a sound industry, and if Great Britain is to retain the position in it which she has won, it is quite obvious that this sort of thing "will not do." More than one important and powerful firm has perceived this, and at last motor cycles will be got out in this country on a really sound production basis. Is it not reasonable

to assume that, under the stress of competition between really big firms, with gigantic interests at stake, the progress of motor cycle design will be more rapid than ever it has been under the bad old conditions? I think so. I also think that it will be very remarkable if more than two-thirds of the firms at present making motor cycles in this country are still making them—and motor cycles only—for their living in five years' time.

EDITORIAL NOTE.

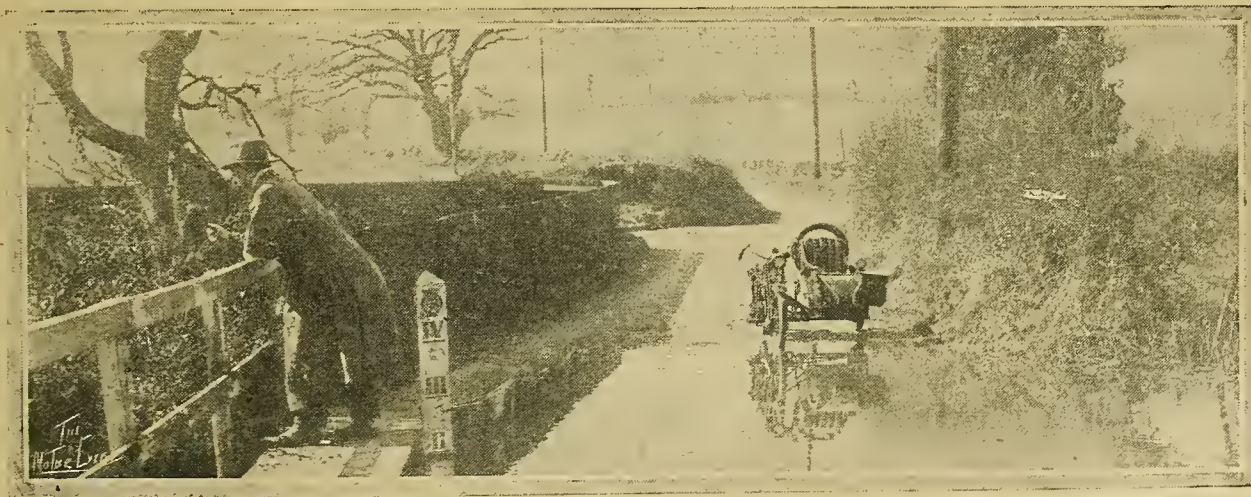
We considered it unfair to the British motor cycle manufacturer for the author to refer to him as "a cycle mechanic rather than an engineer." The statement that "this state of affairs will rapidly change now that important and powerful firms are taking charge of its (the industry's) interests" we said was erroneous and unwarranted. We did not comment upon the question of noisiness raised by *The Times*, as we fully appreciate that there is room for improvement in this direction, and have very frequently referred to the matter in *The Motor Cycle*.

The writer of *The Times* article in the foregoing appears to be under the misapprehension that we tacitly defend the motor cycle on this point. He proceeds to state that he cannot understand *The Motor Cycle* tacitly adopting the attitude that we must "not expect too much." We are content to leave it to our readers, both makers and riders, to decide whether we have ever adopted this attitude. Frequently we have been told that we have "forced the pace," but agree that but for our fifteen years' campaign in favour of more efficient machines progress would not have been so rapid.

The Times contributor now writes that "I do not say that all motor cycles are produced by cycle mechanics, but I do say that a great many of them are not produced by engineers. The mere assembling of finished engines and gear boxes do not constitute engineering."

We did not raise any question on this latter point, neither had we the "assemblers" in mind when mentioning that his statement was unwarranted. We referred to his inference that the motor cycle maker in the past was nothing more than a cycle mechanic, and that in the future "important and powerful firms were taking charge." We said the statement was erroneous and unfair to the British motor cycle industry, because the backbone of the industry to-day is the same as has been responsible for the development of the motor cycle in the past. True, one new firm has entered the field, a concern which has taken over a pre-war goodwill; otherwise the industry remains as it was before the war, with the exception that the output facilities are increased.

We would also point out that the engines and gears used are designed by specialists, who are as much engineers as any of the leading firms manufacturing throughout.



In many watersplashes the A.A. has erected posts to indicate the depth of water, and many times they have saved motor cycles and cars from being stuck in a stream that has belied its shallow appearance. The one illustrated is situated in a ford near Codicote, Herts.



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle" Herford Street, Coventry, and must be accompanied by the writer's name and address

RUSTLESS STEEL.

Sir,—I am interested to see that this steel can be treated to 100 tons, and should like to know if, when so treated, it would be suitable for the same duties as B.N.D. and similar steels. I took my figure for the tensile of this steel from the Air Board specifications, and have seen a good deal of the comparative qualities of rustless and tungsten steels for exhaust valves of aero engines. As regards absence of deformation, I cannot agree with Mr. Brearley, as we had for one aero engine to use thicker heads with rustless than tungsten, owing to deformation. We also had other troubles with the rustless steel which did not occur with tungsten, so that my remarks on the comparative qualities are based upon experience.

I may say that I have also been using tungsten steel valves in a car for 3½ years.

I do not want to decry rustless steel at all, as my experience is that for all round work for exhaust valves it is as good as tungsten, but for a very hot engine I would prefer the latter. This is also the opinion of Capt. L. Aitchison, R.A.F., in his paper on exhaust valve steels, read before the British Engineering Standards Association, last June.

ERIC W. WALFORD (Capt.).

A.C.U. COMMITTEE.

Sir,—Those of us who have worked strenuously before and during the war to make the A.C.U. a great national democratic body, keenly alive to the interests of its members and determined to fight for their rights when occasion demands, cannot be other than grateful to Maj. Axford for his generous recognition of what we have achieved, as also for his very able appeal for a larger membership, and, what is even more important at the moment, for the selection of the right men to serve on the committee about to be selected.

The motor cycle movement is on the eve of a very great development. In my opinion a million motor cyclists in Great Britain is by no means an impossible number to contemplate, as soon as machines can be made in quantities to meet the demand.

If we can get the majority of them into one organisation it will indeed be a force to be reckoned with, both by politicians and profiteers, and we may expect to be strong enough effectively to resist any suggestion of unfair legislation or excessive charges, whether the latter be for petrol or any other of our needs.

We cannot succeed in making the A.C.U. as powerful as it ought to be, unless we can satisfy the provincial motor cyclists that it is, in fact, and indeed, a national body; and not one run by Londoners for Londoners. The best way of doing this is by securing the election of as many provincial members as possible to our committee, which is the Parliament of the movement.

I personally question the practicability of holding committee meetings at more than one centre, and London is certainly the most convenient centre for all parts of the kingdom, by reason of its train service from all parts. Given, however, that provincial representatives have their out-of-pocket expenses paid, as is just, I think, we ought to secure their regular attendance at our monthly meetings in London. Supplement this by the development of local branches of the A.C.U. in the more important centres and by regular "open" meetings for discussion, say, once a quarter, in each such centre, and we ought to get a virile organisation—national in the true sense of the word—working for our interests at all times. I am not sure that Mr. E. B. Ware's list of suggested candidates for election goes quite far enough in the direction indicated, and I would like to see, as you suggest, a stronger representation from the provinces, but it is "up to" the provincial clubs to secure this result, now that they have the opportunity.

Further, may I say that we need as much "new blood" as possible—keen, young, active motor cyclists. The older, staid element is fully represented, and, I hope, always will be, but it should not predominate.

Also, we must never forget that the A.C.U. is essentially a private owner's organisation, and private owners should always be in an overwhelming majority on the committee, although, in my opinion, a certain number of so-called "trade" members should also always be there, for, given the right men, they are a real source of strength and helpfulness to the committee on innumerable occasions. The committee should be representative of all sections of society and not preponderatingly of one.

May I therefore close this somewhat too lengthy letter by urging A.C.U. members everywhere not to lose this opportunity of electing a really strong fighting body of committeemen. If we older members have not done our duty, do not re-elect us. If, on the other hand, you think we have done our best, then support us; but, in any case, see that we are strengthened in the manner above suggested, and remember that the members will get just the committee they deserve to get—no better and no worse—and it will be of no use grumbling after the event.

OTTO THOMAS.



Trying the weight of the new A.B.C. A full description of this machine was given on pages 242 to 244 last week. In this issue a report of its behaviour on the road will be found on pages 275 and 276

STROKE-BORE RATIO

Sir,—It is not often I find a mistake in your paper, but in your description of the new Clyno you say that the stroke-bore ratio of 4 to 3 is the highest of any British twin. You have evidently forgotten the 5-6 h.p. Ariel, the stroke-bore ratio of which was $4\frac{1}{2}$ to 3, viz., 67×95 mm.

I owned one of these in 1914, and found it the coolest running and most powerful engine of its size that I have ever handled.

I O 685.

B.E.F.

FROZEN OIL.

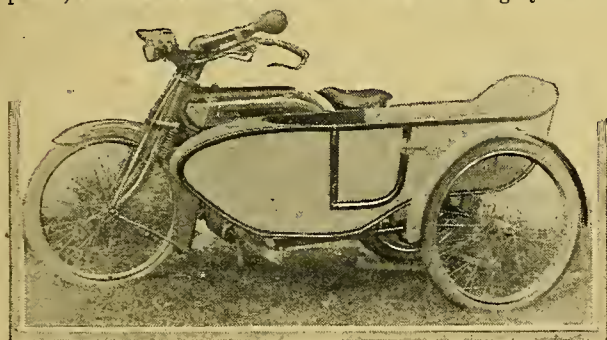
Sir,—Recently I was driving on a frosty day when my machine, a Triumph, suddenly began to knock very badly indeed. Thinking I was not giving the proper amount of oil, I pumped several pumpfuls, as I thought, into the engine, but the knocking still continued and, as I was pulling a sidecar and passenger, it naturally made me very curious as to the real cause. On dismantling the cylinder, I found the crank case had very little oil in it, and the cylinder walls and piston were bone dry. When I dismantled the oil pipe I found I could get no oil through as it evidently had frozen. What I should like to hear from either an experienced engineer or rider is, what objections there could possibly be to placing the oil tank at the back, as the oil pipe would then get some little heat from the cylinder, and could enter the crank case at the back of the cylinder. It speaks well for the Triumph that the engine was none, the worse.

J. SIMPSON.

EASY STARTING.

Sir,—I have lately been using the petrol system on my two-stroke Clyno in preference to the drip feed lubrication which is fitted.

It occurred to me that I might use the now useless oil tank for petrol and use it for injections, so now when starting up from cold I simply give half a pumpful of petrol, and the machine starts as if it were thoroughly warm.



A 1915 Clyno two-stroke with hand-controlled clutch. The sidecar is a Henderson Model A featherweight. (See letter R. B. Brittain.)

I hope this tip may be of some use to your readers, as it saves slopping petrol about when starting, and is no trouble at all.

R. B. BRITTAİN.

SIDECAR BRAKES.

Sir,—It is with much disappointment I have observed the neglect of improved braking power for heavy sidecar combinations. In my opinion, no heavy outfits at present on the road are fitted with brakes enabling the driver to have absolute control on a hill of, say, 1 in 6, or to pull up really quickly on anything of a slope.

We are apparently to have better engines, spring frames, detachable wheels, etc.—all most desirable things—and yet the essential—safety—is neglected. The much-boomed post-war models of several of the biggest and most famous concerns have recently been announced, and in every case (A.B.C. alone excepted, and this is a lightweight) we are to have the same bicycle type front rim brakes. No single braked wheel, however well designed, is sufficient to hold a heavy outfit with, say, two or three passengers and luggage. The Enfield type front brake is better, but even that is insufficient.

Cannot we have a really good sidecar wheel brake? That, in combination with a good rear wheel brake, would give

adequate braking power and a sense of security now sadly lacking, and it should surely be possible to avoid the difficulties in application, which, I suppose, caused its lapse from, e.g., the Rover Co.'s specification.

If you will use your influence in this supremely important matter, you will earn a large increase in the already considerable gratitude borne towards you by

J. Birmingham.

IN DEFENCE OF THE HUB GEAR AND BELT DRIVE.

Sir,—Much may be said in favour of the countershaft gear, but one strong point in favour of the hub gear, which I have never seen advanced, is that in the case of a belt or chain-cum-belt drive it is technically correct, inasmuch as the belt is not subjected to the extra power given by a reduction of gear. [This point has been mentioned again and again in our columns.—Ed.]

It will be seen, then, that in the one case belt slip is counteracted, while in the other it is accentuated.

Now the chief fault, if not the only fault, of belt transmission is slip, which brought into being the all-chain drive, and with it the countershaft gear; and I submit that, whatever the advantages claimed by this combination, nothing can be sweeter, neater, or cleaner to handle than a belt on the final drive, and where this is used the hub gear should be retained, because the pull on the belt remains fairly constant. The countershaft lends itself better to the kick starting gear, and claims reliability in the size and strength of its gear wheels. There is no reason, however, why the hub gear should not be made substantial, and, given this, it is all that can be desired in reliability.

I submit also the advantage of a large hub in respect of spoke strain, where the wheel is driven from its centre, and that it should be considered undesirable to carry this weight directly on the wheel, instead of through the frame, does not conform with my view or experience. This I consider in its favour, and would like the experience of others, but surely the strength of a bridge is governed by the load in the centre of its span, and that same bridge is that much the stronger when the load is on its piers. Similarly, then, a bicycle frame must be stronger, or could be made lighter, if weight be carried where it counts least.

M.R.C.

Caversham.

MAKERS AND PROMPT SERVICE.

Sir,—Your correspondent "Lieut.," Leeds, in your issue of February 6th, mentions the first-class business methods of the Hendee Co. On the other hand, correspondents have complained at various times of the unbusiness-like methods of some British firms, which would give one the impression that it is a common failing. However, it is not so, for there is one firm, at least, in "Lieut's" own county, whose methods of conducting business are exemplary. I refer to the Scott Engineering Co., of Saltaire.

Though engaged, like the majority of other firms, on important Government work, they can, and have, always found time to reply to any communication, and to supply any "spare" required by return; also, they take infinite trouble to put a rider right when he has met with any little difficulty in the running or adjustment of his mount.

Having personally experienced such satisfactory service from Messrs. Scott, I think it should be more generally known that there are at least a few first-class British firms who are equal to the much-lauded American concerns in business methods.

I have no interest in the Scott Engineering Co. other than as a satisfied owner.

If your correspondent "R. R. Richardson," in the same issue, objects to the Scott merely because it is water-cooled, and has a rather higher petrol consumption for its horse-power, they are but poor objections.

The advantages of a water-cooled machine that is a real engineering job, plus the disadvantage of a higher petrol consumption, more than compensate for any advantages of a hot running, noisy, single-cylinder two-stroke.

However, it would certainly be interesting to hear the evidence for and against a long stroke, two-cycle engine.

It is strange that the majority of two-strokes have a stroke-bore ratio of approximately 1:1—in the case of the Scott, the bore is actually greater than the stroke. It is evident there must be sound reasons for makers adopting such a stroke-bore ratio for their two-stroke engines.

C. F. EDMUNDS.

ELECTRIC LIGHTING BY DRY BATTERY.

Sir,—I have read the article by "F.B.S." in your issue of January 16th, also "Practical Engineer's" protest, in your issue of February 13th. "F.B.S." is presumably a non-technical rider as "Practical Engineer" suggests, but his article is interesting, and, generally speaking, represents what a good dry battery will accomplish.

"Practical Engineer" is himself right off the track when he attempts to take up the position of an expert on dry batteries, and although his remarks might have been more or less correct twenty years ago, they are far from correct to-day; if he would like to make the acquaintance of a dry battery which will last for two years, and has in many instances lasted for five years or more on bell and telephone circuits, I shall be pleased to introduce him.

Dry batteries are eminently suitable for motor cycle lighting, and when a suitable combination of battery, lamps, and electric bulb is employed, most satisfactory and economical results are obtained. Cleanliness, readiness, reliability, a reasonable riding light, and no tinkering or cleaning, appeal to many riders who are not out to blind or dazzle all other users of the road. "Practical Engineer" has been unfortunate in the selection of the make of dry cells with which he has obtained his experience, and seems to be mixing up batteries suitable for Faradisation with those suitable for electric head lamps.

I agree that "F.B.S." has probably overstated the case in regard to both candle power and current consumption, as under such conditions of discharge, viz., $1\frac{1}{2}$ ampere, no dry battery of a size suitable for carrying on a motor cycle would give economical results; it is probable that "F.B.S." has mistaken the markings on the bulb and miscalculated the consumption accordingly.

Dynamo lighting is, of course, the ideal outfit, but until that is perfected and brought within the reach of the average rider, electric lighting by dry batteries or accumulators, according to the conditions and requirements as to light, will still hold the first place. I could give "Practical Engineer" examples where dry batteries in their tens of thousands have been used for quite heavy discharges for war purposes both afloat and ashore, which might, perhaps, surprise him. Although interested in the dry battery of another make than that referred to in the letter from "F.B.S.," I feel obliged to vindicate the general use of dry batteries for motor cycle lighting. A. H. HUNT.

REAR LIGHTS ON CYCLES

Sir,—Perhaps the most damaging evidence against the retention in any form of the temporary war-time regulations regarding rear lights on cycles, etc., is to be found in *The Motor Cycle* for March 6th, wherein, on page 219, the following serious admission is made: "When one is expecting rear lights on every vehicle, the absence of them on a road should mean that the road is clear of wheeled traffic—the presence of an unlighted cycle is then more disconcerting than if no rear light regulation were in existence."

This is precisely what the opponents of the rear light have been urging in support of their contention, and it makes it essential that no stone should be left unturned to secure a *status quo ante bellum* with the least possible delay.

The assumption that because there is no light the road is clear for the motorist is against all reason and common-sense, besides endangering the lives of other road users and at once placing a premium upon reckless driving, and in this connection the pedestrian is likely to come off worse than all. Since it is given to none of us to see from the backs of our heads, and therefore impossible to guarantee that a lamp once lit will not go out without calling attention to the fact, it follows that the motorist who drives on the assumption referred to does so with the full responsibility for any "accident" which may occur as a consequence, regulation or no regulation. Further, in the knowledge that "dead men tell no tales," we may fairly surmise that the rear light will certainly not be alight *after* such "accident," and, in any event, it would be impossible for the cyclist to prove that it *was*, as he probably would not have seen it since starting out on his journey.

It is significant that, although motor cyclists are similarly affected as regards this rear light nuisance they have done nothing towards helping forward its removal, and will have to thank the cycling bodies for any benefit which they may indirectly share through their campaign in this direction.

Surely there is a Gilbertian touch about the fact that, on the same page as you advocate the retention of the regulation compelling cyclists to carry rear lamps you are agitating for the removal of another "wartime" imposition—the tax on petrol!

CECIL W. COOKE.

[We cannot agree with our correspondent that because a law is often broken it should necessarily be repealed: Moreover, we did not suggest, and we think Mr. Cooke know it, that motorists should drive rashly when the absence of lights suggested a clear road. Also, it is a fact that an unlighted cycle is, for some reason, harder to see than a pedestrian, and less able to avoid passing traffic. We commend Mr. Cooke's attention to the letter written by Mr. W. J. Sheppard, and published on page 261, March 13th. The insinuation in the third paragraph may be ignored.—Ed.]

WHAT SHALL WE WEAR?

Sir,—I am afraid Phyllis Vernon has not done much winter riding, or she would have had the uncomfortable experience of rain trickling down her neck, also chilled fingers. I think all motor cyclists will agree with me that no coat or gloves will keep rain or cold out when one has to do six or ten hours' riding.

I have now done three years' motor cycling, on an average seventy miles per day, all weathers, country riding; and my ideal dress consists of breeches, woollen coat, leather coat, good rainproof coat, and hat such as A.S.C. girls wear, which I prefer for comfort, having tried all others; also strong boots and leggings.

Previous to 1916 I could not turn a nut. Since riding I have done all my own running repairs; also I am an ardent reader of *The Motor Cycle*. (Mrs.) K.S. Chiswick.

LOSING ONE'S PROP.

Sir,—I notice that "Torque," in your issue of February 27th, asks me to name "any engine of any service type" which a pilot can *not* restart by diving after losing his prop.

As has been pointed out by a gentleman writing in your issue of February 20th with reference to "Torque's" article, under ordinary conditions it ought to be impossible to lose one's prop. with a stationary engine, as the throttle of a stationary engine ought to be slightly open when the control lever is in the extreme closed position. This naturally means that the engine can only be shut off completely by using the magneto switch. Every case of losing the prop. with a stationary engine that comes within the present writer's experience has been caused by excessive wear on the metal block that prevents the control lever from completely closing the throttle, or else binding of the throttle control wires. "Torque's" way of speaking would lead one to think that cases of losing the prop. on stationary and rotary engines are quite on a par. The very reverse is the case.

If "Torque" is thinking of some unconventional engine fitted with half-compression device or its equivalent, he may be right in saying that a dive would restart the engine. The same applies to engines fitted with electric or compressed air starters. Otherwise, I cannot see that the "friction of the air on the propeller" could overcome the high compression usual in aero engines.

I hardly think it necessary to give a long list of the stationary engines I do not consider to be equal to a restart by diving, but I will do as "Torque" asks and give him an example—the 345 h.p. Rolls-Royce. REVS.

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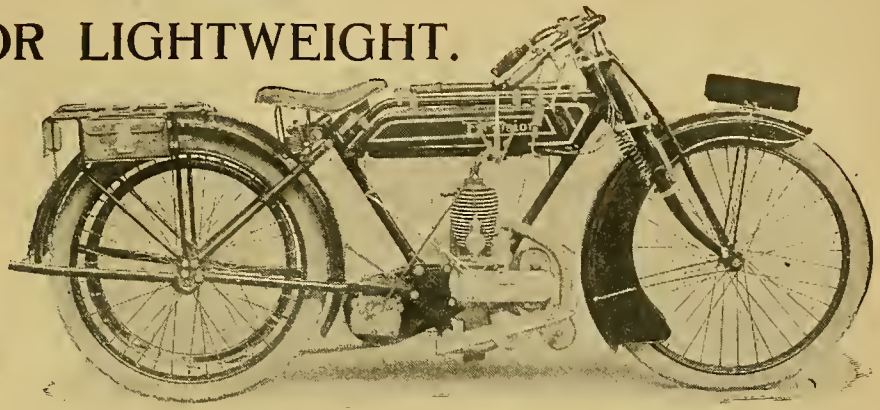
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or of leading Booksellers and Railway Bookstalls.

THE EXCELSIOR LIGHTWEIGHT.

The First of the 1919 Models of Bayliss, Thomas and Co.

ONE by one the well-known makers are re-entering the motor cycle field with new or revised models to satisfy immediate demands. The first of the 1919 British Excelsiors to materialise is a Villiers-engined lightweight, which we illustrate here. This is the first time an Excelsior has been marketed with a Villiers engine. As on the majority of this year's lightweights, the tyres are 26in. x 2½in. Three models are to be offered, a single-gear machine at £50, a two-speed at £56, and one with two-speed gear and clutch at £60.



The 1919 2½ h.p. Excelsior. The Villiers two-stroke engine is fitted.

THE TOOL KIT.

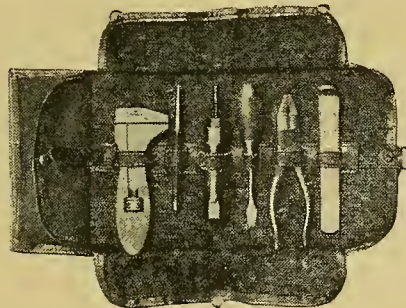
Three Useful Sets for Buyers of Second-hand Machines.

FEW items in the motor cyclist's equipment are more important than the tool kit. It is essential that the owner of a motor cycle should have enough tools of the right quality to enable him to make any adjustments which may be found necessary from time to time.

In the past, the motor cycle makers have got into disrepute owing to the inadequate tool kit they supplied with their machines, but, at the present time, there is a decided tendency among manufacturers seriously to consider this question, and very few, if any, additions will be required to complete the tool kits on future machines.

The question of tools usually concerns the buyer of a second-hand machine to a greater degree than the purchaser of a new mount, and as hundreds of machines are changing hands just now, and quite

a large number of them have been bought and sold many times, it is probably true that fully 50% of present-day motor



Toolkit by Jenks, Wolverhampton.

cyclists will require to purchase new tools, because it is not uncommon for a rider to retain the best of his kit on selling his machine.

For these reasons, the three tool kits illustrated here will be of interest.

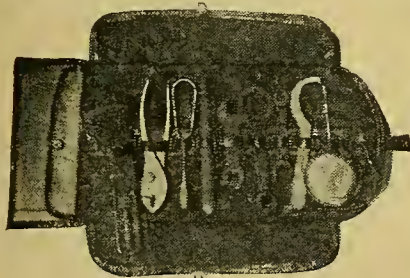
One of these has been introduced by Messrs. Maude's Motor Mart, 100, Great Portland Street, London, W.1. The tools are of first-class quality. The C spanner is by Abingdon-Ecco, Ltd., the cycle spanner is a genuine B.S.A., and the adjustable wrench a Lucas. The pliers, screwdriver, file, and the other two spanners, also appear to be of first-class quality.

In addition to the tools already mentioned, it is the intention of Maude's

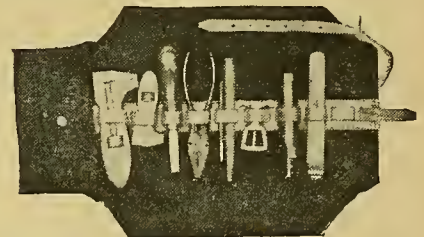
Motor Mart to supply a special set of box spanners with a screwdriver tommy-bar to fit ⅜in., ½in., ⅝in., ¾in., and 1in. nuts.

Another useful tool kit, which is enclosed in double strength canvas leather-bound roll, provided with a useful strap, is by Messrs. Jenks Bros., Ltd., Wolverhampton. The kit includes two tyre levers, an excellent pair of combination pliers, a screwdriver, three box spanners, a punch, and an ordinary large adjustable spanner, while in the pocket provided there is an oilcan, etc. The price is 18s. 6d.

A third set of tools is introduced by Messrs. Tuck and Blakemore, Coventry, and includes two adjustable spanners, pliers, reversible screwdriver, box spanners, file, punch, tyre levers, oilcan, and belt punch. The roll is strongly constructed of canvas with leather band and loops for the tools and a separate outside strap. The price is 25s.



Tool roll offered by Maude's Motor Mart.



The Tuck and Blakemore kit.

FACILITATING EXPORTS.

General, Department of Overseas Trade (Development and Intelligence), 73, Basinghall Street, E.C.2. The annual fee for admission to the Special Register is £2 2s., which includes the supply of *The Board of Trade Journal*.

The Department will, on request, undertake to ascertain from the War Trade Department, and reply by telegram or telephone at the earliest possible moment, whether licences will or will not be granted for orders requiring immediate acceptance. Urgent enquiries should be by telegram rather than by telephone, and

should be addressed to "Orders, c/o Advantage, Stock, London." They should give the quantity, value, and description of the goods comprised in the order and the name and address of the ultimate consignee if the goods are destined for a neutral country. In the case of orders from Allied or British territory, or from territory in the occupation of troops of the Associated Governments, the consignee need not be stated; the country of destination will, of course, need to be given. A reply of twenty-four words (1s. 6d.) must be prepaid.

IN order further to assist exporters to recover their overseas trade, the Department of Overseas Trade, in concert with the War Trade Department, has made arrangements for bringing to the notice of exporters through the medium of the press, trade journals, etc., and by special notes direct to firms on the "Special Register" of the Department, information regarding changes affecting control over exports.

Firms not already on the Special Register may apply for admission to the Special Register to the Comptroller-

Borrowing an Idea from Henry Ford.

A Suggested Cycle Car to be Built on the Lines of the Fordson Tractor.

MOST of us have heard of the Ford tractor for agricultural purposes, and some of us are, more or less, acquainted with its method of construction, which is reminiscent of the old 8 h.p. single-cylinder Rover car. It will be recalled that the Rover chassis was something on the lines of the Ford tractor (which, by the way, is known as the Fordson), inasmuch as the usual frame supporting the engine, gear box, body, etc., was entirely dispensed with, and the rear and front axles were connected by a single tubular construction of cast aluminium.

The Fordson tractor consists, briefly, of two units: (a) the front axle with its engine, clutch, and accessories; and (b) the rear axle, change-speed gear, and differential; the two connected by flanging and bolting the casings together. This construction allows engine, crankshaft, clutch, gearshafts, and transmission to run in an oil bath.

Practically every designer of a motor car chassis is asked to facilitate the methods of lubrication and to simplify the parts. Why not a cycle car on the lines of the sketches reproduced below?

A Single Tube Chassis.

It will be seen that the rear axle and differential of the suggested design form the rear unit, the detail parts to

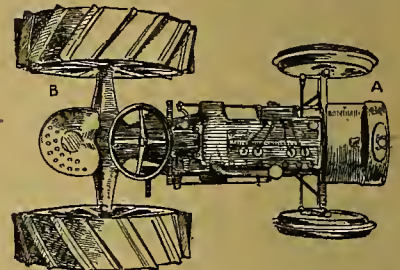
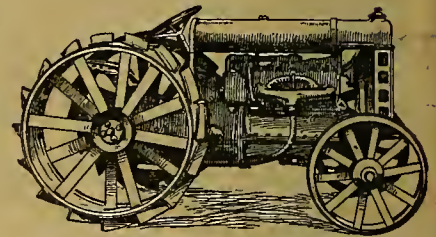
be simplified as much as possible, in order to reduce cost of production, while still retaining the quality of lightness. The engine with its accessories, clutch and gear box, might form the front unit, or the gear box alternately could be part of the rear unit.

Obviating Universal Joints.

Universal joints might be required between the engine and gear box and gear box and rear transmission, but it should be possible to reduce the number of these joints owing to the unit construction.

The advantages of the design are that all moving parts run in oil from front to rear, and one filler conveniently placed would suffice. In other words, the rear axle, gear box, universal joints, clutch, and engine would all receive copious supplies of oil.

Practically the only parts that would require separate lubrication would be the outside axle bearings, front wheel bearings, steering pivots, and the shackle joints of the front spring, and joints of the front radius rods. The steering gear could be designed to pass through a side extension of the crank case, and to be lubricated by the same trough-splash system, leaving the steering rod joints to be separately lubricated by large sized screw-down greasers.



The Fordson tractor, which is much used for ploughing in this country. The design suggested possibilities to our contributor for a cycle car on similar lines.

As regards the front axle and springing, the spring is of the transverse type, shackled at the ends, and radius rods would be fitted to maintain alignment. The objection to the design is that at high speeds it would have a tendency to cause rolling and oscillation of the body, but with a vehicle of the cycle-car type, speeds of thirty miles an hour should not be exceeded. In fact, the writer would design and make the engine to cut out at speeds over 30 m.p.h. by governing it; it would then be difficult to detect rolling. This type of springing, properly designed and carried out, is quite luxurious on rough roads.

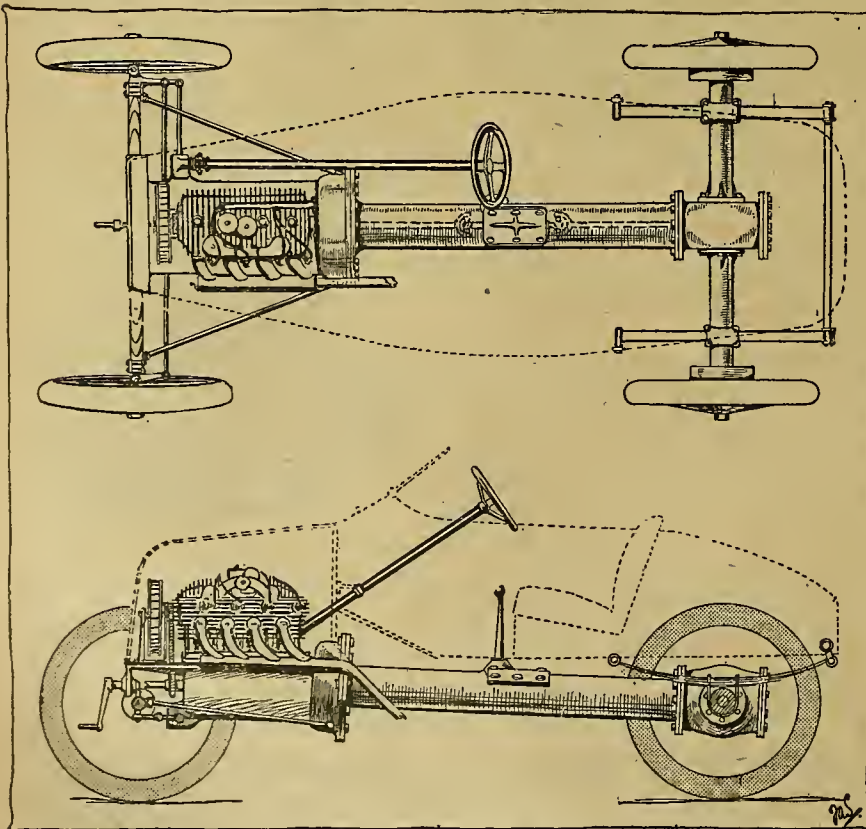
The Comfort of the Passengers.

The front spring clip swivels on a central pin forming part of the crank case, and this is the only support for the engine in front. It is also possible to raise either of the front wheels separately from the ground without disturbing the equilibrium of the chassis.

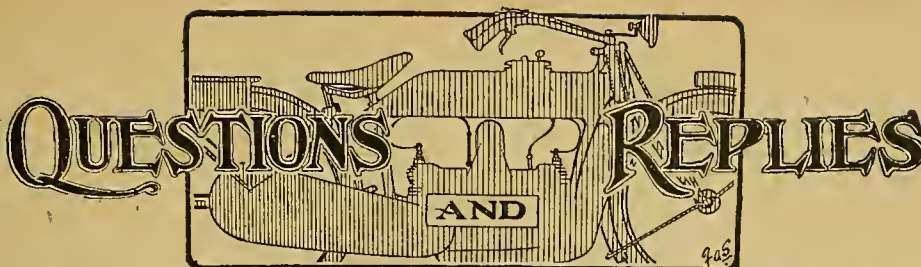
Mr. Parnacott's little cycle car, which was driven by a 5 h.p. F.N. four-cylinder engine, was something on these lines, a wooden box taking the place of the steel tube; but in this case the whole of the weight was sprung, whereas in the suggested Fordson cycle car, at the rear the body would be sprung independently—a principle employed in the Premier cycle car of 1912.

In one respect this suggested design is quite opposed to what is considered ideal car practice. The tendency is for designers to reduce unsprung weight to a minimum, but in this design, probably half of the weight of the chassis would be unsprung, with the natural result that the parts would be subjected to excessive vibration.

MECHANICUS.



Plan and elevation of the suggested cycle car. The engine shown is a four-cylinder, but practically any type of engine could be used. The gear box is in the centre, but it could be combined with the front or rear unit.



QUESTIONS AND REPLIES

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C.4, and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

Chain Bolt Working Loose.

? Is it impossible to have a chain bolt with a hole drilled in it for a split pin instead of the usual nut, which, in my case, has been the cause of many accidents, owing to its working off? To me it seems very strange how our chain makers can be satisfied with such a fastening, when the remedy is so simple. I should be very glad to know where I could have bolts with holes drilled to fit a $\frac{1}{2}$ in. \times $\frac{3}{16}$ in. chain.—D.M.D.

Yes, there are plenty of chain bolts drilled with a hole for a split pin. Any motor or cycle agent with a decent stock of drills should be able to drill a hole for you, unless, of course, the bolt is too hard. An alternative is, after you have fitted the nut and screwed it up tightly, to take two hammers—one heavy and the other a light riveting hammer—place the flat side of the larger hammer against the head of the bolt, and with the round end of the light riveting hammer burr over the portion of the bolt projecting beyond the nut, and the bolt will then be quite secure.

Electrical Conversion.

? I should like to fit an electric lighting set to a small cycle car if it could be done. I should like to use an old Bosch magneto as generator. This magneto is a D.A.V. type, and off a 45° twin-cylinder motor cycle engine. It has just been remagnetised, and is in first-class condition. I shall be glad to have your advice on what alterations and additions will be necessary to make up this set. I am a first-class mechanic, and have lathe and tools at hand.—W.G.F.

You can use the old Bosch magneto as a generator in the way you suggest, and with your facilities for working you will no doubt be able to make a satisfactory job of it. The simplest way is to take off the contact breaker arm, and use the primary winding arm on the armature as an alternator. This will give a small output, probably about six or eight watts. The best way is to rewind the armature. You will thus get considerably more output on account of the winding, which will then occupy all the space formerly filled by the low and high-tension windings. Use wire 23 S.W.G., either double silk covered or enamelled, and get as much on as you can. If you want a continuous current, you will have to fit a commutator; but as it is only a two-part one, it will not cause you much

trouble. While it is not possible to state the exact output from these small generators, you might reasonably expect to get about 2.5 amperes at six volts running at about 2,500 r.p.m., from which quite a useful light can be obtained. If you take out the armature for rewinding, place an iron "keeper" across the magnet poles before doing so, and do not remove it until the armature is returned.

Miniature Plugs.

? (1.) Can you inform me of an insulating material which could be turned or moulded for use in miniature sparking plugs for model work? (2.) Can you give me full particulars of the Beghee igniter?—R.H.C.

(1.) For this purpose we should recommend you to try ebonite or vulcanite. It can be turned in a lathe with care, taking light cuts, and has a very good appearance when well finished. After turning

IMPORTANT NOTICE.

GOODS MADE IN GERMANY.

The proprietors of this journal, being fully in accord with the recommendations agreed upon at the Paris Economic Conference, give notice that they will not permit the advertisements of new goods manufactured in enemy countries to appear in this publication.

ILIFFE & SONS LTD.

has been finished, leaving as good surface as possible, apply two or three different grades of emery paper, taking care not to burn the surface of the work. Then apply a paste of oil and rottenstone on a rag and polish until a jet-black bright surface is obtained, finishing off with a piece of felt or similar material. Penholders are sometimes made of this substance, and you might find this a convenient means of obtaining the material. A short length cut out of a penholder would probably do very well for what you require with a little work done on it in the lathe. (2.) The principle appears to be identical with that used in the Dixie and other magnetos of the inductor type. The movable soft iron core would no doubt be fitted with end pieces at right angles to each other, giving a Z shaped formation. The motion being oscillating would not be so suitable for a high speed engine as a rotating motion used in the above magnetos.

Clutch on Two-speed Model.

? I have recently bought a $3\frac{1}{2}$ h.p. Premier with two-speed counter-shaft gear. All the controls are missing, and I am in doubt regarding the clutch. Where is it situated on this machine?—L.W.
The clutch is within the gear box.

Charging Resistance.

? I should be obliged if you could tell me the candle-power and number of carbon lamps I should require on switchboard to charge a two-volt accumulator off a 220-volt main.—J.H.M.

You do not state the ampere hour capacity of your accumulator on which the charging rate depends. Assuming that the capacity is twenty ampere hours, then two carbon lamps each of 32 c.p., wired in parallel, will give a suitable charging rate. If it has a capacity of forty ampere hours, then double the number of lamps. The light of the lamps will be practically unaffected when in series with an accumulator of only two volts, so that it is quite possible to use some of the lamps of a house supply, thus saving considerable expense in current. The ampere hour capacity of the accumulator will be marked on the label attached to it by the makers.

Fitting a Philipson Pulley.

? I have a 1915 $3\frac{1}{2}$ h.p. Rover combination with Sturmey-Archer three-speed hub gear. It runs well, but I am troubled with knocking on picking up round sharp corners, and also lack speed on the level with present gear, about 5 to 5 $\frac{1}{2}$, which, however, I find is about suitable for main road hills. I am proposing to fit a Philipson pulley, and should be glad of the following information. (1.) Which is the more suitable, automatic or hand-controlled? (2.) Please explain the necessary working of both to reduce the gear in the case of rounding sharp corners. (3.) Do you consider results will justify expenditure?—E.H.L.

(1.) A hand-controlled pulley would be more suitable. (2.) To reduce the gear, the brake is applied on the exterior of the pulley; if no brake is fitted, the boot is applied. (3.) The addition of a pulley would undoubtedly be a refinement to your machine. The knocking and lack of speed are probably due to engine trouble. Perhaps the compression is too high, or the cylinder requires to be cleaned of carbon deposit, and the engine generally adjusted.

Misfiring.

?

I have a 10 h.p. four-cylinder Henderson. A few weeks ago I took the engine down. Since then there has been persistent misfiring in the back cylinder. I fitted new rings to the pistons, and new points to the magneto. The rings and magneto are quite in good order. Yet as soon as I accelerate or get on a hill the rear cylinder misses badly. Can you give me any hint as to the probable cause? I have tried all I know, and am no nearer the solution than I was when it first occurred.—A.H.C.

From what you say in your letter, it seems clear that the trouble is not electrical. We should therefore recommend you to look at the inlet valve, and also see that the induction pipe union of this cylinder is air-tight. Also verify the tappet clearances.

Liability for Fire.

?

I took my Scott motor cycle for repair to a motor engineer, who found that a new crank was required. This part he was not able to obtain, and so he kept the Scott until one could be got. The building in which my machine was stored was destroyed by fire. Is the engineer legally obliged to pay me compensation? The insurance policy which I previously held for the machine had been allowed to lapse before the fire occurred. Also, what do you consider a fair value for the Scott with its accessories? It was bought new by me in July, 1915, and was in excellent condition.—W.H.

The motor engineer is not liable for your machine being destroyed by fire while on his premises, unless the fire occurred through his negligence or the negligence of anyone in his employ. The value of the machine would be about £40.

Timing a Four-cylinder.

?

Would you please tell me the correct positions for timing both the ignition and the exhaust valves of a 5-6 h.p. F.N. four-cylinder machine, 1912?—S.S.

The machine should be timed in the following manner: Turn the crankshaft until the piston of the back cylinder is five to six millimetres from the top of the compression stroke. Unless the slide holder on the crankshaft has been altered, the carbon brush of this will point to the position of the bottom right-hand terminal of distributor, assuming the latter is in position. Now grasp the contact breaker of the magneto, and turn it until the maximum resistance is felt, and slide the magneto gear wheels into engagement with the corresponding wheel on the crankshaft of the engine. Having bolted up the magneto and fitted on the distributor, verify the timing. The points of the contact breaker should commence to separate when the back cylinder piston is in the aforementioned position. The wiring of the distributor in relation to the respective cylinders is: bottom right wire to back cylinder; top right wire to third cylinder from back (or second from front); bottom left wire to second cylinder from back; top left wire to front cylinder. The lengths of

the wires will, in themselves, show which cylinders they go to. Beginning with the back cylinder, the exhaust valve should be timed in the following manner: Set the exhaust valve to close just after the completion of the exhaust stroke. It will then commence to open when the piston is about one-seventh of the length of the stroke from the bottom of the firing stroke.

Using a Rectifier.

?

Is there a satisfactory method of charging accumulators 4 volts 40 amps. from 200 volts alternating current lighting circuit? The electric sundries people list a rectifier, but it charges at a lower rate than the directions on the accumulator state. Would this answer?—T.H.

You can charge your accumulator from the alternating mains through a rectifier, although the latter may give a lower charging rate than that specified by the makers of the accumulator; it will merely take a longer time to charge. The effect of the longer time on the accumulator will be beneficial rather than injurious. If you do not wish to buy a ready-made rectifier, it is possible to construct one on the principle of the Noden valve. Details are given in the new edition of "Electricity and the Motor Car" now in the press, but it consists mainly of an aluminium and a lead plate immersed in a solution of ammonium phosphate. This acts as a rectifier only, and must be used in conjunction with either a transformer or a suitable lamp in series with it to reduce the voltage. In your case four 32 c.p. carbon filament lamps of 180 volts would be suitable, wired in parallel with each other, but in series with the rectifier and accumulator.

Attention to a Clutch.

?

Will you kindly advise me on the following: (1.) My machine, a Rudge Multi and sidecar (1913), runs excellently solo *when clutch is not used*. With sidecar clutch goes in with a "bark," and engine stops, no matter how gently the clutch handle is released and how much the petrol lever opened. Have tried loosening the cone at end of gear and clutch projection, but with no improvement. Rudge booklet does not tell how this may be remedied. (2.) To remove clutch and gear apparatus (for overhauling if necessary) is anything further required than to undo the four exterior nuts?—J. F. GALLAHER.

The trouble evidently lies in the clutch plates. As you suggest, by undoing the nuts on front of the multi-gear you can remove the front part of it straight off the axle. This should be immersed in paraffin. There is no need to remove the Bowden control, and this can be utilised to open and close the plates while in the paraffin. Afterwards shake the paraffin out and put in some engine oil while the clutch is off the axle. Poke a wire through the lubrication holes and see that they are clear. You should note that any initial pressure interferes with the proper working of the clutch.

READER'S REPLY.**Timing.**

With reference to your explanation of "F.W.R.'s" difficulty in timing his engine, in your issue of March 6th, may I suggest that another explanation is possible? I have experienced the very same trouble as "F.W.R.," and found it due to interchanging the valve tappets by mistake, thus causing complete loss of compression.—S. R. POOLE.

EXPERIENCES WANTED:

"J.R." (Walthamstow).—Binks carburettor fitted to a Triumph, as regards slow running and acceleration.

RECOMMENDED ROUTES.**SWINDON TO WITNEY.—S.G.P.**

Swindon, Highworth, Faringdon, Black Bourton, Witney. Approximately 35 miles.

WATTON TO STRADBROKE.—F.H.

Watton, Brockles, Larling, East Harling, North Lopham, South Lopham, Diss, Scole, Stradbroke. Approximately 30 miles.

CREWE TO SURBITON.—T.P.

Crewe, Newcastle, Weston, Rugeley, Lichfield, Colehill, Coventry, Southam, Fenny Compton, Banbury, Aynho, Bicester, Aylesbury, Amersham, Uxbridge, Staines, Kingston, Surbiton.

BRIGHTON TO KNOWLE AND DORRIDGE.—E.S.H.

Brighton, Henfield, Cowfold, Horsham, Cranleigh, Guildford, Worplesdon, Bisley, Bagshot, Bracknell, Reading, Pangbourne, Stratley, Wallingford, Dorchester, Oxford, Banbury, Warrington, Warwick, Wroxall, Knowle.

BRISTOL TO ILFRACOMBE.—S.G.P.

Bristol, Redhill, Highbridge, Bridgewater, Williton, Dunster, Porlock (both Porlock Hill and the avoiding route, on which you have to pay 1s. toll, are in very bad condition, we understand), Countisbury, Lynton, Parracombe, Combe Martin, Ilfracombe. An alternative route is: Bridgewater, Taunton, Milverton, Bampton, South Molton, Barnstaple, Ilfracombe. Approximately 90 miles by the first route, and 110 by the second.

MARGATE (VIA LONDON) TO MANCHESTER.—O. AND A.

Margate, Sarre, Canterbury, Charing, Lenham, Maidstone, Ightham, Wrotham, Farningham, Sidcup, Lewisham, Old Kent Road, New Kent Road, Elephant and Castle, St. George's Road, Westminster Bridge Road, over Westminster Bridge, Whitehall, Cockspur Street, Pall Mall, Regent Street, Oxford Circus, Portland Place, turn left, then right at Baker Street, and straight on *via* Park Road into Finchley Road, then through Golder's Green to Finchley and Barnet, St. Albans, Dunstable, Hockliffe, Newport Pagnell, Northampton, Husbands Bosworth, Leicester, Loughborough, Derby, Ashbourne, Leek, Congleton, Wilmslow, Manchester. Approximately 250 miles.

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ADVERTISEMENTS in these columns—First 12 words or less 2/-, and 2d. for every additional word. Each paragraph is charged separately. Name and address must be counted. Series discounts, conditions, and special terms to regular trade advertisers will be quoted on application.

Postal Orders sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd.**, and crossed **& Co.**

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.4), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge, which must include the words Box 000, c/o "The Motor Cycle." Only the number will appear in the advertisement. All replies should be addressed No. 000, c/o "Motor Cycle," 20, Tudor Street, E.C.4.

DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pays carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged; when under £10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to **Iliffe & Sons Limited**.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

MOTOR CYCLES FOR SALE.

A.B.C.

CROW Bros., High St., Guildford, have contracted largely for the new A.B.C. Order now for earliest delivery. [5298]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery of the new A.B.C. [2254]

LIVERPOOL and District Agents for A.B.C. Place orders now to secure early delivery.—**Victor Horsman, Ltd.**, 9, Parr St., Liverpool. [0003]

A.B.C.—Sole agents for these famous machines. Orders booked now for early delivery.—**Chandler, Revre, and Williams**, Sun St., Hitchin. [0996]

A.B.C. 1919 Models.—Let us book your order for earliest delivery.—**Contracting agents, Elce and Co.**, 15-16, Bishopsgate Av., Camomile St., E.C. [0551]

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ABINGDON 3½ h.p. and Sidecar, perfect, modern; £23/10.—**Hall**, 2, Hockman Cottage, Whetstone, N.20. [5779]

ABINGDON 5-6 h.p. Twin, Jardine 4-speed, Gloria spring wheel sidecar; £65.—**James and Adams**, High Rd., East Finchley. [5736]

A.J.S.

A.J.S.—Early delivery of new 1919 combination; book now.—**Moss, Wem.** [X5919]

A.J.S., 2½ h.p., gear box, kick starter; £40.—**25a, Mount St., Brighton.** [6006]

CROW Bros., Guildford.—**A.J.S. Agents** since 1912. Write us for your requirements. [9777]

1916 6 h.p. **A.J.S. Combination**, spare wheel, lamps; £120.—**J. C. Pickering**, Shrewsbury. [6105]

1919 **A.J.S. Combinations.**—Write **Merrick's Stores**, 174, Listerhills Rd., Bradford. Phone: 2429. [X2430]

A.J.S. Combination.—Book your order now for earliest deliveries.—**Parker's**, Bradshawgate, Bolton. [6138]

A.J.S. 1914 Sidecar, been repaired, complete with all connections; £10/10.—**Box 3,067, c/o The Motor Cycle.** [X5918]

2½ h.p. A.J.S., 1914, 2 speeds, just overhauled, splendid condition; £40, or very near.—**Palframa, Plesley, Mansfield.** [6036]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery of the new A.J.S. [2255]

A.J.S., 2½ h.p., late 1913, 2-speed, hand clutch, chain drive, good running condition; £28.—**180, Crayford Way Crayford, Kent.** [6013]

A.J.S.—For quick deliveries try the sole Leicester-shire agent, **Will Chapman**, 113, Belgrave Rd., Leicester, the first appointed A.J.S. agent. [3531]

A.J.S., 1916, 2½ h.p., 3 speeds, chain drive, foot boards, good condition, just overhauled; £47/10.—**Duckworth**, 45, Cambridge Rd., Southport, Lancs. [5880]

A.J.S. 6 h.p. Twin Combination, 2-speed countershaft, clutch, kick start; £65; seen before 10 a.m. or after 7 p.m.—**Rosemary, Tram Terminus, Ditton, Surrey.** [5933]

A.J.S.—For the earliest possible deliveries of 1919 models, specifications, and super service, try the **A.J.S. Specialists**, **The Walsall Garage**, Wolverhampton St., Walsall. Phone: 444. [4668]

FOR SALE, 1916 2½ h.p. 3-speed **A.J.S. motor cycle**, property of deceased officer, condition as new, only ridden 6 months; price £45.—**Lady Garrod, c/o Page and Girling**, Melton, Suffolk. [5866]

6 h.p. 1915 A.J.S. Combination, spare wheel and tyre, detachable wheels, screen, accessories, and tools, fitted with handsome de Luxe A.J.S. sidecar; £115.—**Also**

2½ h.p. A.J.S., very fast, 2-speed gear, clutch, and 2½ kick starter, broad tank, semi T.T. bars; £65.—**Wauchope's**, 9, Shoe Lane, Fleet St., London. [5977]

A.J.S. 6 h.p. 3-speed 1915 Combination, fitted with a wind screen, hood, collapsible carrier, speedometer; £100; lovely running order, paintwork as new.—**69, Walford Rd., Sparkbrook, Birmingham.** [7675]

A.J.S., late 1914, 6 h.p., and sidecar, speedometer. A spring saddle-pillar, wind screen and hood, recently cost £20 overhauling, in perfect condition; 270, oo offers.—**John Fridlington**, Kew, York. [5894]

1914 5-6 h.p. **A.J.S. Combination**, 3-speed countershaft, kick starter, coachbuilt sidecar, Lucas lamps throughout, all accessories, perfect running order; 90 gns; after 6 p.m. only.—**7, Ravenhurst Av., Hendon.** [X6127]

6 h.p. A.J.S., War Model, late 1918, as new, 3 speeds, hand clutch, interchangeable wheels, 25x3in. tires (still guaranteed), enclosed all-chain drive, kick start, etc., exact model made at present day; price £100, no offers.—**Corfield, Haulier, Newtown.** [5790]

A.J.S. Spares, prompt delivery.—**Cyril Williams**, Chapel Ash Depot, Wolverhampton. Tel.: [9189]

All days.

ALLON, late 1915, 2-stroke, 2-speed, good order; £35.—**Ward**, Hampden, Missenden, Bucks. [5966]

ALLDAYS-MATCHLESS, 3½ h.p., 2-speed, 4-stroke; £33.—**24, Lushington Rd., Harlesden, N.W.10.** [5962]

ALLDAYS Allon, 1915, 2½ h.p., 2-stroke, 2-speed clutch model; £38.—**E. W. Miller**, 153, Lavender Hill, S.W.11. [5768]

ALLON 2-stroke, 2-speed gear, with hand-operated clutch, kick-start; £85; early delivery.—**Parker's**, Bradshawgate, Bolton. [6143]

MOTOR CYCLES FOR SALE.

Alldays.

ALLDAYS-MATCHLESS, 1915, 3½ h.p., excellent order, good tyres, lamps; £40, bargain.—77, Guildford St., Chertsey. [5963]

ALLON 1916 2-stroke, 2-speed, clutch, 2½ h.p., good condition, large exhaust; seen any day; £40.—Hogg, Cedars, Rickmansworth. [5819]

ALLON 2-stroke, late 1915, mileage 1,000, stored 7 years, condition as new; 27 gns.—Call after 7, Pembury, Weston Park, Thames Ditton. [5854]

ALLDAYS Allon, 1917, 2-stroke, 2-speed, clutch model, hand control, fully equipped, good as new, very little used; £44, or near offer.—17, Regent St., Rugby. [X6021]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest delivery 2-speed and clutch Allons, £58; also De Luxe models, with kick start, £65. [2258]

SACKS, motor cycle engineer, has 1914 Alldays-Matchless 2-stroke, thoroughly overhauled; £20.—Alfred Sacks, Motor Cycle Engineer, 39-40, Rednall Terrace, Great Church Lane, Hammersmith. [5797]

1914 4 h.p. Alldays-Matchless, clutch, handle starter, Bosch mag., Amco carburettor, lamps, horn, and spares, stored 2 years, in good condition throughout; £38.—L. Nicholson, Tattenhall House, Hinstock, Market Drayton. [5998]

Ariel.

CROW Bros., High St., Guildford, Ariel agents since 1913, have 1919 models in stock. [5299]

1916 3½ h.p. Semi-T.T. Ariel, decompressor, practically brand new, mileage 300; £51.—58, Ivy Rd., N.W.2. [5865]

ARIEL 1916, big single, 3-speed countershaft, kick start, lamps, speedometer; £58.—29, St. Leonard's St., Bromley-by-Bow. [6159]

ARIEL 3½ h.p. and 6-7 h.p.; early deliveries.—F. Speakman, Ariel Expert, 7, Rochdale Rd., Harpurhey, Manchester. [5269]

ARIEL 2½ h.p., 26×2½ wheels, low, studded tyres, in perfect condition, less mag.; bargain, £15.—54, Hlegate St., Walworth Rd., S.E. [6014]

3½ h.p. T.T. Ariel, 1914, splendid condition, guaranteed 50 m.p.h., complete with lamps; £35; seen any day.—Benger, 7, St. Matthew's St., Rugby. [X5978]

RIDER TROWARD and Co., 31, High St., Hampstead.—New 3½ h.p. 3-speed Ariel in stock, £40. Orders being booked for earliest delivery 5-6 h.p. combination. [2257]

1916 5-6 h.p. Ariel Combination, 3-speed countershaft, kick starter, coachbuilt sidcar, new Dunlops, 2 Lucas head lamps, generators, tail light, horn, all accessories, splendid condition, stored 2 years; 90 gns.; after 6 p.m. only.—7, Ravenhurst Av., Hendon. [X6126]

ARIEL, 1914, 5-6 h.p., 3-speed countershaft, Turner's coachbuilt sidcar with screen and hood, engine being overhauled, and frame, tank enamelled this year by makers, complete with lamps, watch, speedometer, Watford, full kit of tools, spare belt; £85.—Creasey, Aylum, Talgarth. [X5960]

Auto-Wheels.

WALL Auto-Wheel, just overhauled; 9 gns. or offer.—Seen any time, 15, Holland Park Av., W. [5734]

GENUINE Wall Auto-wheel, little used; £10.—Murray, 37a, Charles St., Hatton Garden, Holborn. [X5998]

AUTO-WHEEL, Wall, nearly new, sell less half cost; bargain.—143, Drummond St., Hampstead Rd., N.W. [X6044]

STANDARD Auto-Wheel, good as new, hardly used, cost 16 gns.; sacrifice £6/10.—Pickford, 243, Old St., E.C.2. [5946]

AUTO-WHEEL, B.S.A., attached lady's bicycle, complete; £14/4.—Johns, 27, St. Gabriel's St., Orkneywood. [6040]

AUTO-WHEEL, Model de Luxe, complete, perfect running order, equal to new.—Akrill, 18, Market Place, Beverley. [X4856]

AUTO-WHEEL, 1914 model, complete, and in excellent condition; £15.—The Eastern Garage Co., 418, Romford Rd., Forest Gate, E.7. [5792]

AUTO-WHEEL, good hill-climber, attached strong B.S.A. bicycle, all in good running order, also spares; what offers?—Box L9,774, c/o The Motor Cycle [5456]

AUTO-WHEEL, good running order, £8/8; another, late model, £10/10.—George Smith, Motor Cycle Depot, Clapham Junction. (Opposite Arding and Hobbs.) [5829]

Bat.

5-h.p. Bat-Jap Combination, coachbuilt sidcar, 2 speeds, clutch; £35.—19, Wood Lane, Shepherd's Bush, W.12. [6126]

6-h.p. Twin Bat-Jap, Bosch, spring frame and forks, new tyres, lately overhauled; £32.—Speechley, 1, Gunnersbury Lane, Acton Hill, London. [6032]

6-h.p. 1914 Bat, 3-speed countershaft gear, clutch, and kick start, semi T.T. bars; £73/10.—Wanchope's, 9, Shoe Lane, Fleet St., London, E.C. [5978]

BAT-J.A.P., Twin, 8-10 h.p., N.S.U. gear, and coach canoel sidcar, good condition; £55.—9, The Parade, Cambridge Rd., Norbiton, Surrey. [5919]



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Bat.

BAT-J.A.P., 8 h.p., 2-speed gear box, free engine, clutch combination, kick start, laid up since war, first-class condition; £60.—Collins, Heath Slide Garage, North End, Hampstead. [5940]

BAT-J.A.P. Combination, 6 h.p. twin, Turner coachbuilt sidcar, with hood and screen, 2-speed, kick starter and free engine, very little used, stored during war, perfect condition; £60.—Collins, Heath Slide Garage, North End, Hampstead. [X5856]

Blackburne.

CROW Bros., High St., Guildford, are old Blackburne agents, and can give early deliveries. [5300]

BLACKBURNE—Sole agents. Book now for early delivery.—Chandler, Reyre and Williams, Sun St., Hitchin. [0999]

BLACKBURNE 1919 Models—Let us book your order for earliest delivery.—Contracting agents, Elce and Co., 15-16, Bishopsgate Av., Canonville St., E.C. [0552]

JONES' Garage—We can accept orders for all models of Blackburne motor cycles; delivery expected in April; deposits optional.—Broadway, Muswell Hill. [0992]

Bradbury.

4 h.p. Bradbury, new N.S.U. 2-speed, free, new belt fast; £28.—3, Park St., Wellington, Salop. [X5971]

BRADBURY Coach Combination, 2-speed, pedal start; £38.—29, St. Leonard's St., Bromley-by-Bow. [6156]

4 h.p. Bradbury, 2-speed, free engine, good condition, powerful, Bosch mag.—Reeves, Park Rd., Wellingborough. [5821]

BRADBURY, 1913, 4½ h.p., free engine clutch; £35.—9, The Parade, Cambridge Rd., Norbiton, Surrey. [5918]

BRADBURY, 4 h.p., 1914, new tyres, top feed, B.B., fixed engine, mechanically sound; £30.—Lorraine, The Rise, Sunningdale. [6011]

4 h.p. Bradbury, single speed, splendid condition; £25; seen between 12-4 o'clock.—P. Zensen, 50a, Horner St., Pentonville Rd., King's Cross. [5802]

BRADBURY, 1914, 4 h.p., T.T., 2-speed, F.E., tools, new tyres, B.B., Bosch mag., perfect condition; £38; week ends.—T. Warner, 69, East St., Epsom, Surrey. [5773]

BRADBURY, 1913, 4 h.p., 3-speed, clutch, Armstrong, Bosch, waterproof, B. and B., P. and H. lamp and generator, Watford speedometer, just overhauled and completely enamelled, very fast, perfect; seen any day; first cheque 45 gns. secures.—McGregor, 39, High St., Musselburgh. [X6078]

Brough.

DAN GUY, Weymouth.—1916 3½ h.p. Brough, 3-speed gear, overhauled by makers; guaranteed condition, £55. [5686]

3½ h.p. Brough, 1915, Semi T.T., and Montgomery 3½ coachbuilt sidcar, all excellent condition, Sturmer countershaft gear box, hand clutch, kick starter, Dunlops, speedometer, lamps, horn, stored since 1916, mileage 2,300; price £75; seen week-end.—Bramley, Hook Rd., Surbiton. [6027]

B.S.A.

B.S.A., 3-speed, 1919 models in stock.—Reys, 378, Euston Rd. [2972]

4½ h.p. B.S.A. Combination, chain-belt drive; £70.—J. C. Pickering, Shrewsbury. [6106]

B.S.A., 3½ h.p., 2 speeds, lamps, etc.; £32.—J. 115, Commercial Rd., Peckham, S.E. [6155]

NEW B.S.A.'s in stock: immediate delivery Model K.—Alexander, Agent, Wallasey Villages. [1506]

B.S.A.—Early delivery of 1919 models; brand new 1917 Model H, unscratched, in stock.—Moss, Wem. [X5920]

B.S.A., 3½ h.p., 2-speed, 1914, cane sidcar, excellent condition; 50 gns.—Phillips, Glenmore, Dawley, Salop. [X6056]

B.S.A., clutch model, complete with lamp set, 2 sets or handlebars, in splendid condition; £25.—151, Globe Rd., Mile End. [5929]

B.S.A., 1912, 2-speed, 3½ h.p., free, perfect condition, with sidcar; £35, or nearest offer.—Write, Kirklands, Tetbury, Glos. [6154]

1915 4½ h.p. B.S.A. Combination, all-chain drive, 3-speed countershaft.—Reynolds, 18, Crescent Rd., Tunbridge Wells. [5912]

B.S.A., 1913, very little used, 3½ h.p., 2-speed, Bosch, lamp, good tyres; best over £40.—2nd Lt. Edgele, 10, Percival Terrace, Brighton. [5951]

B.S.A. 3-speed Combination, coachbuilt sidcar, 1916 model, countershaft gear, kick starter; £90.—R. Shanks, Builder, Chatteris, Cambs. [X5790]

B.S.A., 1916, 4½ h.p., and Watsonian sidcar, all-chain, 3-speed, speedometer, accessories, kick start; £82.—143, Preston Drive, Brighton. [X5652]

B.S.A., 4½ h.p., 1915, 3-speed countershaft, chain-cum-belt, and coachbuilt sidcar, lamps and horn, tyres good; 60 gns.—After 6 o'clock, 27, Cranborne Rd., Barking. [6024]

MOTOR CYCLES FOR SALE.

B.S.A.

RIDER TROWARD and Co., 31, High St., Hampstead.—New 4½ h.p. B.S.A., chain-cum-belt, in stock, £79/16. Orders being booked for earliest delivery chain drive model, £81/18. [2559]

4½ h.p. 1916 B.S.A. Combination, complete with all accessories, £84/10; also an all-chain drive model solo machine, £65.—Wauchope's, 9, Shoe Lane, Fleet St., London, E.C. [5979]

B.S.A., 1917, 4½ h.p., 3 speeds, speedometer, set lamps unused, run 695 miles, been well taken care of, no defects whatsoever; £70.—L. Porter, The Abbey, Chertsey. [5937]

B.S.A.—For the earliest possible deliveries of 1919 models, specifications, and prices, sole district agents, The Walsall Garage, Wolverhampton, St. Walsall. Phone 444. [4669]

B.S.A., new 3-speed gear, clutch, recently overhauled by makers, frame just been rebuilt, engine in perfect condition, 1913, new variable jet carburettor; view Saturdays, after 4 p.m.—Walker, Park Lodge, Brentford, Middlesex. [X5942]

B.S.A., late 1916, 4½ h.p., with James sidcar, fitted with lamps and horn, Dunlops, B.S.A. 3-speed gear box; 2 smart outfit in new condition; £85.—Seen at Central Garage, Woolpack, High St., Romford. Closed 1 o'clock Thursday. [5953]

B.S.A. 3½ h.p. Combination, 2-speed, kick start, new Dunlop extra heavy, P. and H. lamps, horn, speedometer, extra cover and tube, spares, top hole condition; any trial here; seen any time; 60 gns. or close offer.—Ramsay, Chemist, Sunbury. [6044]

Calthorpe

CALTHORPE, 2h p., 1915, 2-speed, not used 2 years; £51.—56, Chommet Rd., Peckham, S.E. [5968]

RIDER TROWARD and Co., 31, High St., Hampstead—Immediate delivery new Calthorpe, all models. [3603]

CALTHORPE, 1914, 2-speed, £25—George Smith, Motor Cycle Depot, Clapham Junction. (Opposite Arding and Hobbs.) [5830]

CALTHORPE Minor, 5 detachable wheels, head and rear lamps, splendid condition; 195 gns.—245, Hammersmith Rd., W.6. [5732]

2½ h.p. Calthorpe, 2-speed, 1916 model, J.A.P. engine, all accessories; £45.—Wauchope's, 9, Shoe Lane, Fleet St., London, E.C. [5960]

2½ h.p. Calthorpe-Jap, 1914, T.T., Enfield 2-speed countershaft, good condition, less cylinder; bargain, £21.—White, Frimley, Surrey. [6132]

1914 Lightweight Calthorpe-Precision, 2-speed gear, good running order, newly overhauled, tyres as new; £16.—Hilder, Bexhill-on-Sea. [X5967]

1915 Calthorpe-J.A.P., 2½ h.p., 2 speeds, Enfield gear, not used since 1916, complete; £38.—55, Devonport Rd., Shepherd's Bush, W.12. [6177]

CALTHORPE-J.A.P., 1915, 2½ h.p., Enfield 2-speed gear, low mileage; £35.—George Smith, Motor Cycle Depot, Clapham Junction. (Opposite Arding and Hobbs.) [5831]

1916 Calthorpe, 2-stroke, Enfield 2-speed engine, completely overhauled by makers last month, splendid condition, with lamps; bargain, £35; buying combination.—Ineson, Plumber, Heckmondwike. [X5912]

Centaur.

2½ h.p. Centaur, little used, in splendid running order; £29.—3, Park St., Wellington, Salop. [X5970]

Chater-Lea.

CHATER-LEA, 8h.p. combination, 3-speed, countershaft, coachbuilt; £75.—Apply between 10-11 a.m. to M., 154, High St., Clapham, S.W. [5873]

Clyno.

CROW Bros., High St., Guildford, West Surrey agents for the 1919 Clyno. Order now to ensure early delivery. [1553]

6h.p. Clyno Combination, clutch, 2 speeds, all-chain drive, splendid condition; £50.—187, Lansdowne Rd., Tottenham, N.17. [6104]

CLYNO 1915 6h.p. Combination, 3 speeds, clutch, interchangeable wheels, lamps, speedometer, carefully used; £80.—95, Appach Rd., Brixton Hill. [6034]

CLYNO Combination, 6h.p. twin, 3-speed, disc interchangeable wheels, hood, screen, speedometer, lamps, horn 95 gns.—Seen after 2 o'clock, 25, Davisville Rd., Shepherd's Bush. [6101]

Connaught.

CONNAUGHT, 2-speed, good tyres, lamps, fast; £32.—3, Park St., Wellington, Salop. [X5972]

Corah.

3-3½ h.p. Corah, countershaft 2-speed, clutch, nice condition, ride away; £30.—113, Blair St., Poplar, London. [6023]

Dalm

1916 Dalm, 2-stroke, had little wear, almost new machine, splendid running order and condition; £33.—18, Archway Rd., Highgate, N.19. [6181]

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MOTOR CYCLES FOR SALE.

Dayton.

DAYTON Lightweight, low frame, pan saddle, all spares, splendid condition, tyres nearly new; £16/10.—Batten, Outfitter, Cullumpton. [X6036]

Dot

DOT-J.A.P. Combination, 8h.p., wind screen, lamps, in thorough condition; £80.—Kearsey, 94, Hoppers Rd., Wichester Hill, N.21. [5417]

Douglas.

DON'T Stand in the road looking for

ANY New Flat Twin Coming Along,

YOU Might Get Knocked Down by a Douglas.

GOURLAY, the great Douglas Agent, Fallowfield, Manchester. [X5991]

1911 Douglas, 2½ h.p., complete, less mag.; £12.—Wiles, Newchurch, Kent. [6020]

C. BERRY'S—2½ h.p. Douglas, 2 speeds, clutch, bargain, £30.—125, Canal Rd., Mile End. [6004]

2½ h.p. Douglas, T.T. model, complete, lamps, horn, 24 numbers; £37.—Cross, Jeweller, Rotherham. [X6061]

1912 Douglas, less mag., good running order otherwise; £14/10.—Cox, Station Hill, Eastleigh. [X5983]

DOUGLAS, 1915, 2½ h.p., 3-speed gear; any trial or examination; £55.—Parker's, Bradshawgate, Bolton. [6142]

DOUGLAS, perfect order and condition; £17/10.—Hall, Estate Agent, Tally-Ho Corner, Finchley, N.20. [5781]

DOUGLAS in Stock, 4h.p. combination, £105; War Office 2½ h.p. model, £60. new.—Moat, Yeovil. 'Phone: 50. [1103]

GIBB, The Douglas Expert, Gloucester, is the man to get in touch with for best deliveries and advice. 'Phone: 852. [4749]

DOUGLAS, 1913, 2-speed, T.T., just overhauled, topping condition; £34, bargain.—35, Mile End Rd., London, E.1. [5865]

1914 Douglas, 2-speed, Bosch, Binks, Klaxon hooter, lamps, just overhauled; £38; buying sidcar outfit.—Veale, Handforth, Cheshire. [6041]

DOUGLAS 4h.p. Combination, all accessories; recently cost £105, offer £87/10.—51, Maplethorpe Rd., Thornton Heath, S.E. [6031]

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DOUGLAS, 1913, 2½ h.p., 2-speed, in splendid condition, re-enamelled, new back tyre, lamp set, and all accessories, like new; £40.—42, Barclay Rd., Leytonstone. [5847]

DOUGLAS, late 1914, 2½ h.p., excellent condition, last used 1915, tyres as new, complete set tools, lamps; 37 gns.—Write D., Scripps Advt. Offices, South Molton St., W. [5845]

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1915 (October) 2½ h.p. 3-speed Douglas, semi-T.T. bars, only ridden 2,000 miles on short leaves during war, complete dynamo electric lighting with switchboard, head, tail, and inspection lamps, electric horn, accumulator, all in good working condition, tyres done under 300 miles, pair partly worn covers if required, Douglas tool kit and spare belt, all in perfect condition, ready to ride away; price £50 cash, no offers; seen by appointment.—Write, C.H.H., Court Hill, Banstead, Surrey. Phone: Bank 8114 during day or Borough Heath 166 after 7 or on Saturdays or Sundays. [6088]

Enfield.

6 h.p. Enfield Combination, complete lamps, etc.; £75.—Pickering, Mardol, Shrewsbury. [6107]

ENFIELD, all models, early deliveries.—J.A. Stacey, Sole Agent, 12, Ecclesall Rd., Sheffield. [X154]

ENFIELD 1916 6 h.p. Combination—Lamb's, 151, High St., and 50, High Rd., Wood Green, N. [5889]

ENFIELD Combination—Book your order now for earliest deliveries.—Parker's, Bradshawgate, Bolton. [6140]

6 h.p. Enfield, coach sidecar, wind screen, speedometer; 65 gns.; reliable.—2, King Edward Gardens, Barnsley. [5965]

ENFIELD 3 h.p. Twin, 2 speeds, £25; also Canoelet sidecar, suit 3½ h.p. or 6 h.p., £10.—93, Northwood Rd., Clifton. [5976]

ENFIELD 2½ h.p., 2-speed, good condition; can be seen and tried by appointment; £32.—Perrins, Architect, Redditch. [X5993]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries Enfields, all models. [2261]

ENFIELD 2½ h.p. twin, 2-speed, grey model, very little used, new tyres; £30.—Wilson, 16, Aberdeen Terrace, Northampton. [X6071]

1916 Enfield Combination, mileage 1,500, Lucas accessories, original tyres; 90 gns.—17, Tamworth Park, Commonsides East, Mitcham. [6059]

ENFIELD 6 h.p. Combination, J.A.P. engine, very good order, ready to use; £65.—Roberts, Music Stores, King St., Melton Mowbray. [X6085]

ENFIELD 3 h.p. Twin, Model 140, 2 speeds, etc., slightly soiled; 50 gns.—The Exeter Motor Cycle and Light Car Co., Ltd. Bath Rd., Exeter. [0958]

ENFIELD 6 h.p. Combination, perfect running order, splendid condition, lamps, speedometer; 69 gns.—Pratt, Decorator, Tottenham Lane, Hornsey. [6037]

JONES' Garage—We are accepting orders for all models of Enfields; one delivery promised this month; deposits optional.—Broadway, Manswell Hill. [0993]

ENFIELD 6 h.p. Combination, coach sidecar; £70; exchanges—George Smith, Motor Cycle Depot, Clapham Junction. (Opposite Arding and Hobbs.) [5828]

LATE 1915 6 h.p. Enfield Combination, with Lucas dynamo lighting, electric horn and inspection light, good condition; £98, no offers.—Thomas, Midland Bank, Netherth. [X5917]

ENFIELD Combination, 6 h.p., late 1916, Lucas dynamo lighting set, speedometer, horn, hood and screen, in perfect order; £125.—Boddy, Hernshead and Esber Av., Walton-on-Thames. [5877]

NEW Enfield Combination, 8 h.p., purchased December 1918, only driven from works, spotless, fitted speedometer, Klaxon horn, adjustable wind screen, hood lamps; £155.—Simpson, 6, Wilbury Crescent, Hove. [X5874]

ENFIELD 2½ h.p., 2-stroke, purchased August, 1917 brand new, in first-class condition, a really genuine offer of a most efficient machine; price £40, lowest; no dealers.—C.V.T., 28, Cavendish Sq., London, W.1. [X5864]



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ROYAL Enfield Combination, 1917, mileage well under 1,000, condition and appearance as new, lamp, horn, and tools; 100 gns.; recent countershaft geared single part.—Hawes, 129, Wantage Rd., Reading. [6018]

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Excelsior.

EXCELSIOR Auto-cycle, 10 h.p., Victory model, nearly new, all latest improvements; £65, a bargain.—Particulars, Hall Keeper, Town Hall, Hendon, Middlesex. [X5974]

1916 7-9 h.p. American Excelsior, electrically equipped, wants slight attention and battery, underslung coachbuilt sidecar; £69/10.—Halifax Motor Exchange, 18a, Union St. South, Halifax. [5888]

AMERICAN Excelsior, 1916, 7-9 h.p., kick start, electric light and horn, hand-foot clutch, 3-speed gear, with Gloria sidecar, tyres good, splendid mechanical condition; officer must sell owing to demobilisation; £85.—Box L9,900, c/o The Motor Cycle. [5825]

Fafnir.

3½ h.p. Fafnir, Bosch, B. and B., 2 speeds, and clutch, 32 spring forks, low, running order; £20.—19, Wood Lane, Shepherd's Bush, W.12. [6127]

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5-6 h.p. F.N., 2-speed, clutch, all in good condition; £28/10.—455, York Rd., Wandsworth. [5971]

F.N., 2½ h.p., Bosch mag., new belt, just overhauled, in perfect running order; first £15 secures.—Douglas, 66, Queen's Rd., Brighton. [5738]

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1916 Harley, best Harley sidecar, dynamo model, offers, or exchange.—29, St. Leonard's St., Bromley-by-Bow. [6157]

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HARLEY-DAVIDSON, 1919 models, actually in stock; also 1916 7-9 h.p. electric model and sidecar, in exceptional condition.—Lamb's, 151, High St., and 50, High Rd., Wood Green, N. [5890]

Henderson.

HENDERSON Combination, splendid condition, speedometer, lamps, etc.; £65.—29, Brigstock Rd., Thornton Heath. [6048]

RIDER TROWARD and Co., 31, High St., Hampstead.—Orders now being booked for earliest deliveries new Hendersons. [2264]

Hobart.

1917 Hobart, 2½ h.p., 2-stroke, in new condition; 28 gns.—16, Spencer St., Hinkley. [X6124]

HOBART-VILLIERS, 2½ h.p., 2-stroke, 2-speed, Amac, C.A.V. mag.; £27/10; ride away.—Avondale, Southampton St., Farnborough, Hants. [X5876]

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HUMBER, brand new 1917 3½ h.p. flat twin model in stock.—Moss, Wem. [X5921]

3½ h.p. Humber, 3-speed, free engine, and sidecar; £45.—Pickering, Mardol, Shrewsbury. [6108]

1913 3-speed Twin Humber, good condition, with cash, for Douglas, or sell £20.—27, Ann St., Plumstead, S.E. [X5933]

HUMBER 2½ h.p., 1914, in good condition, requires tuning up; £16, or nearest.—Wilson, Dover Cottage, Royston, Herts. [5883]

HUMBER, 1914, 3½ h.p., 3-speed, clutch, kick-start; £35, or exchange lightweight.—28, Suonybank, Oakworth, Keighley. [X5990]

MOTOR Cycle, Humber 2 h.p., lightweight, perfect running order; £15; seen by appointment.—Manning, 27, Milton Rd., Wallington. [5824]

1913 Humber, 3½ h.p., 2-speed, and P.E., in splendid condition, good tyres, new Dunlop belt, 26 gns., first cheque.—Wiles, New-hatch, Kent. [6019]

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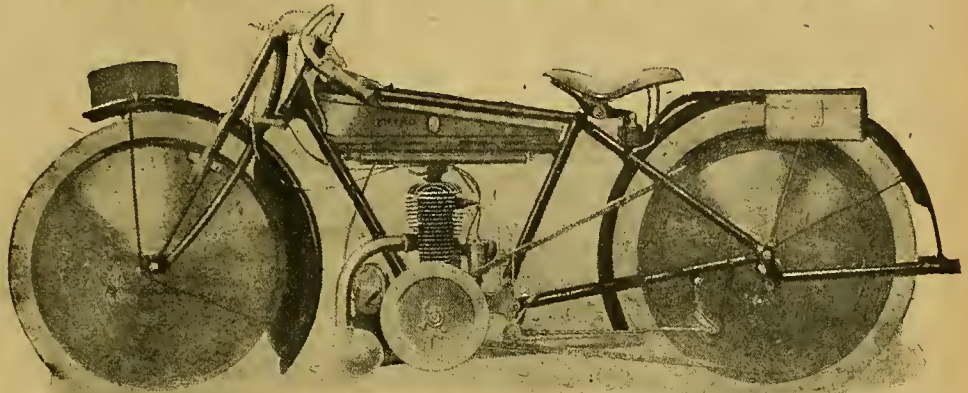
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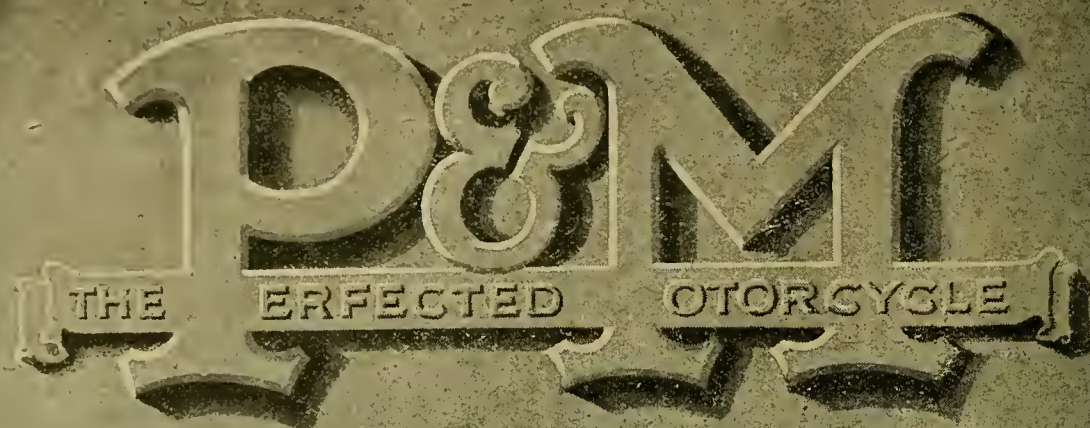
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Roads and Road Transport.

READERS who studied their daily papers with care on Wednesday last week may have been tempted to imagine that the much advertised opposition of road users to the Ways and Communications Bill had, to use a popular expression, "fizzled out" during the second reading on the previous two days. Any such conclusion, however, would have been distinctly inaccurate, for, though the Parliamentary Road Transport Committee did not press the matter to a division, their chairman, Mr. W. Joynson-Hicks, made it quite clear, not only that motorists were anything but satisfied with the Bill in its present form, but that a storm of opposition to it had been aroused throughout the country among the local authorities whose duty it is to make, repair, and maintain the roads.

The mere fact that a division was not challenged on the second reading must not be taken as an indication that the representatives of automobilism in Parliament will not have a good deal to say when the committee stage of the Bill is taken. As a matter of fact, we know that the clauses affecting roads and road transport will be strenuously contested by the Parliamentary Road Transport Committee, and we have no doubt whatever but that certain amendments will be agreed to which will safeguard the roads and will render it less easy for an autocratic Minister to subordinate them to the railways.

Under the Ways and Communications Bill, as it stands at present, it is proposed that Brigadier-General Maybury, now manager and secretary of the Road Board, of late responsible for the construction and upkeep of the roads in France used by the British armies, and before the war the Kent County road surveyor, shall be placed in charge of a special Roads Department of the new Ministry. That is excellent so far as it goes, but it does not go far enough.

In the first place, it would be within the power of the Minister summarily to dismiss General Maybury, and to substitute for him a far less

competent man; in the second place, General Maybury would be in a subordinate position, where it would not be part of his duty to determine questions of *policy* when the interests of the railways and of the roads happened to clash. Such determination of policy would be the prerogative of the Minister, and in the case of Sir Eric Geddes, the Minister designate, there is reason to fear that the advantage of the railways would be served at the expense of the roads.

We believe it will be strongly argued during the committee stage of the Bill that the Road Board should be revived, either as a separate Department with a Minister at its head, or as a Department under the general supervision of the Ministry of Ways and Communications. From the point of view of all motor vehicle users the former would be the more acceptable alternative, but, judging by the attitude of the House last week, we do not think that roads and road transport are likely to be entirely divorced from the new Ministry. It is more probable that the Road Board will be attached to the Ministry, though even this is problematical.

Government Motor Cycle Sales.

THE amazing idea has been put forward in the evening daily provincial press that the high prices fetched by Government motor cycles indicate that the motor cycle manufacturers are endeavouring to corner the market by buying up everything that may be converted into a serviceable machine. This they designate as a "profiteering ramp in the motor cycle trade," though why profiteers should buy goods at high prices they entirely fail to explain. The high prices are eminently satisfactory from the country's point of view (though not from the buyers'), but they appear to us to be due rather to the eagerness of riders to possess at once some sort of motor cycle than to any action on the part of motor cycle manufacturers, who, in the matter of these sales, stand in a position of absolute equality to the general public.



Silencing the Exhaust.



A Rider's Experiments with Various Forms of Silence.

NOW that we have reason to expect a greater degree of silence in valve gear and transmissions, the problem of eliminating the sound of the exhaust is due for attention on the part of motor cycle manufacturers. While the mechanical noises on most machines were more irritating than the note of the exhaust, there was little to be gained by reducing the latter, because it only made the former more apparent; but in these days of all-round mechanical improvement manufacturers should make an effort to render their machines silent in all ways.

The need for reform is evident to those who do a thousand miles holiday on a sidecar outfit. In some cases there is difficulty in carrying on conversation, and the noise made by the engine is perhaps more apparent when compared with the intensity of silence when the machine is stopped.

Silencers vary according to the tastes of the makers. The latter may or may not possess an exhaustive knowledge of the laws governing the question of silencing. For instance, one finds a bigger expansion chamber

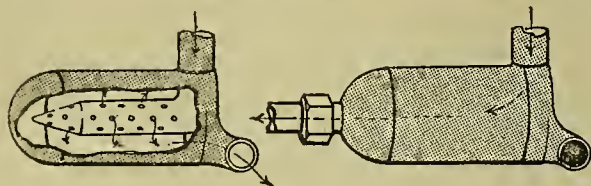


Fig. 1.

on some lightweights than on some 4-5 h.p. machines. Again, some have empty chambers, while others embody baffles of various descriptions. A few makers utilise aluminium alloy for heat conducting purposes; others use sheet steel cylinders with timbrellic propensities. In most cases the primary exhaust pipe has the same diameter as the tail pipe.

The position of these pipes is an important matter. For example, in some makes the entrance and exit of the gases are on the opposite ends of the barrel; in others the pipe enters tangentially on the circular side

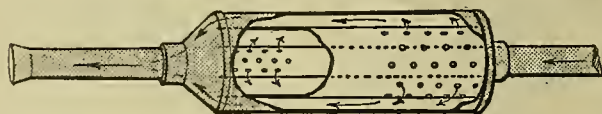


Fig. 2.

of the silencer, the gases leaving at some other point of the circumference. The idea is to produce a spiral course for the gases within the silencer. In cases where the primary exhaust pipe enters the barrel adjacent to the opening of the tail pipe, it seems evident that the gases entering the barrel must obstruct the passage of the gases leaving the silencer, and thus create back pressure.

The writer once possessed a machine having this defect, and it may interest readers of *The Motor Cycle*

to follow the evolution of an improved silencer which is now fitted to his machine. The original silencer is illustrated in fig. 1, which also shows in the right-hand sketch the alterations marking the first step in the experiments.

Fig. 2 shows a copper pipe passing directly from cylinder to a copper silencer built up of three expansion spaces. This was a tremendous improvement on



the original so far as efficiency was concerned, but the noise was much the same.

Fig. 3 depicts another idea which was tried in conjunction with the original silencer. The back pressure was fairly low, but the cone produced megaphonic results giving an exhaust of high resonance. The big end was open to the atmosphere, the idea being to impel a current of air through it by the motion of the machine and so add cold air to the hot gases. It was proved, however, that the exhaust gases found an exit from the big end as well as from the fish tail. Investigation showed that with the large end open there was more back pressure than when it was closed by a cap, the difference in speed being about two miles per hour.



Fig. 3.

This silencer had another drawback, *i.e.*, the difficulty of attachment. The intermediate chamber was therefore omitted, likewise the cone, and an internal chamber added in its place. This arrangement, which is shown in fig. 4, was satisfactory from the standpoints of efficiency and reduction of noise,

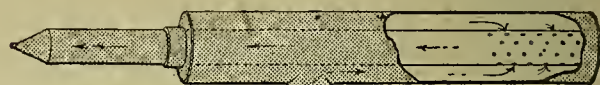


Fig. 4

although perhaps it may appear massive and un-

One wonders if the principle is capable of application to silencers. The salient feature of silencing is quickly to reduce and consequently the install resistances to the gases to a minimum. The whole subject is an interesting one, as a fact that some engines show higher efficiency with certain silencers than when exhausting directly into the atmosphere.

may appear slightly.

The venturi principle of application to factors in silencing exhaust gases are the temperature, volume, and to the passage of the gases. It is a proved principle that gases show higher velocity when passing through a narrow passage. D. SHARP.

FROM THE MURMAN COAST.

A PELMANIST'S EXPERIENCES.

Wherever the British Army goes, the "Little Grey Books" follow. They are to-day almost an integral part of the outfit of a British officer or soldier.

Even from the bleak Murman Coast, where a British force is gallantly holding back the Bolshevik hordes, come letters full of gratitude for what Pelmanism has done for its students.

Here is one such letter, recently received :

"Your letters so far have been very valuable to me. Thanks to your teaching, the ——— of the North Russia Expeditionary Force selected me to be his typist; later, through my interest in some rather difficult problems—which became comparatively easy when the Exercises, especially Exercise X., were applied to them—he made me his confidential clerk.

"I realise how much I have lost through not enrolling in the Pelman Institute immediately upon my arrival in England in the summer of 1917.

"Your exercises have also been of intellectual benefit to me; through their aid new interests are opening out. What at first appeared to be a very barren outlook in Russia now has every sign of being very profitable, for my knowledge of Russia, its people, its industries, its resources and possibilities, is on the upward plane—I am learning how to see, and, having seen, to understand."

This letter emphasises in a peculiar and striking fashion "the interest-power" aroused by Pelmanism; and "Interest," as everybody knows, is a big item of the secret of success. The man who is interested displays keenness—and keenness to reach a definite goal has never yet failed to result in progress.

Let every non-Pelmanist reflect upon this letter: let him consider what it means. Here is a man taken from civilised life, from his home, his regular occupation, his usual environment, and set down, a soldier, upon one of the most inhospitable and apparently uninteresting parts of the European Continent.

His first sensation is one of hopelessness: his uncongenial surroundings discourage him. Left to himself he would become the victim of circumstances, as so many have done.

He takes up Pelmanism. He has heard much of it and, without attaching much importance to it, decides that he might as well study that, having nothing else to do in his leisure.

Within a few weeks he begins to be conscious of a new stimulus; his outlook brightens, his individuality begins once more to assert itself. He learns the grand truth which so many have now learned—that "circumstances" cannot extinguish the man who refuses to be extinguished.

His activities—inspired by the "Little Grey Books"—revive; his faculties respond to the wholesome and invigorating Pelman exercises—as they always do. Success follows almost immediately: a small success, but it is quickly followed by further success. New interests appear; he begins to find there is more—much more—in his environment than he was conscious of before. To use his own words, "I am learning how to see, and, having seen, to understand."

How many unsuccessful men and women realise that they themselves are largely to blame for "not having seen." There are some who live all their lives confronted daily by possibilities and opportunities which they never see; clerks who might become managers if they saw what was in front of them; salesmen who might become organisers and directors if they would view their human and other surroundings with seeing eyes.

If Pelmanism did no more than compel its students to a wider and deeper vision, it would justify all that has been said in its praise. But it does far more.

Having awakened you to a realisation of opportunity—having shown you that for each and all of us the world is still full of measureless possibilities, it then develops in you a sense of your own potential powers, stimulates you to a resolve to develop and use those powers, gives direction and strength to your efforts, shows you how to train and apply your faculties, and finally leads you to that form of success which is your heart's desire.

There is no magic in it. It is so simple and as understandable as the development of muscular strength and dexterity by regular physical exercise. An athlete can train any particular muscle or group of muscles by means of definite physical exercises; so the Pelmanist trains a faculty—any faculty, or all of his faculties—by practising the simple and interesting mental exercises set in the "Little Grey Books."

The result is never in doubt. There has never yet been a single case in which the Pelman exercises, regularly followed, have failed to produce benefits. It may be that only twenty or thirty minutes a day can be devoted to them; that does not matter. If the exercises are conscientiously followed, you will find the benefit coming from the first—benefit that you yourself can note and appreciate.

The mere fact that well over 400,000 men and women of all vocations have now adopted Pelmanism says a great deal for the system—proves that it is no new experiment, but a thing of tried and proved practical worth. Amongst those 400,000 you will find many who have been placed exactly as you are now placed—who have felt just your fears and hopes—have experienced just your disappointments—and who have finally taken up Pelmanism to find—sometimes in the very first of the "Little Grey Books"—just that information and guidance which has changed their careers from failure to success. Can you afford to neglect Pelmanism?

QUESTIONS OFTEN ASKED.

Readers are requested to note very carefully the Questions and Answers given below. It will save them and the PELMAN Institute a certain amount of correspondence about details.

1—How many lessons are there in the PELMAN Course?

Twelve. The Synopsis of these lessons will be found in the pages of "Mind and Memory."

2—How much time should be given to the Course daily?

This depends on personal circumstances, as some pupils have more spare time than others. Twenty minutes or half an hour daily should enable the pupil to complete in three or four months.

3—Will this Course help me in my business?

There is no brain worker in any business or profession who cannot benefit by the study of the Course.

4—What do you mean by the word "System"?

This word is used in order to express a certain quality in the training; that quality is *Method*: in other words, the organisation of knowledge and its scientific application to everyday needs.

5—Is the result of the training lasting?

Undoubtedly; the training ensures permanent benefit. The man who is put on the right road for physical health must continue to respect physical laws, otherwise his health declines once more. It is the same in the mental world. The PELMAN System shows a man how to use his mind in the best way, but if he becomes careless he naturally loses what he has gained, and his mental efficiency relapses into his previous inefficiency.

6—Is the instruction individual?

Yes. The system is individualised to each pupil by means of annotations; by personal letters; and by answering the personal questions of the pupil himself.

7—I have not had a good education. Is this a drawback?

If you have had an ordinary school education you will find nothing in the PELMAN System which you cannot understand and nothing which may not be a source of profit.

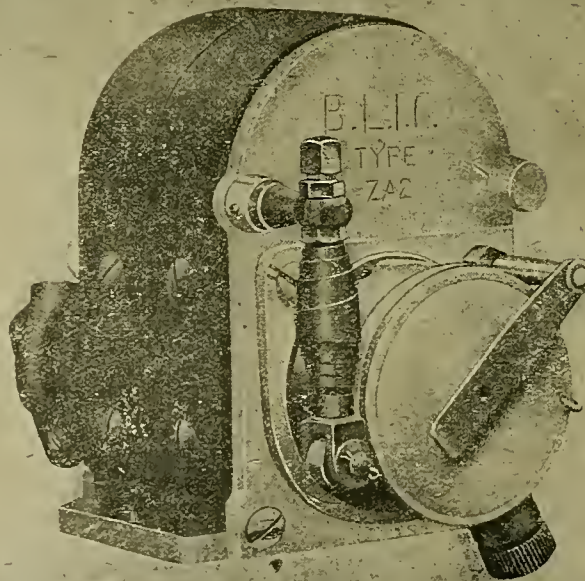
Full particulars of the Pelman Course are given in "Mind and Memory," which also contains a complete descriptive Synopsis of the twelve lessons. A copy of this interesting booklet, together with a full reprint of "Truth's" famous Report on the work of the Pelman Institute, and particulars showing how you can secure the complete Course at a reduced fee, may be obtained gratis and post free by any reader of THE MOTOR CYCLE who applies to The Pelman Institute, 199, Pelman House, Bloomsbury Street, London, W.C.1.

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OCCASIONAL
COMMENTSBY
"IXION"

Engine Bearings.

WE all know that the first parts of the average motor cycle engine to develop serious wear are the connecting rod bearings. I hail two tendencies which are distinctly evident in what a haberdasher would call the new season's goods. The first is the system of making the gudgeon pin fast in the small end of the rod and giving it bearings in the piston bosses, which are naturally of larger area than the conventional type. The second is the increased application of roller bearings to the big ends. Patents probably hinder an even wider application of this system. The roller bearings stand up much longer than phosphor bronze, but they can claim another advantage, which the average rider may not yet have realised. *They require far less oil.* Give the motor cycle engine four things which figure on some of the newer 'buses, namely:

1. Gudgeon pin bearings which need less oil.
2. Big end bushes which need less oil.
3. Cylinders which do not distort.
4. Pistons which do not push a bank of oil in front of them, and set up unnecessary frictional heating.

Then we can cut down the rate of lubrication. The periods between decarbonisations will lengthen out and tune will be longer maintained.

Canadian Needs.

A CANADIAN who has served in the R.F.C.-R.A.F. for the past two and a half years, sends me a very frank letter from Ontario upon his demobilisation. Whilst in the Service he rode many miles on a P. and M., and says he grew to like "the dependable little creatures." He has no good word to say for British machines, apart from their sturdiness and reliability; "3½ h.p. is far too small, and I hate single-cylinders like poison." He frames an indictment from the Canadian standpoint, which includes the following counts:

1. Crazy handle-bars.
2. Bowden wire control.
3. Too many levers on handle-bars.
4. Two-lever carburetter.
5. Small wheels and tyres.
6. Hand-operated lubrication.
7. Side-by-side valves.
8. Insufficient springing.
9. Extremely high prices.
10. Front brakes.
11. Enclosed chains.

I don't know what "crazy handle-bars" mean. I prefer Bowden wires to jointed rods. There are usually six levers on the handle-bar—carburetter (two), ignition, brake, valve-lifter, clutch. I agree in so far that I prefer a single-lever carburetter, ignition lever on tank or magneto, no handle-bar brake control, *i.e.*, three h.b. levers instead of six. I do not desire to

use another two-lever carburetter. Tyres and wheels are large enough for pre-war English roads, but 26×2¼ in. is probably too small for overseas work and for post-war British roads. Hand-controlled oiling ought to have been washed out years ago. What's the matter with side-by-side valves? They are a good deal more reliable than the finicky little o.h.v. gadgets beloved of most Yankee designers. Springing—well, the unsprung frame will not be a good seller in 1920; my correspondent must grasp the fact that we used to have good roads in this country, and were too unimaginative to build motor cycles for countries not so blest. Prices? Small outputs with an assured market do not make for price cutting. Front brakes? Please bomb Parliament; we don't want them, but we have to fit them; still, there's no reason why manufacturers should not fit two foot-controlled rear wheel brakes. Enclosed chains. Our public prefer them. A small percentage of our riders always pull the cases off as soon as they take delivery; if that type of rider predominates in Canada or other overseas markets, the trade ought to cater for him on their export models, but naked chains don't sell over here.

Circumstances Alter Cases.

ANALYSIS of the above criticisms suggests that the motor cycle is produced by its environment. Twist-grip control is more or less enforced by rough roads. If you adopt twist-grip control, you are limited to a semi-automatic or a one-lever carburetter. Big tyres may roll on a good road, but you put up with their roll on bad roads because they ease the jars. On rough roads you cannot spare a hand to fool with an oil-drip adjustment: indeed, on a surface like Applecross it is not easy to dab a pump handle down. If the local bumps are intolerable, frames must be sprung, whatever the additions may weigh or cost. If you belong to a new country with no foreign trade, you will develop a go-ahead spirit, and when your 1919 output is sold, you will ask, "Let us see, can I find a new market and double the output in 1920?" In which case your price will probably be cut rather fine, as several of your neighbours will be busy on similar lines. Finally, front brakes are quite safe (if rather futile) on decent going, and chain cases are a real advantage where there is no danger of their getting kinked or buckled by complicated tumbles: but no sane man wants either if he is going to blaze a trail from the Cape to Cairo.

The long and short of it is that the British bicycle grew up on British roads, which it suits jolly well: and the Yankee bicycle grew up under much rougher conditions, for which it was specially designed, and which it unquestionably fits. Unfortunately for us, the average British maker thought until yesterday that the best bicycle for Brixton was also the best bicycle for Buluwayo, and, anyhow, he did not much care

Occasional Comments.—

about Buluwayo so long as Brixton would sop up his output. Meantime the American bicycle suited the Overseas buyer, and the American maker was out for world markets, just as the N.S.U. people were ten years ago. By the irony of fate, just when the British maker has developed the imagination to visualise foreign markets and the ambition to covet them, war debts, reconstruction difficulties, and labour problems threaten to queer his pitch. Nevertheless, in twelve months' time I fancy my Canadian friend may find quite a few British twins to suit him.

Wider Frames Wanted?

PEOPLE are remarking that certain 1919 machines are too wide in the frame. Thus custom doth make fools of us all. The widest 1919 frame is narrower than the handle-bar span when all is said and done, and the machine can still thread the same old gaps in traffic. I wonder what the British working man would say if our electric trams were modelled on Irish jaunting cars, the passengers sitting back to back down the centre, with their feet and legs stuck out in the slipstream on footrests and footboards? Yet this asinine practice has been standard on 90% of our motor bicycles for twenty years. At last a few makers, led by A. A. Scott, have tumbled to our real needs, and widened the lower part of the frame to form a well in which our nether limbs are more or less protected from mud and dust and wind and rain. The merit of this is beyond controversy—it ought to have been done years ago. The only controversial point is concerned with the results of a crash. Sooner or later every machine comes a purler. Should the impact be taken by components vital to the structure

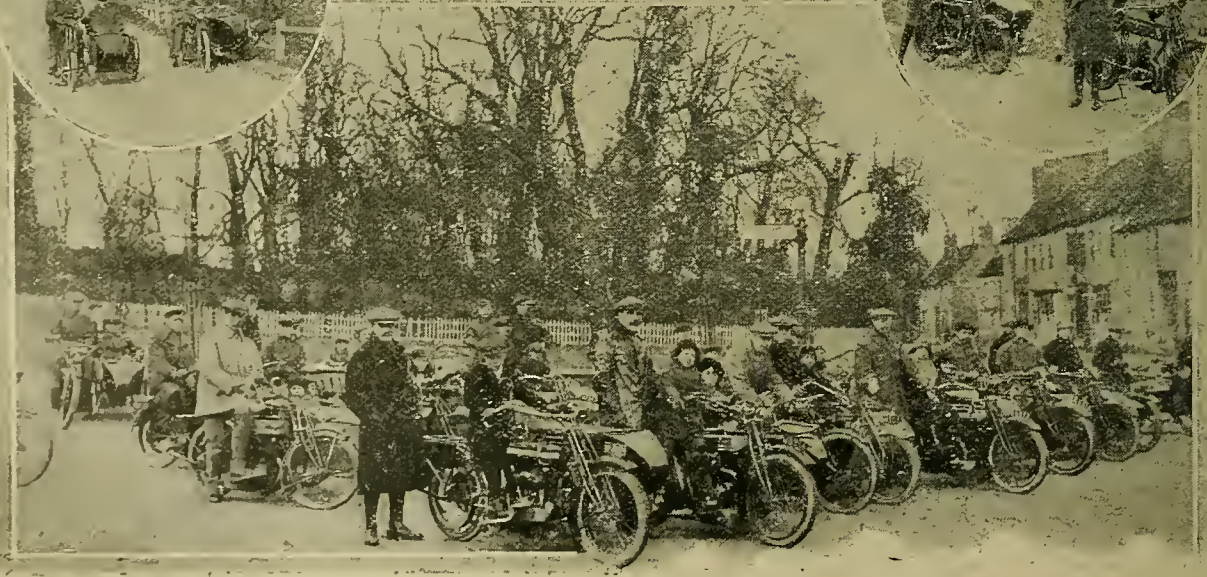
or by stuck-on gadgets of a bendable or cheaply replaceable character? This is something of a problem, and there are two schools of thought. A. A. Scott works on the lines of the anti-torpedo "blister" fitted to our super-Dreadnoughts: if his machine slides twenty yards on its shoulder, the main structure is immune, and the crash is taken by self-sacrificing parts which transform themselves into fenders for the occasion. On the new A.B.C. the frame itself stands the racket. Financially there is little in it. A new frame costs no more than a fresh set of mudshields, footboards, etc. On the other hand, it is easier to fit a few replacement gadgets than to strip a machine and re-erect its components on a new frame.

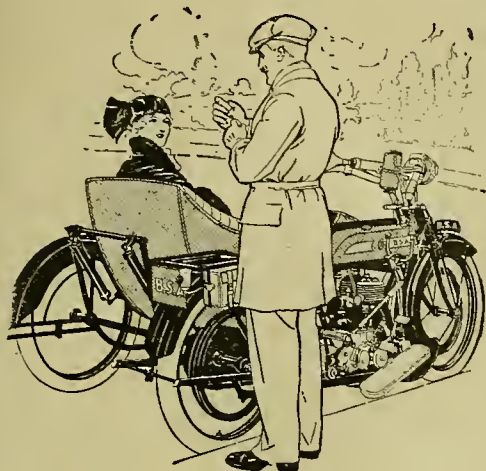
Friction Drive.

ONE of my technical friends gave me a rude shock last week. He is a cycle car enthusiast, and was hoping to give the ubiquitous sidecar a nasty knock with his new friction drive buggy. Like everybody else, he imagined that friction drive must be cheap because it is made of paper or cork instead of steel, and has got no teeth on it. Then he sent his buyers out to make tentative enquiries and got down to the facts. All the firms who compress sodden scrap blotting paper, or whatever the secret *compo* is, into shapely rings sent him sample disc faces and eke quotations for quantities. His own shops provided figures for steel rims, webs, hubs, and shifting gear. He scratched his head and stared at the figures till his eyes swam. There is not a fiver between friction drive and a pukka four-speed gear box for an 8 h.p. cycle car. In fact, supposing your shops are moderately equipped, there is not twopence between them. Quite a "have," was it not?

Sheffield section of the M.C.F.U. The run last week to the pretty village of Blyth proved a popular fixture. Nearly fifty machines were lined up on the village green during the course of the morning, sidecar outfits predominating.

Inset (left): On the road near Blyth Bridge. Inset (right): A lady member with her two-stroke Crescent. Her neat riding garb is worthy of note.





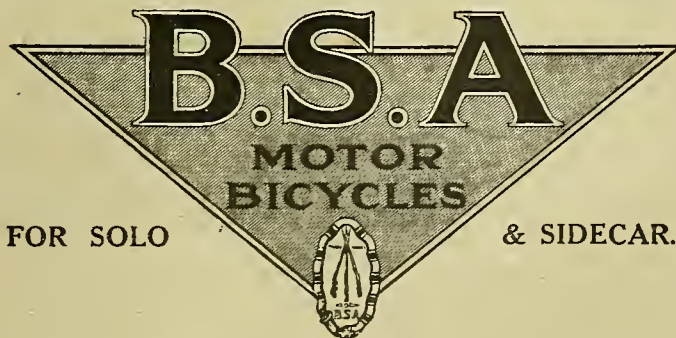
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"Motor Cycling's"
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"The **COMFORT** of the machine was really extraordinary, and our representative would not, previous to the trial, have believed it possible for him to have negotiated the road at such a speed without being thrown off

"The sense of **SECURITY** in going round corners was really extraordinary.

"The machine is capable of extraordinary **HIGH SPEEDS**.

"The performance for an engine of this size, and on a machine which is essentially suited for comfortable **TOURING**, is indeed a good one, and we cannot too much impress the fact that this speed and acceleration are not made at the sacrifice of the interests of the potterer.

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THE MOTOR SCOOTER.

PROPELLED PLATFORMS OR MINIATURE MOTOR CYCLES?

DAILY press scribes threaten us with an invasion of American motor scooters. Some would have us believe that they will eventually supplant the lightweight motor cycle as a utility machine: but we do not think that, while reliable and proved light-weights abound, the British public will follow the lead of Sir Henry Norman and Admiral Hall to the extent the lay press seems to think.

There is no doubt that the above-mentioned personages have been instrumental in focussing interest on the Auto-ped, to quote its proper name, the Motor Scooter being an appellation given to it by *The Motor Cycle*, when it first made its appearance in this country.

There may or may not be room in the field of motoring for machines of this type; of course, they are only fit for "pottering" about, but, like all novelties, they attract. Their success as a commercial proposition is another matter, and will depend upon their price, their mechanical efficiency, and their suitability for present day roads.

Why Stand?

The drawback of the "Scooter" in its present form is the fact that the rider is called upon to stand on its platform, and the majority may find it extremely fatiguing even for short distances. A question which naturally arises is "Why stand?" and, although we have asked this question many times, no satisfactory answer has been forthcoming.



Incidentally, the daily press once again shows itself ready to give credit to a foreigner when the credit is due at home. The scooter is a British idea—and an old one at that. The Max led in 1907, and appeared at the Stanley Show of that year. It was built for its inventor by Messrs. Douglas Brothers, of Bristol, and the engine was a 2½ h.p. J.A.P. It reappeared at the 1908 show, and one model had a folding saddle.

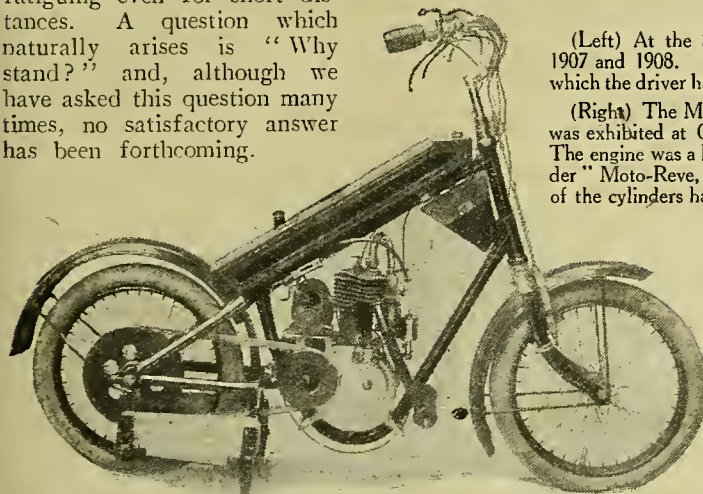
The Max was not the only machine of its type to be staged at the shows; the Moto-Frip, designed by a Mrs. Kent, was exhibited at the 1911 Olympia. This was a miniature tricycle fitted with a 1½ h.p. Moto-Rêve engine, one cylinder of the little twin having been removed.

The Auto-ped (motor scooter) used by sun bathers on the sands at Long Beach, U.S.A., in 1916.

In 1912 we published a cartoon in which the artist suggested a scooter "T.T.," and in 1916 we illustrated a motor scooter patented by Mr. J. Maina, of Brixton, which closely resembled the Auto-ped.

In the meantime America has also produced other designs and machines, one of which, the Mon-auto, provided a seat, but, as will be seen from the illustration on the next page, the riding position was somewhat cramped. In addition, American papers just to hand show the latest specification of a machine on similar lines, but designed to utilise an auto-wheel and a bucket seat.

If some enterprising maker will make a scooter, fit a saddle somewhat on the lines of the machine referred to last week as a super-scooter, and make a first-rate featherweight motor cycle of it, he will do well.



(Left) At the Stanley Shows of 1907 and 1908. The Max, upon which the driver had to stand.

(Right) The Moto-Frip, which was exhibited at Olympia in 1911. The engine was a little "two-cylinder" Moto-Reve, from which one of the cylinders had been removed.



The Motor Scooter.—

In the two-stroke engine he has the simplest form of power unit. There is much greater promise of success in this than in the scooter, pure and simple.

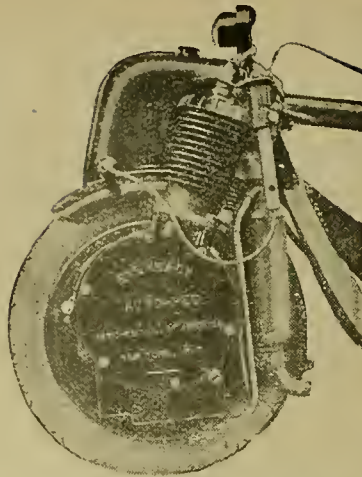
It is amusing that the "motor scooter" is now hailed as a new invention. Old readers of this journal know differently, as it was illustrated in *The Motor Cycle* over a dozen years ago. It is said that the Auto-ped has achieved great success in America, but confirmation of this point is lacking, and for the past two years the U.S. journals have scarcely referred to it. However, the success of an article in America is no reason why Great Britain should take it up.

The *Daily Mirror* prophesies that "Brighton, Southend, Clacton-on-Sea, and other holiday resorts will have to be enlarged to accommodate London's population of seven odd millions who will scoot there on Friday nights. And on Monday mornings these millions of breathless people will scoot back to work, invading London from the North, South, East, and West—vast dust-covered hordes of holiday makers."

Undoubtedly a great deal of piffle has been written concerning the scooter, and probably if the same energy and enthusiasm

were devoted to the lightweight motor cycle it would serve the public better. It would be interesting to read the reports of these writers after they have attempted a long journey standing on a scooter. It is not in this kind of motor-ing, however, that the scooter may score, but as a utility runabout machine for short distances between home and the office, or shopping centre.

If there is anything in the scooter idea, we have every confidence that the British motor cycle



The engine of the Auto-ped scooter. It was this type that Sir Henry Norman used recently in the streets of London.

industry will get its full share of the trade in it. Already several makers are keenly interested, and at least one British machine has been undergoing road tests for some time.

According to the designer, who, incidentally, is a staid thinking man, the little machine is capable of quite satisfactory speeds on country roads and will climb ordinary hills. Notwithstanding, we cannot think that the British public will be content for long to stand up, when by developing the scooter one stage further it can be made a comfortable and serviceable featherweight motor cycle, capable of moderate touring.

Naturally we welcome any addition to the scope of the motor-driven bicycle, and we are watching developments closely, but again we are constrained to ask "Why stand?"

As the Auto-ped is so constructed that it is very difficult from the exterior to understand "why the wheels go round," very few are acquainted with the inner mysteries of the mechanism.

As will be seen from the illustration on this page, the power unit is attached on the left side of the front wheel, whence the drive is conveyed through a dry plate clutch from a small pinion on the crankshaft to an internally-toothed drum secured to the front wheel itself.

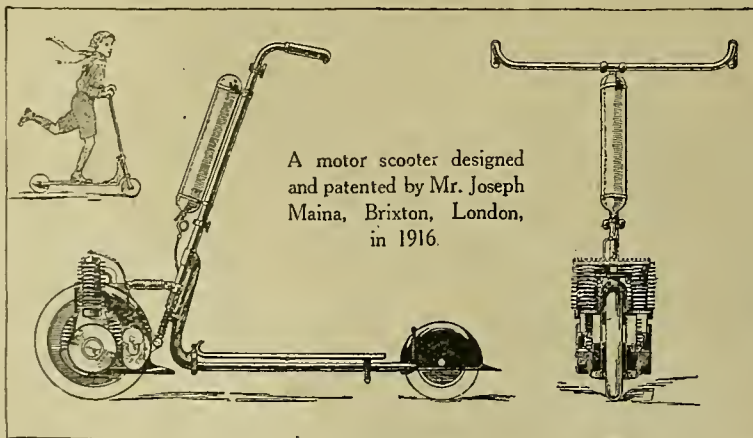
The flywheel is located on the right side of the wheel, and embodies a flywheel type magneto.

The Gibson Mon - auto, an American 50 lb. £20 proposition.



The single-cylinder has a bore and stroke of 56 and 63 mm. respectively. Petrol reaches the automatic carburettor by gravity from a tank carried above the front wheel mudguard.

Tyres 15in. x 2 1/4in. are fitted. The internal expanding brake is operated, as is the disengagement of the clutch, by pulling the steering pillar backward and downward.



A motor scooter designed and patented by Mr. Joseph Maina, Brixton, London, in 1916.

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during the war claimed the whole output of our works and enforced on us the renunciation of our extensive relations with the French and Italian Governments. The performance of

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under strenuous active service conditions proved to our authorities that the TRIUMPH could be relied on to get there despite the wrecked roads, bad weather, and many handicaps of war-worn country.

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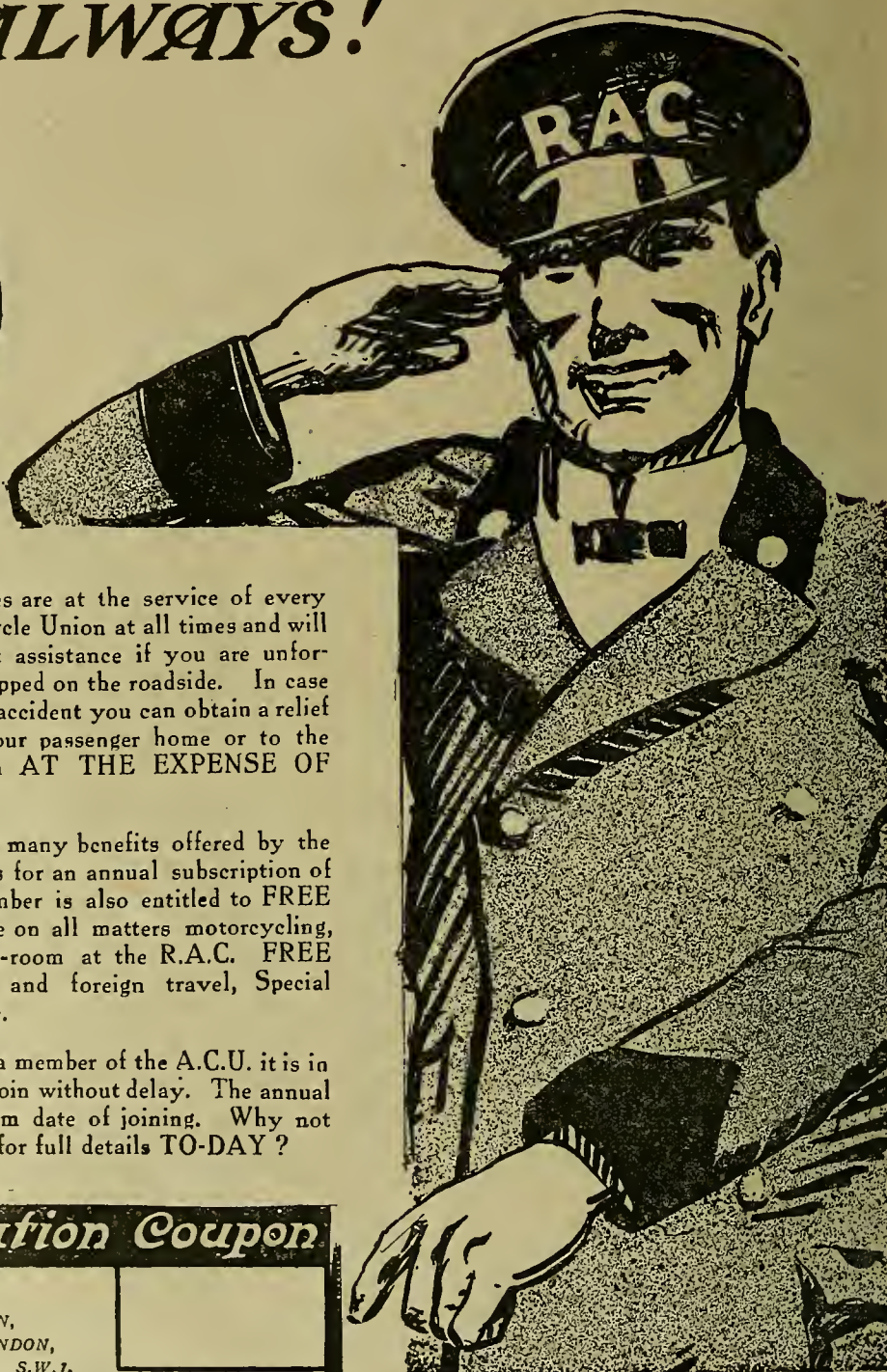
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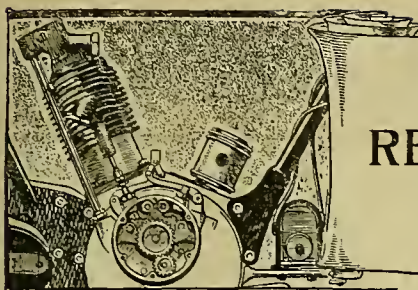
The Secretary,
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PALL MALL, LONDON,
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Please send me further particulars regarding the advantages of becoming a member of the A.C.U., together with Application Form for membership.

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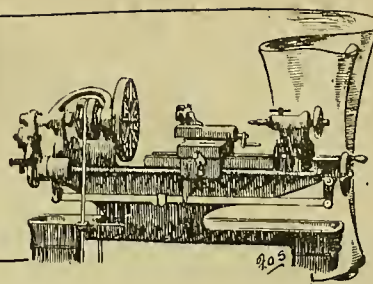
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"The Motor Cycle," 27/3/19.



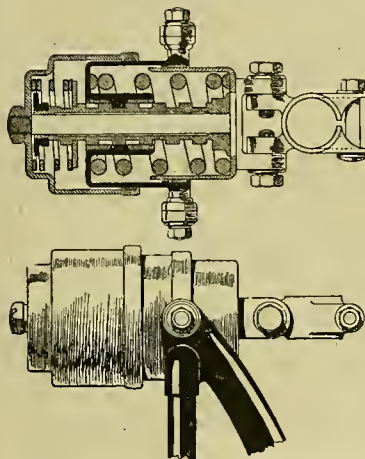
RECENT PATENTS.

REVIEWED BY B. H. DAVIES.



A FEW years ago there was a regular craze for a hobby known as "bent ironwork." Enthusiastic amateurs purchased bundles of strips of soft iron, a pair of shears, and a pair of flat-nosed pliers. They then proceeded to turn out candle-holders and easels, for photographs, which they presented to meek relations or dumped on unsuspecting bazaar committees. A crop of homicides followed, because, although such ornaments were beautiful when suitably gilded, it was quite impossible to keep their twined interstices clean, and irate housewives were consequently led to break up many happy homes. The motor cycle will ultimately perish for similar reasons, unless something is done to round off its innumerable spiky projections. Up to date, Mr. R. W. Coan has ploughed a lonely furrow, in advertising "Clean Crank Cases." Now Mr. Norton comes to his aid with a patent for cowlings in the top half of the engine. Fundamentally, of course, Mr. Norton's suggestion is of technical value. The rear wall of an air-cooled motor cycle cylinder lies in a patch of dead air. As the sketch shows, Mr. Norton proposes to fit a belt-driven fan at one side of the engine cowlings, and the rear wall

material. Now that most of our roads are bad, the Triumph people evidently feel that the action of their spring fork needs damping; and Mr. Stanley has

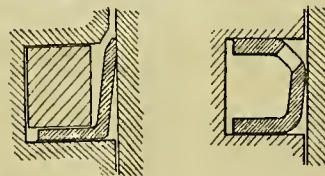


G. E. Stanley's shock absorber for spring forks. Patent No. 121,763. 2/11/17.

evolved a most ingenious device, which will unquestionably improve the fork over all kinds of road surface. Various applications of the idea are conceivable. In the form shown, the front end of the spring beds into a steel cap secured to the cross spindle at the head of the forks. When the front wheel passes over a bump, this cap is jerked backwards, and compresses the spring. Now we come to the braking action. At the centre of the spring cap is a coarse-threaded nut, riding on a coarse-threaded sleeve: the sleeve floats on the fore and aft spindle passing through the centre of the spring coils. When the spring cap moves towards the back of the machine over a hump, the nut at the centre of the cap must rotate the sleeve. The rear end of the sleeve bears hard against a bearing on the steering tube, and so the sleeve resists rotation by dint of end thrust. The spring can neither shut up nor rebound quickly, and "clashing" is obviated. If desired, a second spring can be fitted to damp the rebound still further. The whole mechanism can be packed with lubricant and encased. I shall be interested to see how the thread of the nut and the central part of the sleeve wear, but admit that several alternative applications of the principle are possible; and we all know that Triumphs never market a gadget which they have not tried out.

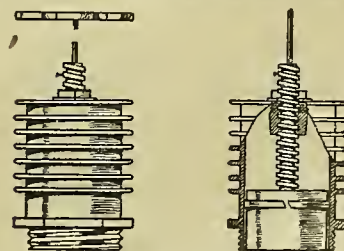
Mr. A. V. Watson is interested in the "obturator" type of piston ring. Before

the designers of air-cooled engines had learnt how to prevent distortion, they adopted flexible piston rings, so that the ring might automatically take up the varying clearance between piston and cylinder. The sketch shows the commonest type of obturator, consisting of a thin L shaped brass ring, located in an ordinary groove by an ordinary type of ring known as the "packing" ring. This pattern of obturator gave much trouble on aero engines, as its vertical flap met heavy weather on the upward stroke of the piston. One example of Mr. Watson's ring is illustrated. There is no "loose flap" to chafe on the up stroke of the piston, and the holes in the bevelled top corner of the channelled ring permit the explosion pressure to "inflate" the ring on the firing stroke, and so ensure a gastight fit for the piston. Of course the friction generated by such a ring flies right in the face of Mr. Ricardo's theories, and I doubt if obturators have any future on explosion engines: but the patent may prove useful on the pistons of certain types of pump. Distance pieces may be mounted between the channelled flanges to prevent collapse of the ring when the side wall wears out

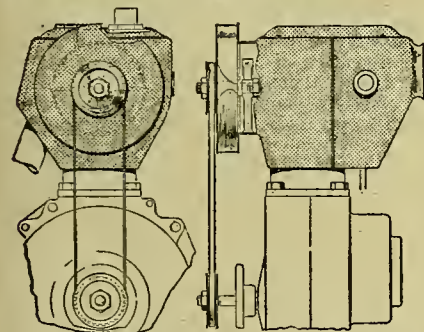


A. V. Watson's obturator ring (on right) shown in comparison with a conventional Gnome type of obturator. Patent No. 122,054. 28/1/18.

Mr. N. Smith has patented a gadget for varying the compression ratio. In pre-war days expert riders often adjusted the ratio by utilising valve caps which projected into the valve chamber to different depths, or were machined hollow to different capacities; and the dodge was quite useful when the same engine



N. Smith's variable compression device. Patent No. 121,876. 18/3/18.



J. L. Norton's engine cooling device. Patent No. 122,072. 5/3/18.

of such a cylinder will be as well cooled as the front. He should presently offer us a cylinder cooled so evenly that distortion is imperceptible; needless to say, no motor cyclist has ever owned an engine of which this could be said. Riders will equally appreciate the ease of cleaning which such a design confers.

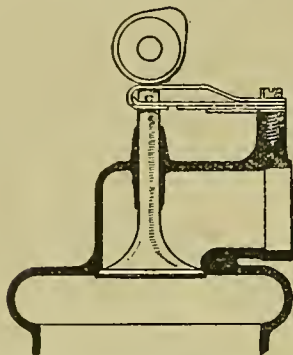
Mr. G. E. Stanley is taking the famous Triumph fork in hand. The current Triumph fork utilises a single coiled spring, which is compressed very rapidly over a really bad bump and rebounds with proportionate violence. In the old days, frightful pot-holes were the exception, and this "clashing" occurred so seldom on British roads as to be im-

A Batch of Patents.—

was used for such extremes as solo sprint hill-climbs and sidecar touring. The Smith patent is certainly preferable to such crude makeshifts, as it permits the rider to vary the ratio from the saddle by a large percentage. There should be no fear of leakage, as the piston ring is not subject to appreciable heat.

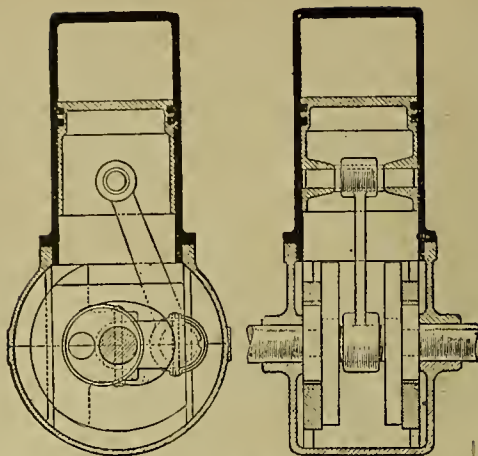
Laminated Valve Spring.

In the early days of motor cycling my chief hoodoo was the valve gear. It was a common occurrence for the timing pinions to strip their teeth, and one rider lost a fine chance of an End-to-end record because his valve tappets ate through the case-hardening of the cams and ploughed them down into circular discs. Rocking levers were presently interposed between the cam and the tappet to distribute the wear and furnish better leverage. I hope the patent under consideration may be understood to herald an overhead valve Norton engine in due course. However that may be, Mr. Norton proposes to use a laminated valve spring to act as a cam lever for an overhead valve as shown.



J. L. Norton's mechanically-operated overhead valve. Patent No. 122,379. 24/8/18.

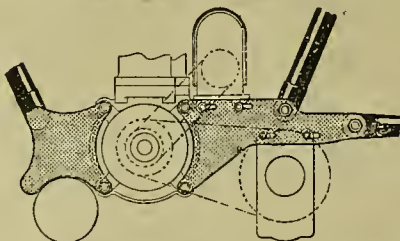
The Swedish patent is perhaps too technical to interest the average reader. Briefly, before an engine can be made vibrationless, two sets of parts require to be balanced, viz., the rotating parts, e.g., the crank pin, which buzz round in a circle, and the reciprocating parts, e.g., the piston, which bob violently up and down. There is nothing new in balancing the crank pin, etc., by such a counterweight as is shown in the drawings. Mr. Morén, however, endeavours to balance the up and down parts by means of further counterweights, which slide in guides fixed inside the crank case; they are



Moren's balanced crank-pin. Patent No. 122,345. 30/5/18.

moved up and down to balance the piston by means of cams fixed to the crankshaft, and operating against cam-paths machined on the counterweights. The value of this patent rests upon compromise. Is the probable improvement in balance preferable to the frictional losses of heaving the counterweights up and down in their guides?

Mr. Radnall has patented the cradle method of mounting the engine, gear box, and magneto shown below. It has obvious advantages for assembling machines in the shops or for the private owner in home repairs. By

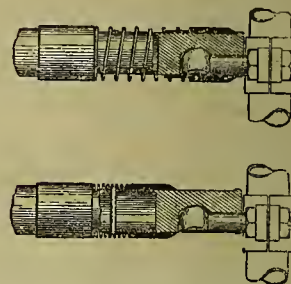


E. A. Radnall's cradle method of mounting the engine. Patent No. 122,276. 30/1/18.

knocking out four bolts the unit, consisting of engine, magneto, and gears, is dropped out of the frame, whilst either the magneto or front engine chains can be adjusted by slacking two bolts, and that without any fear of losing alignment. It is surprising that so simple a cradle has not been protected before.

Messrs. Alldays and Onions patent an attachment for sidecar connections, which

is self-explanatory. Four knuckle-headed pins are mounted at the usual points of the bicycle frame in any approved fashion. At the corresponding points of the sidecar frame are four tubular lugs recessed to house the knuckle-headed pins. Each lug is fitted with a spring-loaded cap, which locks the knuckle-headed pins into the recesses in the lugs. No tools are needed to detach the sidecar. The rider merely pushes back the spring-loaded caps, locks them back by means of a bayonet joint, and gives the chassis a wriggle, when the pins free themselves from the lugs. As often as not the sidecar should drop clear when the fourth cap is pushed back. Attachment is almost equally simple, as it is only necessary to lock back all the spring caps, register the pins with the lugs, and release the spring caps. The joint appears to be as safe as it is unquestionably simple.



Alldays and Onions sidecar coupling. Patent No. 122,286. 8/2/18.

The last patent in my week's bundle soars so far towards the ideal that it deserts the practical sphere, so far at least as motor cycles are concerned. It is the invention of Mr. Alfred Lewis, and when I say that it amounts to an infinitely variable gear, which automatically changes its own ratios in response to varying loads, every reader's mouth will begin to water. But if I add that this eminently desirable effect is obtained by means of an epicyclic train, which controls a second epicyclic train by means of a friction drive, and I further go on to say, with the Queen of Sheba, that the half has not yet been told you, and that the editor cannot spare me space for the diagrams needed to explain all the cams, springs, etc., concerned, well, the order of the day becomes, "Carry on with a common or garden Sturmey-Archer!"

MOTOR CYCLE DESIGNING IN THE FUTURE.

MR. L. B. HENDERSON, A.M.I.A.E., recently delivered a lecture on motor cycle design before the Sheffield District N.M.C.F.U., when he pointed out the need for more scientific design in the future, as in the past the motor cycle had not received the same careful consideration as the motor car. He referred to many engines being badly balanced, the chief offenders being single-cylinder and small V twins, necessitating unduly heavy frames to withstand the

stresses imposed upon them. The extravagance of present lubrication methods was also dealt with, the lecturer demonstrating how at practically no extra cost oil could be delivered exactly where required and diverted from those places where its presence was harmful. Mr. Henderson also criticised clutches, the alleged defects of mudguards, belts, brazed joints, springing, steering heads, etc. An interesting discussion followed, in which the importance of introducing

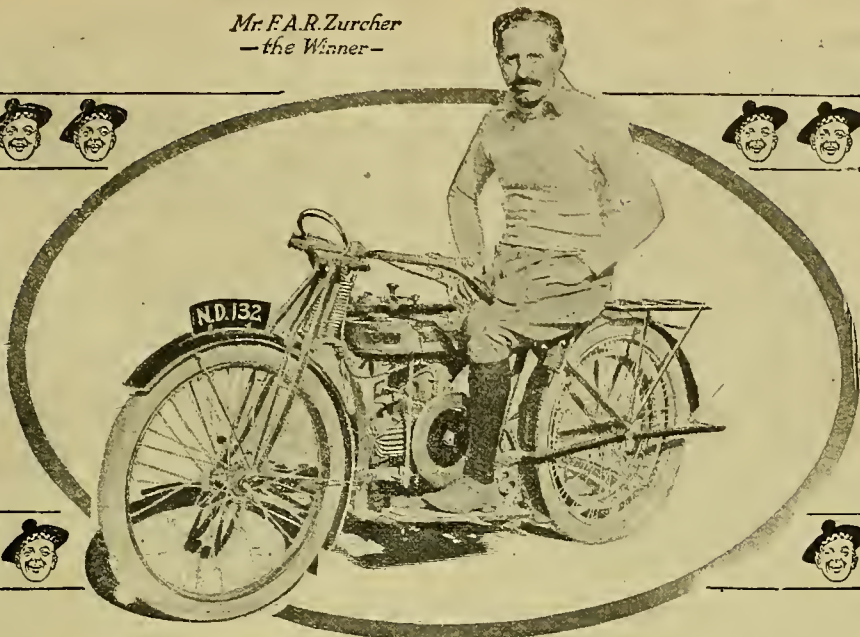
rustless and stainless steel into the manufacture of motor cycle components was mentioned.

The opinion was expressed that if motor cycle manufacturers do not pay more attention to scientific design and cleanliness, the motor cycle would be displaced by a small car, scientifically designed, with all mechanism fully enclosed, a minimum of unsprung weight, and costing no more to produce than a sidecar outfit of the same power.

Mr. F. A. R. Zurcher
—the Winner—



20,000
Miles on the
Road and
THEN —



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Douglas

BEATS ALL OTHER MAKES.

The biggest motor cycle event in Natal—The RUDGE Trophy Hill Climb, open to all makes of machines—has been won by F. A. R. Zurcher on his DOUGLAS. All the best known makes of machines were beaten by the little DOUGLAS—a 1914 model which had previously done over 20,000 miles on the road—which also captured the 350 c.c. Speed Trial.

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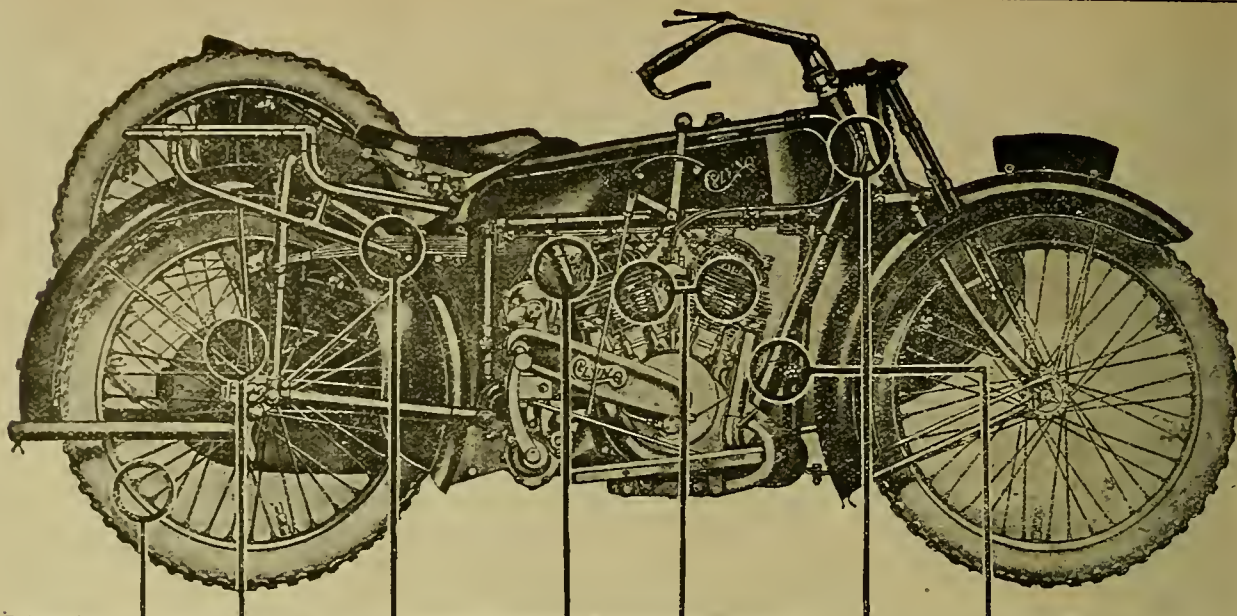
39, Newman Street, London, W.1.

**RUDGE TROPHY HILL CLIMB
RESULTS (SOLO)**

Name and Machine.	Best Time.		Figure of Merit.
	m.	s.	
1. F. A. R. Zurcher (2½ Douglas)	3	27	4874
2. R. Sizor (3½ Rudge)	3	6	4957
3. R. Goodwin (2½ A.J.S.)	3	38	5129
4. A. R. Morcom (4 Norton)	3	4	5158
5. P. Lawrence (7-9 Indian)	2	44	5162
6. A. M. Stewart (3½ Rudge)	3	20	5814
7. R. Blackburn (3½ Rudge)	3	18	5946
8. H. B. Morcom (3½ A.B.C.)	3	39	5949
9. T. H. Spargo (7-9 Harley-D.)	2	49	6031
10. L. R. Acutt (2½ Douglas)	3	42	6220
11. R. S. Campbell (3½ Scott)	3	23	6375
12. J. C. Button (7-9 Harley-D.)	2	52	6380
13. T. Kenyon (3½ Rudge)	3	21	6471
14. Marie E. (4 Triumph)	3	27	6561
15. S. W. Simpson (4½ B.S.A.)	3	41	6767
16. B. H. Borain (4½ Bradbury)	4	4	7220
17. A. G. Ford (7-9 Harley-D.)	3	38	7474
18. O. M. Peckham (3½ Triumph)	3	58	7829
19. B. Wilson (7-9 Harley-D.)	3	17	8151
20. J. Goldie (2½ Douglas)	4	21	8251
21. C. Middleboro (2½ Douglas)	4	16	8439
22. W. A. Mills (3½ Sun)	4	58	8917
23. G. A. Armitage (3½ Triumph)	4	34	10263
24. A. B. Graham (3½ Triumph)	7	10	



In answering this advertisement it is desirable to mention "The Motor Cycle."



Taking The Clyno Point by Point

Quickly detachable and interchangeable 28" x 3" wheels, with VOITURETTE rims, are fitted. These have old steel hubs and large adjustable ball bearings.

This is the only bent tube in the principal frame structure. It supports the engine on one side and the gear bracket on the other.

The front down tube is 1 1/4" in diameter, and strengthened internally by high tensile steel tie bars. It is calculated to withstand any stress put upon it by the sidecar.

The 1" x 1/4" chains are entirely enclosed in strong metal cases, reinforced and built up on castings. This method of construction has proved to be highly successful on the Sidecar Machine Gun Outfit supplied by us to the Government. It makes for simplicity and easy removal.

The whole frame is of unusually substantial structure. Note the exceptionally strong head, which, whilst being massive, does not in any way detract from the pleasing appearance of the whole design.

Short springs with seven leaves are hinged at their rear ends on the side of a loop member which is pivoted at the end of the chain stays. This system is calculated to avoid any lateral play.

Note the angle of the cylinders. They are set at 42°, which, it is believed, is unique in British practice, the usual angle being 50°.

Of course it is not possible here to enter into a detailed description of the twin-cylinder, long-stroke engine, but expert motor engineers consider it is bristling with good points — exclusive features which will make for quite exceptional performance on the road. The Post-War Clyno, as

we have previously stated, is practically identical with that yet to be constructed combination, that has been specified and voted by experienced riders everywhere as representing the ideal machine.

CLYNO

THE Sidecar Motor Cycle.

The Clyno Engineering Co.,
Pelham Street, Wolverhampton.

Get your name upon our waiting list to-day.

Some Speed Sensations



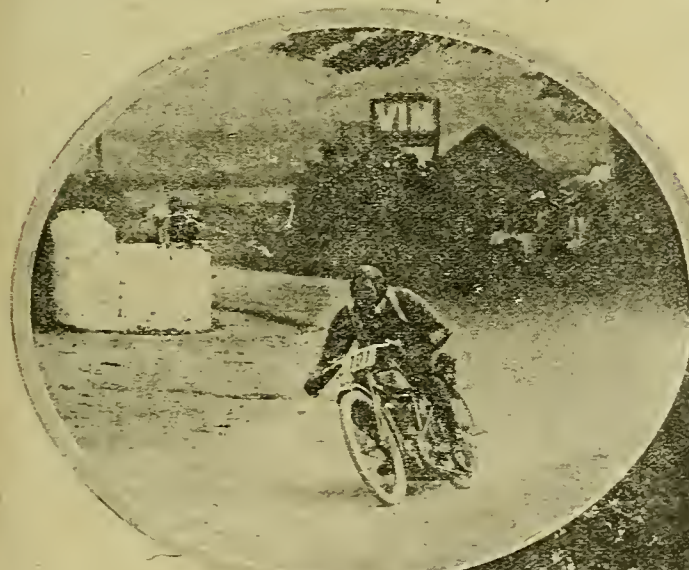
The Three Factors in Producing "Thrills."

Some Psychological Considerations—Excitement at 6 m.p.h.—Boredom at 120 m.p.h.

MY brain box started bubbling as I read some criticisms by "Revs" on my colleague "Ixion's" notions of the sort of "hogbus" which ex-pilots would want after the war. "Ixion" thinks that a $3\frac{1}{2}$ h.p. machine is too slow for a man who has flown at over 100 m.p.h. His critic compares flying to sitting on a stationary platform and watching a map being slowly unrolled beneath. I enter the discussion without alarm, for I am going to pat them both on the back.

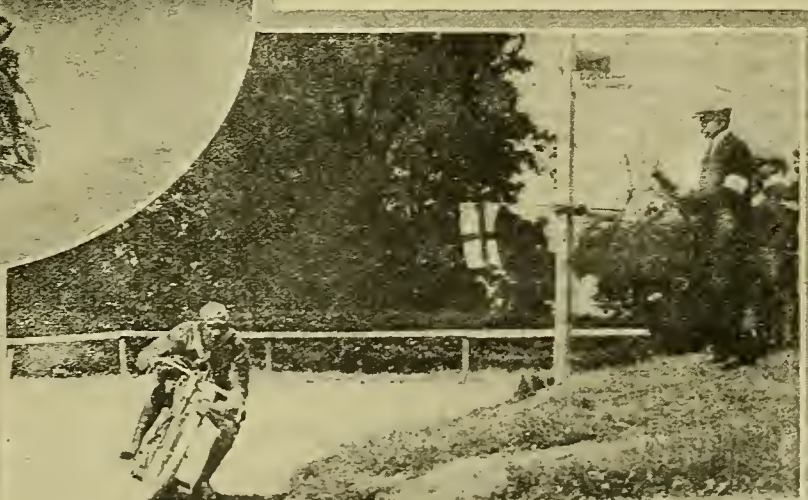
The psychology of speed is very puzzling until you have thought it out. When Mr. Locke King began to construct Brooklands with a banking calculated to hold cars swirling at 120 m.p.h., the "unco guid" held up pious hands in horror. A jaded earth was seeking a new sensation. The Roman amphitheatre, one

gathered, was a mothers' meeting compared to what a bloodthirsty gate would seek at Brooklands—ton-weight projectiles, belching oil fumes and thunder, careering round till the sole survivor of each race lifted the cup. We went to Brooklands, avid but shamefaced. What did we reap in the way of sensation? A bored Epsom bookie was heard to remark in disgust, "Look at them 'ere blinky beetles crawling round that unmentionable saucer." And he was right. The giant oval dwarfed cars and speeds alike. To get a real thrill at Brooklands, one had either to be in a car, or sticking one's nose through the palings, as a car doing not less than 100 m.p.h. hugged the inside edge fairly closely. Incidentally, this is just why Brooklands has never drawn really big crowds and never will: you get far more thrills to the square millimetre in watching a taxi take Piccadilly Circus at 25 m.p.h. The same applies to the Isle of Man. In the last T.T. car race I watched Lee-Guinness and others travelling up to at least 80 m.p.h. along roads which were mostly second grade lanes. Whether I got a breathless impression of speed depended very largely on where I stationed myself. If the standpoint gave a view of several square miles of country, the fastest car reminded one of the laborious progress of a rather lame cockroach. If you hid near a double corner, saw the car lurch suddenly into sight,



IMPRESSIONS OF SPEED IN THE TOURIST TROPHY RACE (I.O.M.)

Probably more thrills are experienced on the T.T. course than on Brooklands, both by the riders and spectators.



Some Speed Sensations.—

skid round, and vanish, your marrows quivered. If you sat in the front room of a house by the road, and got the swift blur and split second concussion as the car crossed the open window, you knew it was moving. Otherwise you generally got bored, and under-estimated the speeds by 50%.

So is it with flying also. Ask a steady pilot whose main job has been short distance reconnaissance at altitude near the lines, or ferry work, how he likes flying, and he will tell you in nine cases out of ten that he finds it supremely boring. Put him on a baby two-stroke in the City, and his manhood will respond to the danger and alertness which the job implies. "Revs" has probably flown under some such circumstances as I describe above. But ask a stunt merchant or a ground-straffer whether flying conveys any speed sensations, and his answer will be quite different. At 10,000 feet, or, indeed, well below that altitude, flying is very like sitting in a railway carriage and surveying a distant landscape through a telescope, except that you cannot smoke. But you get the speed thrill in stunting: low down, or in any sort of low altitude flying.

To sum up these peculiarities, there are really three quite distinct factors in the speed sensations which a motor cycle can convey. The first is association. If you are travelling faster than usual, the speed thrill gets you. So you are sure of it on the first few jaunts as a novice, for though you may only do 20 m.p.h., you never did as much as a push bicycle. If you are a staid old potterer, and your eldest boy whacks you to 30 m.p.h. when you give him his first motor, you get the speed thrill all over again. When you have habituated yourself in competition work or on lonely roads to know what a mile a minute feels like, this element vanishes out of your life: and, like first love, it never returns till you take to some faster projectile still, e.g., an aeroplane.

The Open Road and Traffic Riding.

The second is relativity—pardon a mouthful of a word. I mean speed in relation to surroundings. On the far-flung and almost vacant road across the Grampians, you can reel off mile after mile in less than 1m. 50s. without the faintest suggestion that you are going fast. But cross London in a hurry from, say, Bromley to Stanmore, and, though you may never exceed 25 m.p.h., you will develop just the same physiological symptoms as a T.T. winner, and your sensations will be very similar, although, instead of trying to cut down Tim Wood on a Scott, you are chasing a fat old tramcar in your anxiety to pass it before passengers flood the roadway at its next pull-up

post. For this reason you can get somewhat absurd speed thrills when a wheelbarrow runs away with you down a garden path, and miss them altogether when flying at 120 m.p.h. two miles up. I have risked my worthless neck an incredible number of times in all sorts of suicide 'buses on land, on sea, and in the air; but I never, never get the wind up so badly as when I am taking an S bend in a pony trap at 8 m.p.h.

The Influence of Danger.

The third factor, which overlaps the previous two to some extent, is danger. Once get the notion into your noddle that danger is afoot, and the basic elements of the speed thrill are there all right. I imagine that an intelligent child of, say, two and a half years, being wheeled a shade too fast in a pram by a flapper sister, occasionally feels just what a hedge-hopping pilot feels when he dives at the ground and begins his zoom a shade too late for comfort. Does not the sensation of having a large throbbing melon in your mouth arise when you tackle a greasy turn into your own front gate at 6 m.p.h. instead of 4 m.p.h.? Or when you set your speed rather finely to take a dry corner and the pot-holes in the road bounce your front wheel off the psychological line you had planned in your mind's eye?

There are other subsidiary factors. Noise is one of them. Open the throttle wide on a low gear, and, for preference, up one of those deceptive climbs where the surrounding country does not rise imperceptibly with the road. You note the engine bellow and whisper proudly to yourself, "She's doing a good 45." Then you look at the speedometer, and, though it is a generous liar, it cannot make your speed better than 32.

To sit in a low sidecar of a fast machine or in a speedy cycle car which occasionally rubs its stomach on the ground, will also produce speed thrills; especially if your driver, at 50, leans lovingly towards you to obtain ignition for his cigarette from your own. To be near the ground at 40 is as thrilling as 60 on a car, while 30 on a motor scooter no doubt will cause sensations equal to participating in a wild west show.

Nevertheless, broadly speaking, your hope of speed thrills depends upon travelling faster than usual, seeing near objects vanish fast (like the telegraph posts which a Yankee mistook for a high 'paling), and on a spice of danger. You get none of these in routine flight at altitude: you get them all in motor cycling under certain conditions. But the veteran motor cyclist cannot get them with a lightweight on the open road.



SIDECARRING IN BURMA.

In the most distant and out-of-the-way parts of the globe the sidecar is fast growing in popularity, and the B.S.A. outfit shown has proved its worth, both from business and pleasure points of view, on the frontier of the northern Shan states and other districts of Upper Burma.

**T. T. WINNER,
1914.**

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It is now ready and
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Cycle Makers to
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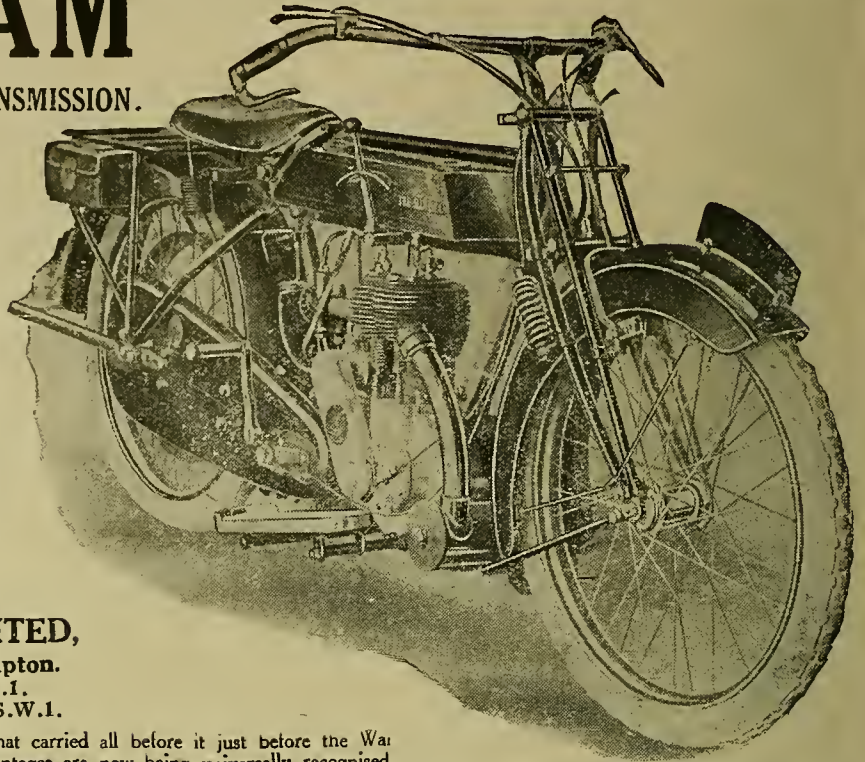
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SUNBEAM MOTOR CYCLES

WITH PERFECT POWER TRANSMISSION.

*The Best Motor Cycle before
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AS the time is coming near when Sunbeam Motor Cycles can again be supplied to the general public, it will be a *Source of Satisfaction for You* to remember that your name is on their Waiting List. Application should be made at once to



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N.B.—The Sunbeam is the Motor Bicycle that carried all before it just before the War began. Its extraordinary reliability and advantages are now being universally recognised

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2 ³/₄ h.p.

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6 h.p. 8 h.p.

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Whatever your requirements, there is a
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Their ever-increasing popularity is testimony of
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THE MOTOR CYCLISTS' PARLIAMENT.

Annual General Meeting of the Auto-Cycle Union at Birmingham. Need for Stronger Provincial Element Confirmed.

THE provinces will be more strongly represented on the committee of the A.C.U. than has hitherto been the case, five of the twelve "individual" members elected for the ensuing year being well-known provincial motor cyclists. The election of these committee-men provided the most interesting item at the first annual general meeting of the Union to be held in the provinces, which took place last Saturday in Birmingham.

It was a cold, cheerless day, and the meeting was held in a cold, cheerless room in the Digheth Institute, which is located in a cold, cheerless part of the Midland metropolis. This combination of uninviting circumstances probably accounted for the attendance of about one hundred members only instead of a thousand, which could have been expected had conditions been more favourable. However, it was probably the largest annual general meeting in the history of the Auto Cycle Union, which alone justifies the decision to hold the meetings in different centres.

From All Quarters.

London was very strongly represented, however, while Liverpool, Birmingham, Wolverhampton, Coventry, Bristol, Nottingham, and Derby had their representatives. Maj.-Gen. Sir H. C. Holden, K.C.B., F.R.S., was in the chair, and among other well-known figures in the motor cycle world we noticed Majors Axford and Low, Messrs. H. G. Bell, Rex Mundy, A. V. Ebbelwhite, A. H. Lakeman, E. B. Ware, and W. H. Wells as part of the London contingent; Messrs. S. W. Philpott and V. Horsman from Liverpool; J. Simmonds from Nottingham; Capt. Geoffrey Smith and M. Sampson, Coventry; L. Wolstencroft, Derby; S. L. Bailey, Bristol; while Birmingham was represented by Majors Brook and Duke, Messrs. A. D. Arter, F. E. Baker, W. H. Egginton, P. J. Evans, J. L. Norton, P. Gai, J. Stevens, Alec Ross, F. Murray, and S. Rodway; Mr. J. E. Greenwood represented Wolverhampton. Among the many visitors there was Lt. Eno, of the U.S. Army.

The report referred to on page 303 was read by Mr. Loughborough and adopted.

It was moved that the Hon. Sir Arthur Stanley be re-elected president of the A.C.U. for the ensuing year, which was carried unanimously. Maj. Axford then read aloud a list of gentlemen suggested as vice-presidents, viz., Prof. C. V. Boys, F.R.S., Lt.-Col. A. E. Davidson, D.S.O., S. F. Edge, Esq., Sir H. C. Holden, K.C.B., F.R.S., Lt.-Col. D. F. Nicholl, D.S.O., Col. M. O'Gorman, C.B., J. R. Nisbet, Esq., G. F. Sharp, Esq., A. J. Wilson, Esq., Col. Lindsay Lloyd, C.M.G., J. W. Orde, Esq., and A. W. Torkington, Esq. These were seconded by Mr. F. E. Baker, and almost before the meeting realised that they had had an opportunity to nominate others, if they so desired, the nomination was carried *en bloc*.

It was clear that the London motor cyclists had come to Birmingham with

a set programme to obtain control as in the past—a policy which has not been at all popular, as it has been felt that with 15,000 members scattered all over the kingdom, it was not fair to them that the committee should be composed solely of London motor cyclists.

As has been mentioned by *The Motor Cycle*, the A.C.U. must live down the general impression that it is a London instead of a national organisation, and the only way to do this is for the provinces to have a voice in its management.

An R.A.C. guide at the door distributed cards which were reminiscent of electioneering practice. They read as follows: "I am all out for an ultra-efficient A.C.U. Among the host of good men who should represent you the following selection is offered for your guidance. If you know of better men—good enough; if not, plump for the following: Axford, Bailey, Brooker, Carter, Cooper, Feeny, Graham, Morgan, Olsson, Potter, Scott, and Ware. Yours, for efficiency, S. R. Axford (Major), O.B.E."

Of the eighteen nominations for the committee, the following were elected:

Maj. Axford (London).
S. L. Bailey (Bristol).
H. G. Bell (London).
J. W. G. Brooker (London).
W. Cooper (London).
S. W. Philpott (Liverpool).
Maj. Potter (London).
Alec Ross (Birmingham).
Capt. Geoffrey Smith (Coventry).
E. B. Ware (London).
W. H. Wells (London).
L. Wolstencroft (Derby).

Mr. A. W. Torkington, in presenting the balance-sheet, stated that in 1914 there was a loss of £700, and by a policy of rigid economy the committees, with the able assistance of Mr. Loughborough, the secretary, had been enabled to reduce this loss to *nil*. The balance-sheet he presented for the year ended December 31st, 1918, showed a surplus in hand of £180 19s. 2d., less debit balance on January 1st, 1918, of £24 4s. 4d., leaving a sum of £156 14s. 10d.

An Illuminating Address.

During the afternoon the members and visitors were addressed by Mr. E. S. Shrapnell-Smith and Mr. Samuel Henshaw, vice-president of the National Benzole Association, both of whom dwelt at length upon the importance of home-produced fuel. Mr. Shrapnell-Smith's discourse was most interesting, and we regret the space available will not permit a more complete report.

It was not possible to say how long it would be possible to stave off a benzole tax, but great efforts would be made to put back the supertax of 6d. per gallon on petrol.

The speaker made an interesting announcement which has not appeared in the press. This was to the effect that one of the main reasons why the County Council Association withheld their opposition to the Transport Bill was a minute sent to them by Sir Eric Geddes, in which

he stated that the Government will contribute half the cost of main roads and quarter the cost of secondary roads.

While calling for united action as a protection against unfair legislation, the speaker said motor cyclists should form a powerful federation under the A.C.U., distinct from car and commercial vehicle owners—a body standing out for itself, with a clear cut issue, because they ride the lightest motor vehicle.

As an example of what can be achieved by organised members, Mr. Shrapnell-Smith referred to the concessions obtained by the National Motor Cyclists' Fuel Union during the war.

A Benzole Campaign.

Mr. Samuel Henshaw, the vice-president of the Benzole Association, in the course of a long and educating lecture on benzole, said the future of home-produced fuel depended upon the attitude of motorists. It was with regret that he had to tell the meeting that the question of producing benzole from gas was in a very serious position. A good number of plants had shut down, and some had already been dismantled.

Mr. Henshaw endeavoured to show that the present price of benzole was reasonable, but he was not too convincing on this point. He made the important announcement that a company had been formed, which we gathered would be known as the National Benzole Co., for the sole purpose of distributing benzole, and that the new company would open depots in all important centres, with the result that in a very short time it would be possible to purchase benzole in the company's two-gallon sealed tins.

Home-produced Fuels for the Six Days Trials.

Mr. Loughborough expressed an opinion that the ultimate solution to the fuel problem would be alcohol, which, of course, was not suitable for present-day engines, but in the meantime a mixture of alcohol and benzole would be a useful fuel to combat the present high price of petrol. It was quite likely that the 1919 A.C.U. Six Days would be open to members who will agree to run on home-produced fuel alone.

Several other gentlemen, including Maj. Axford, addressed the meeting; which closed about 6.30 with a vote of thanks to the chairman and various speakers.

THE DISPOSAL OF ARMY MOTOR CYCLES.

AT the sale of Army motor cycles held last week at the Agricultural Hall, good prices were again realised. The machines were in the main Rudge Multis, Scotts, and Zeniths, the latter making an average of about forty guineas. Bids from nineteen and a half guineas to fourteen and a half guineas covered the prices that ranged for the Scotts.

A good deal of humour was caused when purchasers of decrepit mounts attempted to wheel the machines home.



Times to Light Lamps.

GREENWICH TIME.

Mar. 27th	...	6.52 p.m.
" 29th	...	6.55 "

SUMMER TIME.

Mar. 31st	...	7.58 "
Apr. 2nd	...	8.0 "

Next Week!

The annual Spring Number of *The Motor Cycle* will be published on Thursday next, the 3rd prox.

Motor Cyclist's Loss of Notes.

Despite advertised rewards, C. R. Collier has obtained no tidings of a bundle of notes, value £116, that he lost after the sale of a motor cycle at Plumstead.

The First Post-war Competition.

To the Cork and District M.C.C. is due the honour of being the club to hold the first post-war reliability trial, which was held on St. Patrick's Day.

Motor Cycling in Belgium.

Belgian motor cyclists, including the passenger in the sidecar, must possess a special permit to travel. These permits have to be obtained from the police station nearest to the place where the driver and his companion reside.

Missing Attache Case.

The hon. secretary of the N.M.C.F.U., Coventry branch, advises us that he lost his attaché case containing important papers at the meet at the Stonebridge Hotel on the 16th inst. It is thought that this was taken by someone in mistake, and that this person will be glad to know the address of its owner, which is 32, King Richard Street, Coventry.

Competition Hill Revisited.

Rex Mundy, the popular rider, is now touring the country on behalf of the A.C.U. He is mounted on a Victory model Matchless, shown on page 312, which, although a new machine, satisfied Mundy as to its power on hills. Being in Cheltenham, the ex-competition rider was tempted to test its capabilities in some of the Colmore Cup trial hills on the Cotswolds, and as the weather and road conditions are now similar to those under which the Colmore Cup was run in pre-war days, he made a short *détour* to take in Gambles Lane (Rising Sun Hill), which he found in a very bad condition. Notwithstanding, Mundy tells us that the Matchless "went up like a bird." It is in revisiting such hills as Gambles Lane that the old competition rider renews the thrills of achievement of by-gone days.

£80 Sidecar.

The writer of "Answers to Correspondents" in a provincial daily evidently has a wrong idea of values. He mentions the price of a 7-9 h.p. machine as £80, or with sidecar £160. We extend our sympathy. We, too, know the difficulty of answering correspondence outside our special sphere. Only last week we were asked to give legal advice concerning divorce proceedings!

Unusual Incident in Dublin.

Two R.A.F. lieutenants had an unpleasant experience recently in Dublin. They were being driven in a sidecar by a sergeant of the R.A.F. when they came into conflict with a crowd watching a funeral cortège. Misunderstanding the instructions of a constable on point duty, the sergeant did not stop, and the on-lookers expressed themselves very strongly on what they considered to be an intrusion among the mourners. The sergeant was dragged from the machine, and sticks were brandished over the heads of the officers. Some members of the crowd took the machine, the quay wall and dropped it into the Liffey.

Special Features.

THE MOTOR SCOOTER.
SOME SPEED SENSATIONS.
THE ENGINE OF THE SIDECAR.

Levis Prices.

The price of the Popular 2½ h.p. Levis is now £44 13s.

A.C.U. Six Days' Trial.

This annual reliability trial, as already stated, will be arranged from a centre in Wales next August or September. In framing the regulations special attention will be paid to light-weights and low-priced machines.

Sale of Motor Cycles at Colchester.

A two days' sale of motor cars, motor cycles, bicycles, and accessories was held at the newly opened motor repository, Maidenburgh Street, Colchester, by Mr. Harry Reeman. A Rover combination Douglas £49, 1914 Sunbeam combination £95, and an Enfield combination £95. The next sale will take place on Thursday, April 10th.



Birmingham N.M.C.F.U. meet last week-end. Inset, Mr. Murray, the hon. sec. of the Birmingham Centre, addressing the members from the Stonebridge Hotel on the "Ways and Communications Bill."

Found.

Mr. A. G. Laverack, of 123, Hewett Road, Harringay, has in his possession four pairs of new Aero piston rings for different engines, which he found in Palmer's Green.

M.C. and A.C. Trial.

A permit has been granted to the Midland Cycle and Athletic Club to hold an open one-day trial on Saturday, June 28th. Maj. Duke has been invited to act as steward for the A.C.U.

The Essex Motor Club.

The Essex Motor Club are holding a dinner at Frascati's Restaurant on Saturday, April 5th. We are asked specially to mention that all members who have served in H.M. Forces are invited to the dinner.

Light Cars and the A.C.U.

Maj. A. M. Low, Messrs. A. V. Ebbelwhite, J. W. G. Brooker, and E. M. P. Boileau have been appointed to represent the A.C.U. on the R.A.C. Competitions Committee on matters connected with light cars.

Sale of U.S.A. Government Motor Cycles.

The United States Liquidation Commission have directed that fifty-eight sidecar outfits be sold by auction at the sale rooms of the Grabame-White Co., Ltd., London Aerodrome, Hendon, on Tuesday, April 1st, at 11 a.m. These machines will be on view Friday, Saturday, and Monday prior to sale. It is announced that sales will take place every Tuesday fortnight.

A Trial of Stock Machines.

On several occasions attempts have been made to organise a trial for standard motor cycles as sold to the public, and the Auto-Cycle Union has been asked more than once to run its Six Days Trials for this type alone. Up to the present, however, nothing has been done in the matter, as it was felt that the A.C.U. was a body the object of which was to improve the breed of the motor cycle, and that it should do its utmost to encourage progress as far as possible; consequently the Union gladly accepted entries from makers of their next year's models, which would not, at the time be sold to the general public.

This is still the general feeling, but the suggestion, which was made by a prominent manufacturer the other day, is a good one, and the A.C.U. should not lose sight of the fact that a stock machine trial would be one of considerable value, and whenever it may be possible to arrange such an event, it would be exceedingly beneficial both to trade and public to do so.

In our opinion, such a competition would best take the form of a one-day trial of motor cycles chosen from manufacturers' stocks of new machines ready for delivery to the public. Such competitions have been run with considerable success in America, and might well be equally successful in this country. A trial of this nature would eliminate departures from standard practice introduced for a specially arduous trial, and a good idea of the performances of the standard makes in skilful hands would then be available to the public.

**AN ELECTRIC BATH CHAIR.**

This little runabout is intended primarily for the use of invalids or for pleasure purposes on good roads. It is driven by an electric motor through a chain to one of the road wheels, and has two speeds and a reverse. The battery is capable of propelling the machine from twenty to thirty miles without recharging. The frame is of steel and the seats are supported on spiral springs.

A New Route.

The county of Notts is to receive £100,000 of the ten million grant by the Government to the cost of road and bridge repairs. Of this sum £50,000 is to be spent in completely resurfacing the road from Nottingham to Bawtry with Tarmac. Sections of the road near Retford, over-grown with grass, have only recently been re-opened by the county council, thus giving Nottingham a direct route to the Great North Road.

Bat Redivivus.

After having been dormant for several years during the war, the Bat Motor Manufacturing Co. is again taking up the manufacture of motor bicycles. Mr. T. H. Tessier will no longer be connected with the firm, but he has been of considerable assistance to it in the process of reorganising, while Mr. S. T. Tessier, his son, will be responsible for the design and production of Bat motor bicycles in the future. Bat motor bicycles have been on the market continuously since 1902, and it is pleasing to note that this well-known name will again figure in the motor cycle world, and that one of the Tessier family, so long connected with this make, will remain a member of the firm. S. T. Tessier, who has been serving his King and country through the whole period of the war, was a consistent and successful exponent of Bat motor bicycles up to 1914. Two models will be manufactured—an 8 h.p. sidecar combination, price £135, and a two-speed 5 h.p. solo machine, price £90.

The Late Dr. W. Watson.

It is with great regret that we learn of the death of Professor W. Watson, D.Sc., C.M.G., F.R.S., of the Imperial College of Science and Technology, South Kensington, formerly chairman of the Expert and Technical Committee of the Royal Automobile Club, and a well-known

authority on scientific matters, including internal combustion engines. Dr. Watson was one of those brilliant scientists who lent his aid to the motor cycle movement, and acted as one of the judges in the A.C.U. Silencer Trials of 1907 and 1913. He was a delightful man, and one whose ability could be hardly guessed in the course of a conversation, but his work for his country has been most valuable, and in no small way contributed to his early death, which was hastened by his experiments in poison gases. Early in the war he was gazetted Temp. Lt.-Col., and became Director of the Central Laboratory, General Headquarters, France.

The Arbuthnot Trophy.

Considerable progress has been made in the organisation of this competition, and very valuable assistance has been rendered by officers of the R.N. undergoing training at Cambridge University. The prime mover of the "Cambridge Navy" is Sub.-Lt. Glen Kidstone, R.N., who served with the late Rear Admiral Sir R. K. Arbuthnot in H.M.S. *Orion*.

It has been decided that the competition will extend over two days, will be held in the West of England, and will be open to solo motor cycles only, so as to emphasise the sporting side of the pastime. The competition will run to a broad schedule, and a winner will be decided on reliability and performance in a flexible hill-climb. In working out the results the cubical capacity of the engines will also be taken into consideration. These technical details are in the able hands of Major A. M. Low, R.A.F., and Mr. A. V. Ebbelwhite. The actual venue of the competition will be announced later, as will also be the exact date, though it has been decided to hold the event in July. The entry fees are £1 1s.

Full particulars can be obtained from the secretary, the Auto-Cycle Union, 83, Pall Mall, London, S.W.1.



Hamilton and District M.C.C.

An effort is being made by the late hon. sec., Mr. J. Law, to reorganise the Hamilton Club. Interested motor cyclists should communicate with this gentleman at Carmaben, Low Waters, Hamilton.

Woolwich M.C.C. (Ladies' Section).

The increasing number of girl motor cyclists on solo mounts is noticeable in S. London. A ladies' section of the Woolwich club has been formed by Mrs. Hardee. Mr. Collier, sen. (of Matchless fame), is presenting a cup for competition, ladies' section v. men's section.

Middlesbrough and District M.C.C.

Activities were recently resumed by the holding of a general meeting. Mr. John Giers was elected president; Messrs. Sidler, Scott, McAdams, Armstrong, vice-presidents; Messrs. Close and Randall, hon. secs.; Mr. J. Gilchrist, captain; and Mr. F. Nixon, vice-captain. It was agreed to protest against the Transport Bill. Twenty-five new members were elected.

Carlyle (Chelsea) C. and M.C.C.

A dance has been arranged to be held in the Chelsea Town Hall on April 11th. Tickets (3s.) obtainable from the hon. sec., Mr. T. Lifferty, 7, Vale Terrace, King's Road, Chelsea. A temporary fixture list, covering April and May, has been arranged, and includes the following: April 20th, run to Guildford; April 27th, Leatherhead; May 4th, Merstham; May 18th, Dorking. Members leave the Fox and Hounds, Putney, at 10.45 a.m. It is hoped to organise picnic runs during the summer. Captain of motor cycle section, Mr. A. E. Littleboy, 8, Fulham Park Garden, S.W.6.

Cork and District M.C.C.

Good weather favoured the Cork and District M.C.C. for its first post-war trial, which was held on St. Patrick's Day, for which there were twenty-seven entrants on machines ranging from a Baby Levis to 7 h.p. Indians. A secret check five and a half miles from the start caught a few competitors napping, and Whitaker (1913 T.T. Triumph) fell foul of a cow and suffered minor damages. Duggan (6 h.p. Enfield sc.) was late at the finish, and was reported held up with a broken chain, while Swanton (3½ h.p. Indian sc.) was also in trouble with his sidecar connections. Subject to confirmation by the Club Committee the results were as follows: 1st, M. J. Hegarty (Baby Levis), New Hudson cup and medal; 2nd, J. P. Frost (6 h.p. Enfield sc.), sidecar prize; E. B. Russell (4 h.p. Triumph), club prize; H. C. Johnson (2½ h.p. Revere), lightweight prize; W. P. Musgrave (4 h.p. Triumph sc.), novice prize; R. Barrett (6 h.p. Enfield sc.), President's prize.

Future Events.

- Mar. 27.—N.M.C.F.U., Leeds. *Whist Drive and Dance.*
 Mar. 30.—N.M.C.F.U., Sheffield. *Run to Matlock.*
 Mar. 30.—Manchester M.C. Rally.
 Mar. 30.—Woolwich, Plumstead, and District M.C. Hill-climb.
 April 5.—Birmingham M.C.C. *Opening Run to Stratford-on-Avon.*
 April 5.—Cumberland County M.C.C. *Special Meeting, Crown and Mitre Hotel, Carlisle, at 6.30.*
 April 5.—Essex Motor Club. *Victory Dinner at Frascati's, Oxford St., W.*
 April 6.—The M.C.C. *Opening Run to Hatfield.*
 April 6.—Woolwich, Plumstead, and District M.C. *Non-stop Trial from Knockholt to Lamberhurst and Back.*
 April 9.—Liverpool M.C. *Annual Meeting, Law Association Rooms.*
 April 9.—York and District M.C. *Opening Run to Farndale.*
 April 11.—Carlyle C. and M.C.C. (Chelsea). *Dance at Chelsea Town Hall.*
 April 13.—Liverpool M.C. *Opening Run.*
 April 13.—Essex M.C. *Opening Run.*
 April 18.—Dorington B. and M.C. *Opening Run.*
 April 20.—Carlyle C. and M.C.C. (Chelsea). *Run to Guildford.*

Manchester M.C.

The opening rally and reunion of members will be at the Swan Hotel, Bucklow Hill, at 2.30 p.m., on Sunday, March 30th.

Active members (old and new), as well as prospective members, are particularly invited to turn up to arrange for the season's programme. The honorary secretary is Mr. Fred A. Eltoft, 133, Oswald Road, Chorlton-cum-Hardy, Manchester.

Essex M.C.

A Victory dinner has been arranged by the above club, to be held at Frascati's Restaurant, Oxford Street, W., on Saturday evening, April 5th, and it is hoped that as many members and friends as possible will take this opportunity of being present. It has been decided that all members on the club's books in August, 1914, who have served in His Majesty's Army, Navy, or Air Force, either abroad or at home, shall receive a free invitation, and the honorary secretary requests that all who are so entitled shall apply to him for tickets not later than the 29th inst., at "Holme Villa," Algiers Road, Loughton. Other tickets can be obtained either from the honorary secretary, or from Mr. F. A. Applebee at 203, Great Portland Street, W., at 8s. 6d. each. An excellent musical programme is being arranged.

The opening run will take place on April 13th, leaving the headquarters, "The Eagle," Snaresbrook, at 11 a.m.

Sutton Coldfield and Mid-Warwickshire A.C.

This club is resuming activities. It has a large potential membership, and it is hoped shortly to revive the Colmore cup trial. The secretary is Mr. F. W. Finnemore, C.A., 122, Colmore Row, Birmingham.

Glasgow M.C.C.

Before the war the Glasgow M.C.C. was one of the largest in the kingdom. It has, unfortunately, lost a considerable number of members on service, including its energetic and popular secretary, Mr. E. W. Theim. The club is now being reorganised.

South Birmingham M.C.C.

About fifty members attended the recent general meeting, and it was apparent that the revival of the club created very keen interest. A great deal of trouble had been taken by several energetic members to collect and clean the trophies and cups for the meeting, which undoubtedly had the effect of stimulating interest in the club. A committee nucleus has been elected, and a further meeting has been called this week to frame a programme, which will include competitions and social events. The following officers have been elected: President, Sir Hallowell Rogers, M.P.; hon. sec. and organiser, E. C. F. Boydell, 93, John Bright Street, Birmingham; hon. treasurer, J. Parman; captain, H. Warden. The headquarters of the club are at the Mermaid Hotel, Stratford Road, Sparkhill, Birmingham.

The Motor Cycling Club.

Members are again reminded of the opening run to the Red Lion Hotel, Hatfield, to take place on April 6th. Those desiring luncheon must apply for tickets beforehand to Mr. A. C. Armstrong, 7, Rosebery Avenue, E.C.4.

The Motor Cycling Club held two concerts last week, which mark the beginning of its new phase of activity after the war. The first, last Wednesday, followed a dinner given to past and present members of the committee. The other concert took place in the Queen's Hall on Friday night, and was attended by some 1,200 people. It was quite the largest affair of this nature which has ever been held by a motor cycling club. The programme, as may be expected, was a first-class one, and the evening was thoroughly enjoyed by the large audience which was present.

In the course of the performance a collection was made for St. Dunstan's Hostel for Blinded Soldiers and Sailors, and a goodly sum was realised for this deserving institution. Quite a number of well-known motor cyclists were present. The chair was taken by Lt.-Col. Charles Jarrott, C.B.E., R.A.F., president of the M.C.C.



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			(to fit 2 $\frac{1}{2}$ " rim)
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Butt-ended	11/9	13/3	15/-

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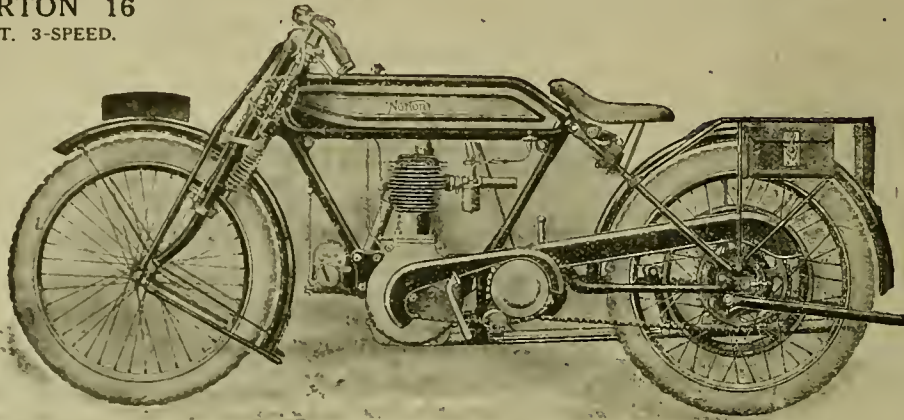
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A scene at the start of the Cork and District M.C.C. opening trial. This was the first of the post-war trials to be held in the United Kingdom.

Wath and District M.C.C.

The opening run of the above club will be to the Dnkeries on Friday, April 18th. Hon. sec., Mr. W. W. Evers, 8, Sandygate, Wath-on-Dearne.

Cumberland County M.C.C.

The committee of this club has arranged to hold a special meeting at the club's headquarters, Crown and Mitre Hotel, Carlisle, on Saturday, April 5th, at 6.30 p.m. All motor cyclists are invited. Hon. sec., Mr. T. Rutherford, 15, Blackfriars Street, Carlisle.

N.M.C.F.U. (Leeds).

Fixtures include a run to Richmond on April 18th and to Scarborough on April 20th. The start is from the Clock Tower, Roundhay Park. The hon. sec. is Mr. T. W. Lancaster, 7, Evelyn Street, Chapel-town Road, Leeds.

Liverpool M.C.

A very successful concert was held on March 19th at St. Margaret's Hall, Park Way, Liverpool, under the auspices of the Liverpool M.C. There were about 300 people present, and a very entertaining programme was arranged by Mr. G. Freeman.

Mr. S. W. Phillpott, president of the club, addressed the assembly. The Liverpool M.C., he said, is the outcome of an amalgamation of four Liverpool motor clubs: the Mersey (Liverpool) M.C., the Liverpool Amateur M.C.C., the Liverpool A.C.C., and the Liverpool Volunteer M.C.C. The funds of each of these clubs had been put together, and were now in the hands of the Liverpool M.C., which is affiliated to the Auto Cycle Union and associated with the Royal Automobile Club, and gives the full advantage of each of these governing bodies, in addition to their own advantages.

Coventry and Warwickshire M.C.

The annual general meeting of the Coventry and Warwickshire Motor Club will be held to-morrow (Friday) at the Towers, Warwick Road, Coventry, by kind permission of the C. and M.C.M. and T.U., Ltd.

This meeting will, in effect, be the revival of this well-known club, the activities of which have necessarily been restricted during the past few years. It is hoped that all present and prospective members will make a point of attending.

It has been decided that the first fifty new members will be admitted without payment of an entrance fee, and that the annual subscription for all members shall be 10s. 6d. Forms of application for membership may be had from the hon. sec., 19, Hertford Street, Coventry.

Mr. Edward Manville, M.P., has kindly consented to be president for the year.

Birmingham M.C.C.

The opening run to Stratford-on-Avon on Saturday, April 5th, is open to all motor cyclists, members and non-members, and it is hoped there will be a huge muster.

To add more interest to this run it is decided to couple with it a speed judging test, to be held on a section of road on the outward journey. Silver prizes will be awarded both to members and non-members.

The start will take place at 3 p.m. from the Nag's Head, Hockley Heath, Stratford Road, ten miles from Birmingham. There will be no entry fees.

It is essential that all motor cyclists who intend to participate should send their names and addresses to the hon. sec., Mr. W. H. Egginton, 76, Earlsbury Gardens, Birchfields, Birmingham, not later than March 29th, to enable suitable arrangements to be made.

The A.C.U. Sixteenth Annual Report.

THE war work of the A.C.U. has been constantly referred to in *The Motor Cycle*. According to the Sixteenth Annual Report, just to hand, the Union is at the beginning of another chapter in its career, and the opportunity which is now presented to make it an even greater force for justice and freedom in the cause of the motor cycle than in pre-war days has been fully appreciated by the Committee.

The A.C.U. is well aware of the value of united and organised effort by all bodies representative of automobilism. The Union has regularly attended all the General Motor Conferences which have been held since the autumn of 1915, and is directly represented on the Motor Legislation Committee. The immediate objects of this co-operation have been the removal of war restrictions on the use of motor vehicles, restoring the roads, and a plentiful supply of fuel.

The A.C.U. has gone ahead well as regards membership since the war finished, and at the time of writing the total paid-up membership numbers 15,859. No elections have occurred since 1916-17, so that in the current year a new Committee will be elected. Almost the last

work of the retiring Committee has been to provide for meetings of the General Committee being held in provincial centres as well as in London, and this scheme will be submitted to the new Committee for consideration and approval.

Appreciation of the Motor Messengers.

Briefly referring to the war work of the Union, it may be mentioned that the total mileage covered by the A.C.U. Motor Messenger Detachment of the R.A.C. War Service was 192,768 miles. The Service has now been suspended, and the following is an extract from a letter received from the G.P.O.:

"The Postmaster General desires me to take this opportunity of expressing his appreciation of the great services rendered to the Post Office during a time of national emergency, and he asks that you will be so good as to convey his thanks to all those concerned who have so efficiently assisted him in maintaining the Telegraph service often under trying conditions."

The report concludes by eulogising the work of the motor cyclists in the British Army, and the Union is proud of their success, because, long before the war, it

recognised the military value of the motor cycle.

Much Touring but no T.T.

Naturally the Touring Department of the Union is engaged in preparing for a busy time in the coming season, and is revising its hotel and repairers' appointments. Unfortunately, it has been impossible to issue a 1919 edition of the "Touring Guide," but it is hoped to publish a supplement embodying up-to-date information during the summer.

The Technical Committee has done a great amount of work in examining second-hand cars for prospective purchasers, and a "catalogue reference library" has been installed embracing the catalogues of all motor cycle manufacturers.

So far as competitions are concerned, the committee regret that, in fairness to the British motor cycle trade generally, they have not seen their way to holding the Tourist Trophy Race in 1919. Arrangements, however, are being made to resume the annual Six Days' Trials, and every encouragement will be given to clubs to revive their sporting activities.

The A.C.U. accounts for the year show a satisfactory balance sheet and a surplus of nearly £191.

IMPROVING THE SIDECAR OUTFIT.

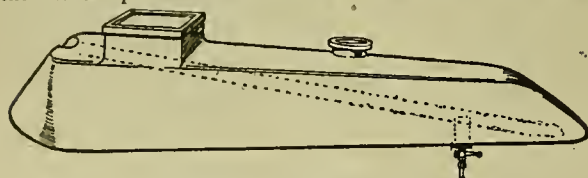
The best sidecar machine specification in the Suggestions Competition invited in connection with our "Which Type" referendum.

IN the sidecar class the ideas submitted were not so profuse with regard to the actual sidecar improvements, most of the suggestions affecting the cycle unit, the requirements of which naturally differ greatly from those of the solo machine. The winner of this section is Major P. H. Lewis, R.E., who details a very complete specification, which is given below.

1. A rustless finish throughout can be obtained as under : (a) All bolts, screws, and nuts (except those inside the engine and gear box, which are always under oil), brake rims and drums, belt pulleys, footrests, pedal levers, and other parts which are liable to friction or abrasion, to be made of stainless steel; (b) rims, either aluminium alloy (e.g., Roman rims) or stainless steel; (c) mudguards of aluminium—they could be of a solid construction without being very different in weight, either way, from steel guards: enamel is seldom satisfactory on sheet metal, as it cracks at the edges, and is also affected by bending of the sheets; (d) handle-bars, hubs, hand levers, and other suitable parts to be covered with celluloid, as on the Rudge; (e) enamel is satisfactory for the frame members; (f) waterproof hubs, with large lubricators designed to take the nozzle of a grease gun; (g) plating is only suitable for springs, and these should be enclosed in leather gaiters and packed with grease.

2. Crank case and gear box should be integral, the base carrying in one casting the gear box, clutch, kick starter mechanism (only the crank and pedal being exposed), first step of the transmission (which should be by gearing, to avoid the necessity for adjustment), oil sump, pump, and lubricating arrangements for gears as well as engine. The whole power unit, in running order, should be readily removable from the frame.

3. The tank should be of the saddle type, and about 10in. wide towards the front, tapering to the rear. A toolbox should be built in one with the tank, on the top at the widest part. Toolbox to be about 10in. x 10in. x 3in.



Saddle tank, embodying toolbox.

deep, sheet metal outside, lined wood, with wooden pockets to hold all necessary tools and small spares. The lid to be fitted with a transparent top, and form a map case, so that the map can be read from the saddle without opening the case.

4. Tank capacity should be $2\frac{1}{2}$ gallons for a medium or heavy weight, the oil being carried in the crank case sump; the last half-gallon of fuel to be available only on turning on a second tap.

5. Filler cap should be at least 2in. in diameter, and towards the rear on the right-hand side of the tank top (the sidecar being on the left). This is for convenience of filling.

6. The number of sizes of nuts to be reduced to a minimum, and all should be placed so that they can be dealt with by an ordinary spanner. One small four-size spanner and one large double-ended loop spanner (for plugs, valve caps, etc.) should be enough to deal with all nuts.

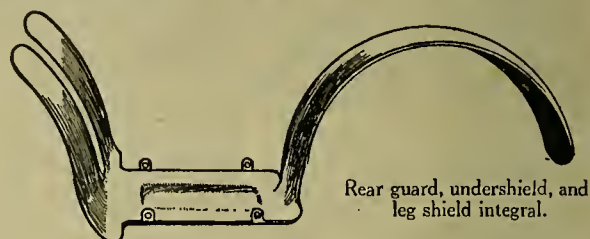
7. Disc wheels.

8. Automatic spark control. There is a definite correct spark timing for every engine speed in a given engine, and this should not require to be controlled by the rider. Magneto systems have been made already with automatic control.

9. Mechanical lubrication, giving forced feed from a crank case sump to all parts of the engine and gear box; the whole arrangement contained within the power unit.

10. Rear mudguard should be extra wide and shallow, built on to the carrier, and continuous at its front end with an undershield. The undershield should close all the space between the footboards, to which it is fastened, curve up in front of the crank case, and also extend into leg shields, as on the Sunbeam.

11. The combined magneto and lighting dynamo should be enclosed in the flywheel. A complete set of electric lamps should be fitted, the head light having a double filament bulb; the high-power filament to be connected so that it is only run by the dynamo. When the dynamo is cut out, the bulbs kept running by the battery should all be of low consumption—hence the battery can be small.



Rear guard, undershield, and leg shield integral.

12. Elimination of clips, small bolts, and nuts and screws, for securing accessories, control levers, etc., i.e., accessories built as part of the machine, is very desirable.

13. The sidecar to be fitted with quick detachable fittings, using brazed lugs on the bicycle. When the sidecar is detached, there should be no loose fittings left on the bicycle, and the latter must be immediately fit to ride solo (e.g., if the battery is carried on the sidecar, it must be capable of being transferred in a few seconds to the bicycle). The sidecar should be regarded as an accessory.

14. Single lever carburetter.

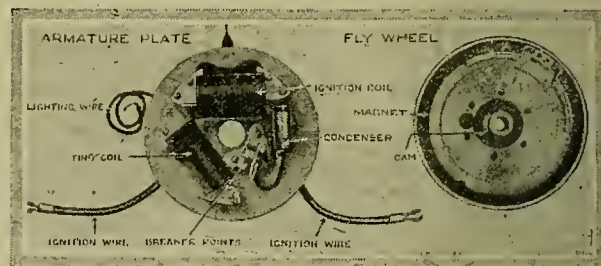
15. Half compression device operated automatically by pressure on the kick-starter.

16. Spring frame—the rear wheel being carried in a rigid triangular frame pivoting on a substantial bearing at the bottom bracket—this being the only pivot on which the rigidity of the frame depends. Carrier to be sprung.

17. Chain drives to be by "silent" chain.

18. Belt drives. Minimum belt sizes: $3\frac{1}{2}$ h.p., 1in.; 5-6 h.p., 1 $\frac{1}{2}$ in.; 7-9 h.p., 1 $\frac{3}{4}$ in.

19. Tyre sizes: $3\frac{1}{2}$ h.p., 2 $\frac{1}{2}$ in. or 650 x 65 mm.; sidecars of higher power, 28in. x 3in.



The two main elements of a flywheel magneto.

20. Silent valve gear; fibre caps on the tappets.

21. Helically cut gear wheels—for silence.

22. Gear control—more particularly for a two-speed—should be by means of a handle-bar lever fitted with a retaining catch, as with the present handle-bar clutch control, but with three positions—lever down, high speed; middle position, neutral; lever up, low gear. This control is more particularly for gears such as the Enfield, which have a non-positive engagement, and so replace the clutch. An alternative control might be by toe and heel pedal.

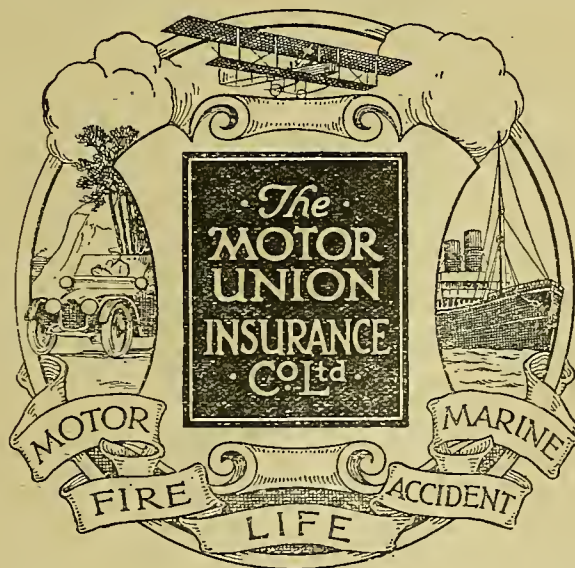
The outstanding features of these suggestions clearly indicate the more urgent problems requiring attention, which are (a) better mudguarding, (b) rustproof finish, (c) more substantial bearing construction, (d) improved transmission systems, and (e) standardisation of small parts such as nuts, etc. These apply equally to the solo and sidecar mounts. As regards the sidecar, the more prominent features are (a) the method of attachment to machines, (b) springing, (c) accommodation, and (d) ground clearance.

SAFETY FIRST!

*Immunity from accident does not exist ;
but the financial consequences are entirely
covered by the MOTOR UNION Insurance
Policy.*

*The motorist who drives an uninsured Motor
Cycle is endangering his bank balance.*

'Phone Regent 2200 or send a card for particulars to

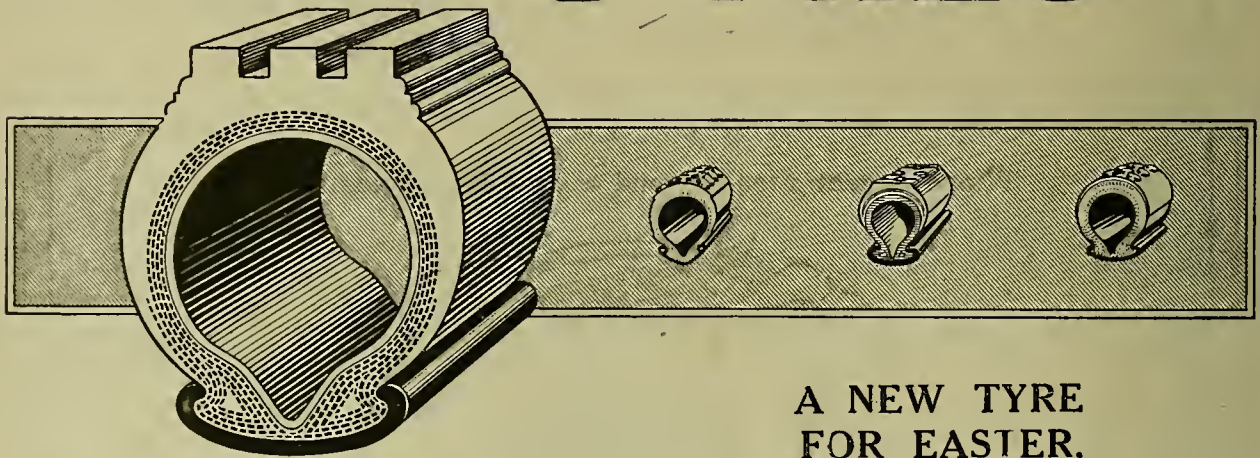


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HUTCHINSON TYRES



BIG THREE RIB

Motor Cycle Rims.

Each.
Heavy Passenger $26 \times 2\frac{1}{2}$ **51s. 3d.**
" " $26 \times 2\frac{1}{2}$ **53s. 6d.**

Voiturette Rims.

650×65 **£3 6 0** each.

Also Rubber Studded
Pattern.

A NEW TYRE FOR EASTER.

Start the Season well. Now is the time to look over your Tyres, and if you have any doubt about them—fit new ones.

It will repay you in extra pleasure and comfort, and tyre troubles so often met with at the beginning of the Season will not be *your* troubles.

THE BIG THREE RIB

of Hutchinson make is a perfect tyre in every way, and made in varying weights and sizes suitable for various uses.

SEND FOR THE
HUTCHINSON TYRE
CATALOGUE.

HUTCHINSON TYRES,
70, Basinghall Street,
London, E.C.2.

"THE TYRE WITH NINE LIVES"

In answering this advertisement it is desirable to mention "The Motor Cycle."



A Commentary based upon Impressions formed after Chats with Manufacturers since the Signing of the Armistice.

Conditions of Overseas Trade.

WHILE a certain number of motor cycle makers in this country are already exporting a proportion of their machines, there appears a tendency at the present time for the majority to overlook the urgency for renewing their export business. With one or two exceptions, they appear to be content to try to cope with the home demand, which they consider will give them far less trouble. Although regrettable, this is perhaps only natural at a time when outputs could be disposed of several times over to buyers in the home country and, while it may not be the soundest business policy, it is the easiest, and, sad to relate, the British motor cycle industry seems to lean toward the line of least resistance.

There are several other reasons, however, why the British motor cycle maker will be late in entering Overseas markets. First, conditions have altered since the makers had their last business dealings with colonial buyers, and much preliminary work in connection with arranging agencies will be necessary. Secondly, Overseas business has not been entirely satisfactory in the past. Thirdly, makers wish to restart their export business on new lines. Fourthly, there is a great deal of trouble in connection with shipping and Government Departments. Finally, there is the question of packing in closed cases at a time when suitable labour is not easily obtainable and timber at a premium and difficult to secure.

Depletion of Office Staffs.

EVEN with the home markets, the makers have not settled down to proper business methods—office staffs have to be re-organised; there are still many gaps in their organisations which they are keeping open for their old servants who are still with the Colours, and they are content to "carry on" as best they can for the time being and dispose of their output to those British agents who "worry them" most.

From the foregoing, it must not be thought that Overseas trade is being neglected, but rather that up to the present makers have not had time seriously to consider the matter. The question of the moment is output, and they can sell all they can make at home without much assistance from their sales organisations which, at the present time, only exist in a nucleus state.

It must not be forgotten that, during the war, office staffs were more disorganised than works *personnel*, and such persons as export managers were among the first to join the Colours or have their

services diverted into channels more useful to a country at war. Many companies to-day find great difficulty in answering foreign and colonial correspondence for the reason that the men who handled it in pre-war days are not now with them. The export packers, too, left the packing shops to meet the Government's call for wood-workers for the construction of aeroplanes. Many of them are now skilled men in the latter line, and will not go back to packing, which comes under the semi-skilled class of work for which lower rates of wages prevail.

Much Ground Regained. UNDER these circumstances, it is easy to be to understand why the average manufacturer procrastinates where Overseas trade is concerned, especially when the old Colonial buyers, having experienced the different methods of American makers during the war, make certain demands relating to supplies of spare parts and alterations to standard design.

It is perhaps only human for the maker to hesitate at the present time, when Overseas business means so much preparation to be satisfactory and the results are not likely to accrue until the next financial year. Makers have lost several months in this financial year, and it is only natural that, to satisfy their shareholders, they wish to make up for lost ground in the quickest possible manner—and that is in the home trade.

A Better and More Far-sighted Policy. AGAINST such a policy much can be said, and we think that, when it becomes absolutely necessary for the makers to find Overseas outlets for their products,

they will experience considerable trouble in recapturing markets which are in danger of being lost. The far-seeing business man appreciates that *now* is the time to lay the foundations of future success, and is catering for Empire trade by exporting a certain proportion of his output, even if he makes less profit on it than upon sales in Great Britain. The loss, if loss it can be termed, he will suffer this year will be very small in proportion to the amount it will cost to enter the Overseas field a few years hence.

For these reasons—and also because we know the Overseas buyer deserves the same consideration as the home buyer—we recommend every motor cycle maker in this country who has suitable Overseas models to look further ahead than he is wont to do. "Sufficient unto the day" should not be the motto of the motor cycle industry of this country.

A Selection of Letters from Readers scattered all over the World.

British Motor Cycles in Canada.

MR. WALLACE R. WARNE, 423, Annette Street, West Toronto, Canada, writes: "As the fact that I advertised for a Triumph motor cycle has already been proclaimed in the pages of the 'Blue 'Un,' it may interest you to know how I was impressed by the machine—a 1913 three-speed model—which came into my possession.

"I suppose this machine would now be considered somewhat antiquated in the Homeland, but it had seen very little service, and proved to be in excellent condition. As winter set in shortly after I bought it, I ran it down into the cellar, and proceeded to acquaint myself with its internals. I found everything in such good order that, beyond removing carbon, I was unable to effect any improvement. Meantime, my admiration for British workmanship was considerably enhanced.

"Before reassembling, I had the cylinder nickel-plated—its appearance being thereby greatly improved—and inserted closely coiled aluminium wire between the fins to assist radiation. I also removed the pedals and chain, and fitted an extra pair of footrests in their place, which served to modernise the appearance of the machine and gave me the option of several changes of position when riding.

"I quickly took exception to the method of releasing crank case pressure through the centre of the engine pulley, which sprinkled me liberally with oil, and drilled and tapped a hole in the rear of the cylinder near the base. Into this, by means of a small brass union, I fitted a piece of $\frac{1}{4}$ in. copper tubing through which the oil spray is blown on to the ground, resulting in a remarkably clean engine.

"Another 'stunt' I adopted was to pack the inside of the valve springs with waste, which I occasionally saturate with oil. This not only lubricates the stems, but protects them from dust and mud, and keeps them in fine condition.

"I have ridden the machine 4,178 miles. Oil consumption was less than one and a half gallons, and a gallon of petrol generally carried me 125 miles. My only troubles were a broken rear axle and a carrier, which persistently misbehaved, breaking at different times in no fewer than four places. The engine cannot be too highly praised. It ran from beginning to finish absolutely without attention. I did not even have to decarbonise it.

"While I consider the Triumph an excellent mount for solo work on good roads, I must endorse the common idea that, for all-round use over all kinds of Canadian roads, a machine in the neighbourhood of 8 h.p. is necessary. A sidecar, with telescopic axle, is desirable for serious touring, as it is often almost impossible to negotiate deep sand or badly rutted roads on a single-track machine. That we must have spring frames, ample ground clearance, extra strong wheels, and large tyres goes without saying.

"I found your 'Reconstruction Number' most interesting, and am very pleased to note that British manufacturers are at last evincing some interest in the Canadian market along the lines I have previously advocated.

"I wish *The Motor Cycle* the success it unquestionably merits, and hope before long to see numbers of British machines that have hitherto been strangers to us."

Eighteen Months on Electrical Henderson.

MR. C. RUSSELL, Sydney, N.S.W., writes: "I decided to sell my light car and buy a Henderson, mainly because I leave home on Sunday morning at six o'clock for a day's fishing, and require something to climb cliffs, traverse bush paddocks, and do general acrobatics. My wife, who always accompanies me, was game to take 'the risk.' We are still going strong!

"Well, this is what I think of it. I use 760 x 90 mm. tyres, and find the mudguard clearance insufficient. I have scrapped the flapper bracket and tail light, and it takes exactly three minutes to detach the back wheel. Also fitted longer rockers on the front fork tips. The dynamo is perfect, no trouble with lighting at any time. The chains stretch considerably. I have used two so far. Schebler carburetter good. The clutch was bad for the first few months. Then I ditched the leaves. It now works perfectly, and I do nearly all driving on top gear. I can do 4 m.p.h. on top with the clutch slipping evenly and smoothly. Of course, if I have to start up on a 1 in 3, or steeper grade, I have to use low gear. I have taken the engine down five times so far, not because

it needed it, but because of a habit I have. The piston tops were very rough, so I have ground them level and polished them; consequently, now have less carbon. All bearings are as new, and will probably outlast the frame. By the way, I have had trouble with the steering head ball races. The gear box (three-speed) is foolproof and gives no trouble, but I would prefer a friction drive in conjunction with a cog drive for starting and steep hills. Consumption, about 45 m.p.g. I have heard that others get up to 90 m.p.g., but I cannot do this on the roads I have to traverse.

"The outfit and sundries cost me £160, but compared with a two-cylinder it was cheap.

"If I can ever procure an English four-cylinder, 28 in. wheels, grip control, foot clutch, foot brake, 10 h.p., good mudguard clearance, it is mine; but it may be another 100 years, alas!"

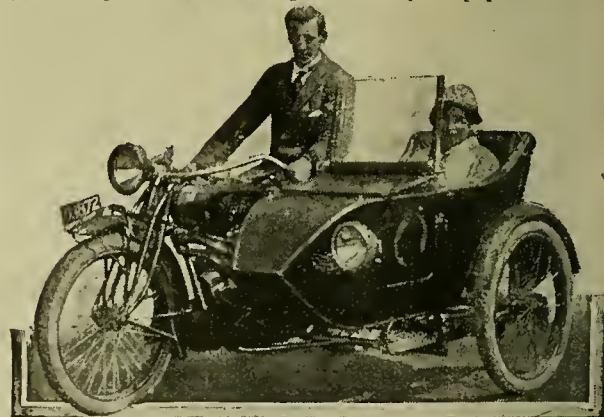
Prices of New Machines.

MR. E. F. JENKINS, of *The Cape Times*, Cape Town, S.A., writes: "May I beg of you on behalf of colonial riders to add to the good work you are doing on behalf of the motor cycling movement by using your utmost influence with the British manufacturers to keep their prices down to the smallest possible figure? The prices of new machines as announced in your columns have filled us with dismay, and we are wondering what we shall be asked to pay for post-war models. Fortunately for the English maker, the South African agents of American motor bicycles seem to be slow in cutting prices. £110 is the retail price of a 7 h.p. Harley-Davidson solo. We have had to put up with American components for a couple of years past and the result has been to enhance the reputation of British goods, whose superiority in the way of chains has been particularly marked. I would suggest that the motor cycle manufacturers fix the prices, beyond which their machines shall not be sold retail."

The Motor Cycle and American Riders.

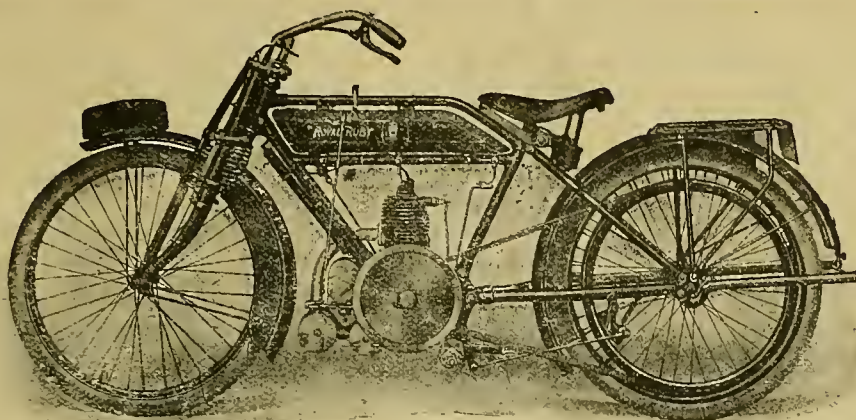
MR. A. ANDERSON, 630, Bingham Street, Reading, Pa., U.S.A., writes: "While in the service of the United States Army at the training school for motor cycle mechanics at Pittsburg, I became acquainted with a man who has been getting your journal for four years. I do not recall his name, but he gave me your New York address. I brought a copy home with me, and the Reading Motor Cycle Club, of which I am a member, voted at once to subscribe to it. We are very pleased with it. As you know, Reading is the home of the Reading Standard, and I believe you will admit it has got some pep. Out of 200 members of the club 75% were in the Service. We are one of the leading clubs in the country for boosting the sport, and have a busy season in front of us in the line of racing and endurance runs. We are always on the lookout for something new, and that is our reason for subscribing to *The Motor Cycle*. We find it a change from our magazines at home.

"Well, I have told you enough. I hope if you find room you will place this little expression in your paper."



Mr. Harold Burrow, of Dunedin, N.Z., aboard his Indian sidecar. He was the winner of a recent reliability trial from Dunedin to Timaru and back, a distance of 258 miles.

ROYAL RUBY



2½ H.P. 2-STROKE LIGHTWEIGHT An opportunity for Easter.

Those looking forward to the Easter holiday will find the Royal Ruby 2-stroke single-speed Lightweight just what they are wanting. With the Royal Ruby special frame with Patent Safety Stays, Villiers 2½ h.p. 2-stroke engine, Dunlop motorcyclette 26in. x 2in. B.E. tyres, Dunlop belt, and Brooks saddle, it is, without question, at £40 nett cash, the best value on the market.

**THE ROYAL RUBY CYCLE CO.,
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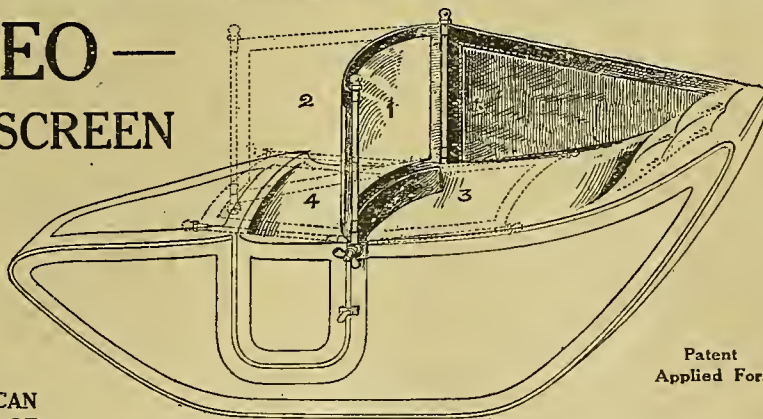
THE SCREEN IS FLEXIBLE AND CAN
BE BOWED TO SUIT SIDECARS OF
VARYING WIDTHS.

TO GARAGES. Ensure deliveries by ordering at once. You will be asked every day for "CAMEO" WINDSCREENS.

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The G.N. is exceptionally accessible. The detachable cylinder head, always a feature of the G.N. engine, and now being widely adopted by other makers, is extremely simple to detach, no skill, either, is needed in re-making the joint. Decarbonisation is thus doubly simplified, for not only is the head easier to detach than the ordinary cylinder, but the carbonised surfaces are immediately "getatable."

In the event of tyre trouble, the easily detachable wheel can be replaced by the spare, which procedure will appeal to owners of sidecars, combinations, in which structural design impedes tyre replacement. Further details and specifications from

G.N., Ltd., Etna Works,
Albert Road,
Hendon,
N.W.4.

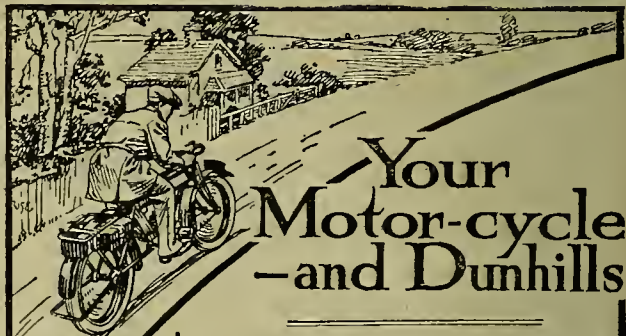
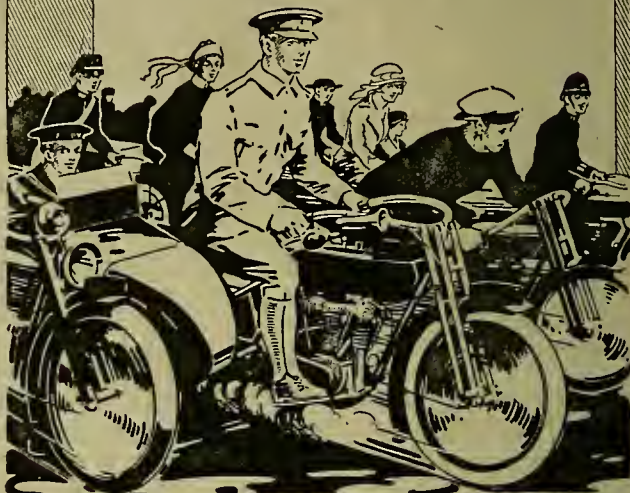
Raymond.

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Vulcanisers.
Etc. Etc.

It is all very well to picture that whirl through the countryside as one long spell of unbroken pleasure. But it is more practical to reflect on the possibilities of mishap and to anticipate the troubles that may arise. It is still more practical to arm yourself with all those "Motorities" which add to the joy and enable you to deal promptly and effectively with "troubles." It is not good to find yourself in difficulty just as the shades of night are falling and you at a spot "miles from anywhere." Be a "road-wise" motorist and equip yourself fully and efficiently at Dunhills.

Drop us a card as to what you require, and we will send you particulars and quotations.

Dunhill's LIMITED.

LONDON—359-361, Euston Road, N.W.1

Telephones 3405 and 3406 North.

GLASGOW—72, St. Vincent Street.

Telephone—7649 Central.

A SCOOTER CARTOON OF 1912



Twelve years ago a mild enthusiasm was created by the advent of the motor scooter. No one took it seriously, however, and we reproduce a sketch that appeared in *The Motor Cycle* in the issue of March 21st, 1912, humorously depicting the contortions of a rider as he might appear in a scooter T.T. race.

ALUMINIUM ENGINES.

THE one direction in which there seems promise of considerable improvement in motor cycle design is that of weight reduction. In trying to reduce the weight of a machine there could be no better starting point than on the engine, as this is the heaviest individual part. Improved engines mean smaller engines, which in turn mean smaller and lighter machines, as the frame, wheels, etc., have less to carry.

When the price of aluminium comes down again to a reasonable figure—and there is no reason why it should not be even cheaper than in pre-war days—engines constructed mainly of aluminium may be developed. It is an open question whether aluminium cylinders need have iron liners.

It would seem that if an aluminium alloy, having bearing properties like those used for pistons, were used, the requisite durability might be obtained without liners.

It is said that with cast iron pistons in aluminium cylinders the wear on the cylinder walls certainly would be less than the wear on an aluminium piston in a cast iron cylinder. Gudgeon pin bearings directly on the aluminium of the piston bosses are now successfully used, and the pressure on these bearings is considerably greater than the pressure on the cylinder walls, though the surface speed, of course, is naturally less. With cast iron pistons in an aluminium cylinder, exactly the same bearing conditions as with aluminium pistons in a cast iron cylinder prevail; but as cast iron on cast iron has good bearing properties it is not improbable that aluminium alloy would give equally satisfactory results.

Before the war experiments were being made in this country with an "all-aluminium" car engine, in which cylinders, water jackets, crank case, pistons, and even the valves were of aluminium alloy.

VEDETTE.

ROAD REPORTS.

West of England.—We have received information that the following roads are in an exceedingly bad condition: Both roads from Barnstaple to Ilfracombe, Barnstaple to Combe Martin, Barnstaple to Lynton, and all roads in a triangle drawn from Barnstaple, with Ilfracombe and Lynton as the ends of the base. The road along the coast from Combe Martin to Ilfracombe is impassable, owing to a landslide, and will be out of repair for many months.

Main road from Reading to Exeter.—In good condition as far as Hungerford, then bad to Pewsey. Improved surface from Pewsey to Westbury, and fair to poor between the latter and Castle Cary. From Castle Cary to Ilminster, good. From Ilminster the road becomes hilly and of uneven surface, though it improves about five miles before Honiton. Between Honiton and Exeter, good Tarmac surface. Bad through Honiton.

Exeter to Dartmouth.—On the whole, fair. Very bad until two miles out of Exeter, when the surface improves. Tramlines at Torquay and Paignton (coast route); rather trying with a lightweight. Fair from Paignton to Dartmouth.

From Exeter to Bath *via* Taunton and Shepton Mallet.—Good main road to Taunton, with a few bad patches. These are being rectified, however. Taunton to Shepton Mallet, fair, but good in parts. Shepton Mallet to Bath, bad, especially through Radstock. Condition of roads into, through, and out of Bath very bad, with large pot-holes.

Bath to Chippenham.—Good.

Chippenham to Oxford *via* Calne and Swindon.—Chippenham to Calne, good. From Calne to Swindon through Wootton Bassett, *very bad indeed*. Bad through Swindon, and then indifferent, with good and bad stretches, to Oxford.

Bristol Road from Worcester to Birmingham, fairly good, excepting in suburbs of Birmingham.

Uxbridge.—Tram lines in Uxbridge very bad.

Oxford Road in very bad condition, near Gerrard's Cross almost unrideable. Oxford to Cheltenham, quite good.

Birmingham.—The Chester Road, in the vicinity of Erdington and between Erdington and Castle Bromwich, is beyond description.

Lancashire. Liverpool-Southport (*via* Aintree and Maghull).—Very good condition.

Manchester to Southport.—Route *via* Chorley recommended. Turn left in Irlam avoids Bolton. From Chorley *via* Croston. Plenty of signposts.

Southport to Stockport, *via* Ormskirk and St. Helens, Great Sankey, Warrington, Altrincham, Cheadle, Heath Station, and Stockport.—Very good to St. Helens, but painful exit for one mile. Remainder very good. Alternative route *via* Knowsley village and Prescot recommended. Turn right at Rainford. Adds two miles.

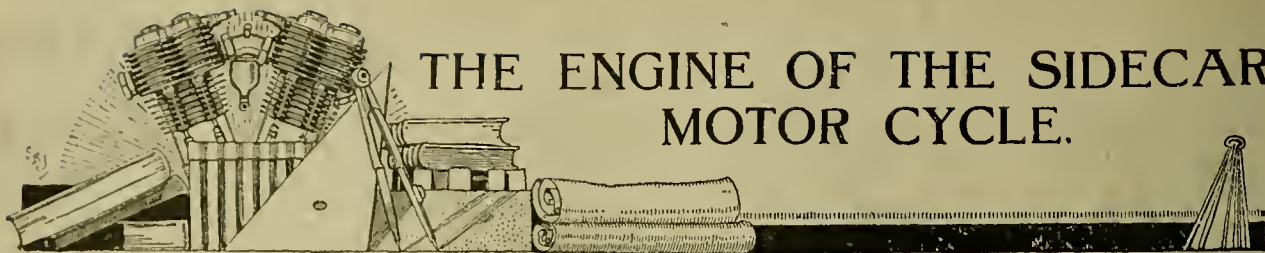
Warrington to Prescot.—In perfect condition.

Prescot to Liverpool.—Poor.

Manchester to Northwich.—In perfect condition.

Oswestry to Birkenhead.—Majority very good, but the stretch from Cefn to Ruabon is simply atrocious.

Chester to Birkenhead.—Very good.



Extracts from a Paper read Last Week before the Institution of Automobile Engineers, and the Discussion which followed.

ON Thursday of last week, at the Chamber of Commerce, Birmingham, Mr. Eric Caudwell read an interesting paper on the engine of the sidecar machine, which, more or less, was a sequel to the general survey and criticism of the motor cycle that was made by Mr. D. S. Heather in his paper read before the same body on February 20th.

"Probably because the motor cycle is much less developed, the average purchaser is far more critical than the purchaser of a car," said Mr. Caudwell. "Now the engine of such a car is practically free from mechanical noises, is so well balanced as to operate over its whole speed range without sufficient vibration to cause inconvenience, is flexible, and will give a practically constant torque over at least half its revolution range, will run 5,000 miles without requiring to have the carbon cleaned out or the valves ground, and 10,000 miles without dismantling for adjustment of any of the working parts: its lubrication is entirely automatic, and needs no attention on the part of the driver except an occasional replenishment of the oil supply, and, once the carburetter is correctly set, no skill is required for its manipulation, while all the working parts are entirely enclosed, and no adjustments are necessary between the periodic overhauls."

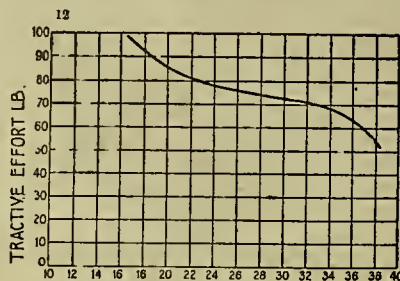
To show that this ideal is attainable by the motor cycle engine, and to indicate the lines along which it may be reached, was the purpose of Mr. Caudwell's paper.

Only engines of over 500 c.c. piston displacement were dealt with, as with the volumetric efficiencies at present attained, a smaller engine was considered quite unsuitable for serious sidecar work.

Cylinder Cooling.

"Air-cooled engines only are dealt with," said Mr. Caudwell, "as sufficient experience has now been acquired to show that in the range of sizes under discussion, water cooling is a quite unnecessary elaboration. Air cooling would be perfectly satisfactory under right conditions, but very little attention appears to have been given to it by the designers of motor cycle engines."

"A careful examination of a cylinder of, say, a 1906 $3\frac{1}{2}$ h.p. Minerva engine and any 1919 cylinder shows no essential difference whatever in design except that the valves and passages are slightly larger, but the pitch, number and disposition of the cooling ribs, and the thickness of the walls, remain practically



Graph showing the tractive effort of a 4 h.p. motor cycle engine in relation to road speed.

unchanged. It is really surprising that engines keep as cool as they do when the obstructions to the direct flow of air to them are considered, the cylinder being usually placed behind a tube which is not streamlined, while in front of that is a mudguard, which may be anything up to 8 in. wide, and might have been designed for the express purpose of acting as a scoop to deflect the air away from the cylinder, while the magneto is also frequently placed in front. In the same way there are tubes and mudguards in the rear to obstruct the closing in of the slip-stream, if one should ever be formed. It is to be seriously questioned if our much talked of experience with air-cooled engines during the war has taught us a great deal that will be of use when applied commercially. Better cooling is undoubtedly badly needed, as

it will give longer life of valves, less carbonisation, and, in permitting the use of a higher compression ratio, will improve thermal efficiencies."

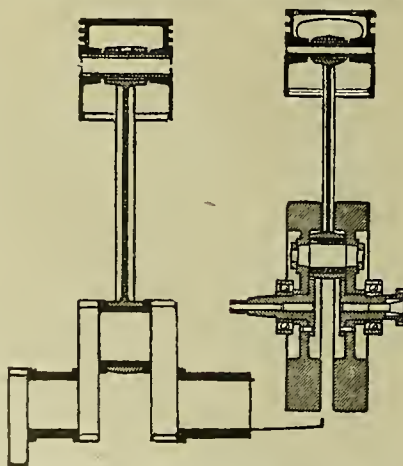
As an indication of the large scope for improvement, Mr. Caudwell gave a chart showing the tractive effort of a 4 h.p. motor cycle engine. This is reproduced here, and it will be noted that, while it amounts to 90 lb. at 18 m.p.h., it falls away steadily until at the very moderate speed of 36 m.p.h. it has dropped to 64 lb., showing that, as the engine revolutions increase, the mean effective pressure steadily decreases. This indicates not only inefficient cooling, but restrictions in the valve ports and passages. As a fully laden sidecar outfit may weigh 700 lb., the commencing values are quite creditable, but the engine should hold its torque over a considerable range before the curve turns downwards.

The speaker had many things to say about engine balancing and crank effort, and his deductions were made from examination of various modern engines. His remarks on these subjects were very interesting, and may form the subject of a separate article in a subsequent issue.

Crankshafts and Flywheels.

Mr. Caudwell said he could not understand why makers of single-cylinder and V twin-cylinder engines, with few exceptions, have always placed the flywheels inside the crank case. "The disadvantages of this method of construction are numerous and obvious," he said, "while advantages seem to be non-existent. A car engine with an 85 mm. bore cylinder has a crank pin about 2 in. diameter by 2 $\frac{1}{2}$ in. long, so that it is extraordinary that there should be many thousands of motor cycle engines running with crank pins only $\frac{3}{4}$ in. in diameter by 1 $\frac{1}{2}$ in. long, and still more extraordinary that, although the oil is only fed in a most erratic manner with a hand pump, they may yet last 5,000 miles without requiring renewal—that is, about six months' work for a fairly hard rider. Although some improvement has been effected by the use of roller bearings, these can hardly be regarded as a satisfactory solution of the problem in view of their small size and the heavy loads and shocks to which they are subjected."

The placing of the flywheels inside the crank case means, too, that the diameter cannot exceed about eight inches, so that they have to be unduly heavy. The average weight is from 25 to 35 lb. the pair, which is about one-



Section of crank, piston, and connecting rod of a 90 mm. x 130 mm. car engine and 85 mm. x 98 mm. motor cycle engine. Both are drawn to the same scale.

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What do you know about your motor?

An Important Work for every Motor Cyclist

The time is past when it required an expert engineer to drive a car, but a working knowledge of the various parts of a car and their functions is still essential to really successful driving, and the importance of this work to every owner and driver of a motor car, cycle, or cycle car can hardly be over-estimated.

"The Book of the Motor Car" is the first really comprehensive work on motor cars, cycle cars, and motor cycles ever published. By the careful study of its chapters the rawest amateur can learn the principles upon which his car works; but at the same time it is so comprehensive and so striking in its detail that even the skilled man will find it a book of enthralling interest and extreme utility, while the practical motorist will find it quite indispensable. It should be as much a part of the equipment of a garage as an oilcan or a lifting jack. Reading its chapters, even the most expert driver will find himself gaining a fuller understanding of points that he thought he understood already, and learning hints that will enable him to increase the efficiency of his mount in a surprising manner.

Driving and Repairs.

"The Book of the Motor Car" is full of invaluable information on all problems of driving and repairing a car, instructions being given for all possible difficulties in language that can be understood even by the most unmechanical mind. The following are a few of the subjects dealt with:

Cylinders, valves of all kinds, different types of engines, carburetters, ignition, silencers, gear and clutches, radiators, cooling systems, brakes, lubrication, lighting systems, wheels, tyres, fuels and how to use them, tools, and repair appliances, etc., etc.

Cycle Cars and Motor Cycles.

The work pays full attention to motor cycles and cycle cars, full details and instruction being given for all those points wherein they must be treated differently from the most powerful motor car. In these and all other respects "The Book of the Motor Car" is in line with the very latest discoveries in motor engineering. It is profusely illustrated with full-page plates, drawings, in plan section and elevation, diagrams, and photographs, as well as a series of sectional movable models in colour.

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Burnley, 17/3/19.

Dear Sirs,

I have decided to send the Douglas Machine per passenger train, as I find that it takes about 14 days to send goods to London, therefore I thought this would be best.

I have packed engine in good strong case, and trust same will arrive well.

Thanking you very much for your prompt attention to all my letters, and the business-like way you carry things out.

Yours faithfully,
(Signed) H.T.

(Original or above letter may be seen at our offices.)

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MOTOR CYCLE

ACCESORIES.

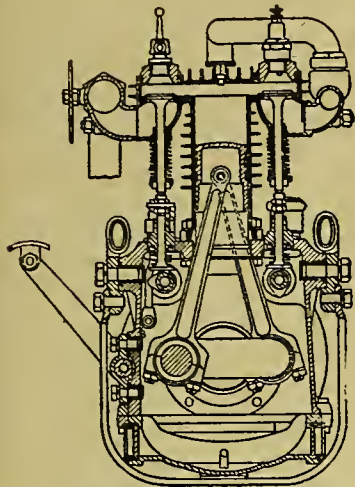
The accessories of a motor cycle are of two kinds—necessities and luxuries. Amongst the foremost of the former is an Insurance Policy in a substantial office giving full and complete cover. Both these conditions are fulfilled in the Pooling Insurance Policies. Cost price Insurance always.—Licenses and General Insurance Co., Ltd., 24, Moorgate Street, E.C.2.

The Engine of the Sidecar Motor Cycle.

third the total weight of the engine. Bearing sizes, too, seem quite inadequate, although these are usually of the ball or roller type. Although it is a wonderful testimonial for the makers that these bearings may have a life of over 10,000 miles.

Piston and Connecting Rod.

"The restrictions connected with the use of internal flywheels limit the distance between them to about 3in., so that the connecting rod is not wide



Cross section of the 7 F.N.

enough to resist transverse strains. This results in the rod springing, so that it is usual to find that the gudgeon pin is not parallel with the crank pin after a very little use."

In Mr. Caudwell's opinion, the lubrication of most English engines seemed to be in an embryonic state, and that the Americans have a decided advantage, as mechanical oiling is universal on their machines.

The speaker thought that in the motor cycle sizes of engines there was no need to consider forced lubrication, the trough system being adequate.

Mr. Caudwell stated that of all types of engines the single was heaviest, largely on account of the heavy flywheels required, especially when placed inside the crank case. One popular engine weighed 68 lb., but the average, he said, was 85 lb. The V twin was somewhat better, the average weight being about 100 lb. for the 1,000 c.c. engine. He could not give the weight of flat twins, but the four-cylinder, he said, was the lightest of all. The 1,170 c.c. four-cylinder Henderson, complete with clutch, gear box, kick starter, magneto, carburetter, and silencer, weighed only 128 lb.

In concluding, Mr. Caudwell said: "Our requirements are fulfilled in the largest measure, and about equally, by the flat twin and four-cylinder engines. The flat twin engine has certain advantages in the way of fewer working parts, but, as generally placed, the cooling of the back cylinder is very inefficient, and the cylinder is also inaccessible; in fact, it cannot be removed without taking the engine out of the frame.

"Doubts are often expressed as to the advisability of placing a four-cylinder engine in the hands of an unmechanical public, but the success of the owner-driven light car should be sufficient to dispel any fears on this score.

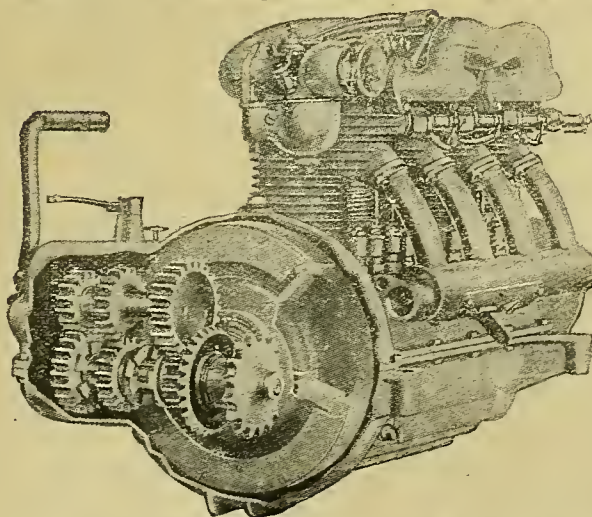
"When the motor cycle becomes as good as the car it will be similarly left alone, except by the negligible few."

THE DISCUSSION.

The discussion which followed the reading of the paper, while interesting, was more of a general nature than one would have expected from an assembly of upwards of a hundred members of the manufacturing trade. Among others present we noticed Messrs. V. A. Holroyd (Rudge), George Stevens (A.J.S.), G. E. Stanley (Triumph), T. W. Blumfield (Abingdon Ecco), J. E. Greenwood (Sunbeam), Norman Downes (New Imperial), G. E. Evans (O.K.), W. Hughes Butterfield (Levis), J. Duffy (Valveless), J. Clarke (Ariel), A. A. Austin (Coventry Simplex), — Ireland (Thomson-Bennett), Alec Ross, and Major Axford.

Mr. V. A. Holroyd, called upon by the Chairman (Mr. A. A. Remington) to open the discussion, said he could not understand why Mr. Caudwell should expect motor cycle engine makers to embody crank pins 2in. diameter when present-day machines gave the service they did. On the question of inside flywheels, Mr. Holroyd pointed out that the designers' scope was limited to a large extent by the ground clearance on the one hand and the tank on the other. He agreed that the next step in motor cycle design might be a four-cylinder machine with shaft drive which would eliminate chains and chain cases.

Mr. George Stevens agreed with this latter statement from Mr. Holroyd, but he added a rider to the effect that, after all, a motor cycle is not a car, and that most motor cyclists could not afford such a machine. The single and twin, Mr. Stevens said, were comparatively cheap to produce, because they were simple, and whatever developments there might be in four-cylinders, there would be a big demand for the simpler type for some time to come. Admitted, a motor cycle is not so clean as a car, but he questioned whether motor cyclists expected this.



The power plant of the Henderson four-cylinder motor cycle.

Mr. J. E. Greenwood agreed with most of Mr. Caudwell's paper concerning four-cylinder engines from an idealist's point of view, but as a commercial proposition it was a very different matter. The single of 500 to 600 c.c., he maintained, was simple, economical, and reliable, and although theoretically it was impossible to balance, the bad balance could be reduced. He mentioned one factor which was not frequently referred to as a point in connection with the balance of a single: this was that the centre of the mass weight of the flywheels being in a direct line with the centre of the reciprocating mass, the anvil action of the flywheels absorbed a very large proportion of the vibration caused by the unbalanced reciprocating mass.

Mr. Blumfield referred to the limitations in space to embody larger bearing surfaces, but he did not know of any design which embodied bearings of the size quoted in the paper. In reply to the contention of the author that motor cycles were in constant need of attention, Mr. Blumfield thought they would be much better if left alone by their owners.

Mr. G. E. Evans, of Messrs. Humphries and Dawes, said it was futile to compare a motor cycle with a car, and cited the single as being probably the most reliable machine suitable for the man in the street, and that, irrespective of other developments, it would retain its prominence in the motor cycle world.

The four-cylinder machine was coming, thought Mr. Butterfield, but it would be expensive. There was no doubt about the market, as there was always a class of buyer prepared to pay high for an ideal machine.

Mr. G. E. Stanley suggested that in some respects the car engineers had much to learn from the motor cycle engineers rather than the other way round, while Major Axford stoutly defended the modern motor cycle, and referred to its economy in upkeep, especially as regards overhauling and replacement parts, as compared with a car. He thought Mr. Caudwell was chasing a shadow, and that the two types of vehicles were entirely distinct.

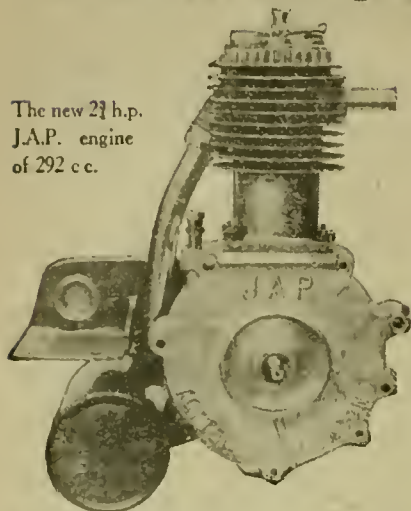
Other speakers included Messrs. J. Clarke, A. A. Austin, and D. S. Heather.

In his reply, Mr. Caudwell stated that to imagine that all motor cyclists are sportsmen was a mistake, and that makers will not tap the largest market until they cater for men who are not sportsmen. In reply to the several suggestions that the four-cylinder would be expensive, he said the price of the pre-war 7 h.p. F.N. was £78, and that the American Henderson also was sold at a price competitive with other types. He agreed that singles and twins did their work well, but suggested that we wanted something better.

THE 1919 J.A.P. LIGHTWEIGHT ENGINE.

Increased Radiating Surface — Chain-driven Magneto — Improved Valve Lifter.

The new 2½ h.p. J.A.P. engine of 292 c.c.

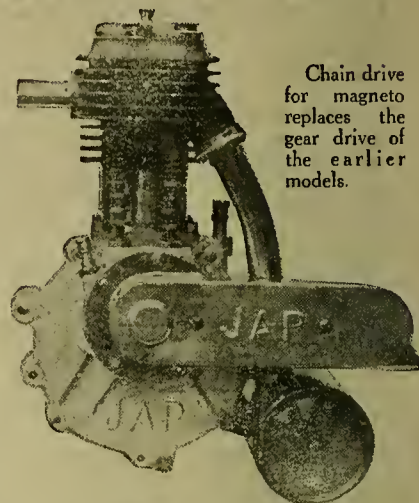


being more aptly rated in the future at 2½ h.p. Its bore and stroke are 70 mm. x 76 mm., and the magneto, which was formerly gear-driven, is now chain-driven, the cover of the chain casing serving as part and parcel of the timing gear cover and forming also a platform for the magneto.

Exhaust Valve Lifter.

The engine has been improved further by the fitting of a simple and ingenious internal exhaust lift, and the provision of two bearings for the large timing wheel spindle, one in the inside of the timing gear case and the other in the cover. The boss of the latter serves as a bearing for the lever, of which the cam forms a part, actuating against the heel of the exhaust rocker, thus serving to raise the exhaust valve.

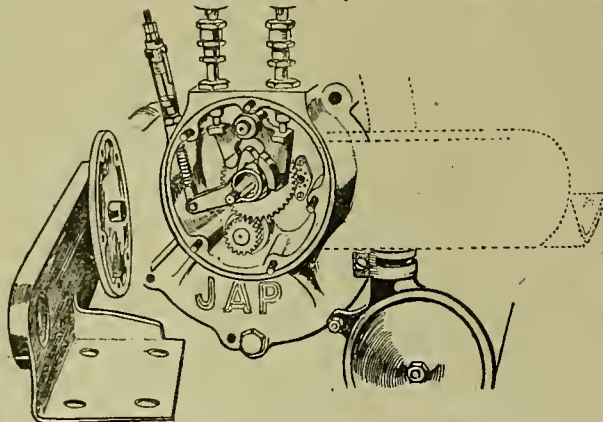
In our illustration the ingenious Bowden wire fitment and the internal exhaust cam lifter are clearly shown. The crank case



Chain drive for magneto replaces the gear drive of the earlier models.

AFTER years of war and munition work it was distinctly refreshing to be able to go through Messrs. J. A. Prestwich's works at Northumberland Park, Tottenham, London, N.W.17, and see the old familiar parts on practically every machine tool, showing great activity in the factory and a rapid production of J.A.P. engines.

The little 2½ h.p. has progressed considerably in design, so much so that certain modifications in the cylinder, such as the increased size of the radiating fins, have resulted in the engine



Timing gear of the new J.A.P. lightweight engine, showing integral magneto platform and timing case cover.

of this engine is now entirely oil-tight, and on referring to one of the photographs it will be seen that a special oil ring is cast on the pulley side of the crank case, so as to catch any excess of oil which might leak through and drain it neatly away without soiling the crank case. Some improvement has also been effected in the silencer, which is now of ample dimensions and of pressed steel. The valves are large, and the tappets adjustable. Altogether, the new 2½ h.p. J.A.P. is a thoroughly clean job, and highly suitable for light and mediumweight motor cycles.

As this engine is one of the few four-strokes under 300 c.c. capacity on the market at the present time, undoubtedly it will be in great demand from the many smaller makers who specialise in solo motor cycles. Already we have dealt with several such machines, the demand for which considerably exceeds the supply.

WOLF PEACE MODELS.

A New Lightweight fitted with a J.A.P. 2½ h.p. Engine and Countershaft Gear.

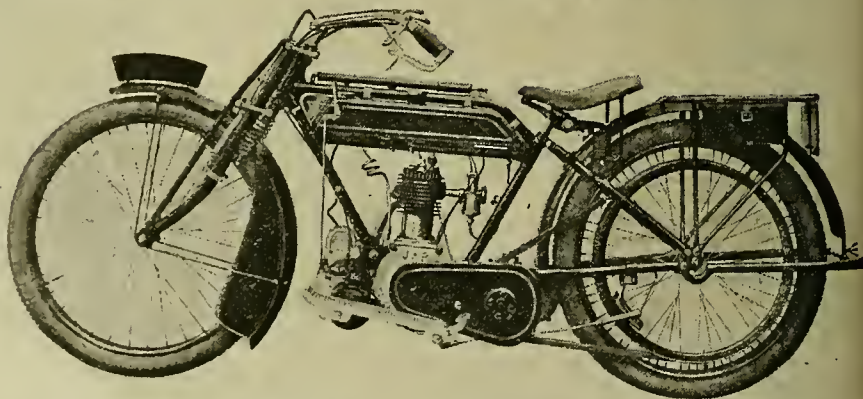
ALTHOUGH there is nothing strikingly new in the 1919 Wolf-Jap lightweight, it will interest our readers to know that the old-established Wolverhampton firm has decided to make such a model. The machine is fitted with the new J.A.P. lightweight engine, the 1919 improvements of which are described in some detail in the preceding article.

A two-speed countershaft gear, with clutch and kick starter, is fitted as standard, the gear being controlled by means of a gate change fitted underneath the tank, and the clutch by Bowden lever on the handle-bar.

The specification includes Lion variable magneto, Amac or Senspray carburetter, Druid forks, Lycett's pan-seat saddle, two toolbags with tool roll and full kit of tools, large aluminium footboards, Best and Lloyd drip feed pump, and 26x2½ in. tyres. The price is 56 guineas.

A 4 h.p. four-stroke and three Villiers-engined two-stroke models will also be marketed. The prices of the latter are £40 for single gear, £48 with two-speed,

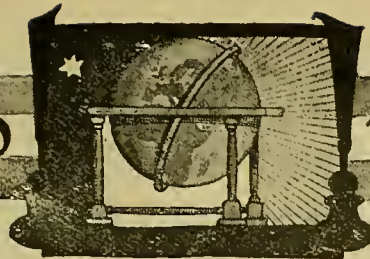
and £50 with two-speed, kick starter, and clutch. The 4 h.p. J.A.P. - engined medium-weight with Sturmey-Archer countershaft gear is listed at £84.



The latest Wolf lightweight with a 2½ h.p. J.A.P. engine and two-speed countershaft gear

LETTERS TO

THE EDITOR



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle" Hertford Street, Coventry and must be accompanied by the writer's name and address

GUDGEON PIN FIXING.

Sir,—Just a line to point out that the idea of the fixing of the gudgeon pin of the Vermorel car is not new. I have an old Minerva motor cycle with the gudgeon pin fixed in exactly the same manner. Also I should like to point out that the extraction of the locking-pin presents no difficulty whatever, and has given no trouble. R. WORSSELL.

WAYS AND COMMUNICATIONS BILL.

Sir,—Will you permit me the hospitality of your columns to explain to your readers the result of the debate in the House of Commons?

A large number of members were acting in co-operation with myself to protect the roads from the dead hand of the Railways; but the general feeling of the House was so strongly in favour of the Bill—at all events so far as it affected railways—that, after giving the fullest consideration to the matter, we felt that we could not divide against the second reading of the Bill.

I need hardly say that at a later stage of the Bill we shall move to omit roads from the powers of the new Minister with a view to constructive legislation for the development of roads and road transport being dealt with under a separate Board, and on this we shall most certainly divide the House, and I hope to receive support from those members—I believe the majority of the House—who, in their hearts, are opposed to this gigantic monopoly. W. JOYNSON-HICKS.

A CHALLENGE ACCEPTED.

Sir,—On passing through Wisbech, Cambridgeshire, on Wednesday afternoon, March 12th, I was interested to observe a challenge in the window of Mr. Bryan B. Ames; motor engineer, of Lynn Road, Wisbech, stating he was willing to match his 2½ h.p. Allon against any other make of two-stroke of the same h.p. for £100. I desire to accept his challenge, and would be glad to arrange a race from fifty to a hundred miles with my 2½ h.p. Ivy two-stroke of 224 c.c.

In the event of Mr. Ames agreeing to accept the challenge, could the race be arranged by your paper?

I am willing to go to Wisbech and run him there, provided he agrees to pay my expenses should I win. If he cares to come to Scotland, I agree to pay his expenses should he beat me.

I would also suggest that Mr. Ames correspond with you on the matter, as he seems to be so much buoyed up with the capabilities of his machine. However, I trust he will accept or withdraw the challenge. T. B. HILL.

A TABLOID HISTORY OF AIR-COOLING.

Sir,—Sergt. "G.C." does not seem to appreciate that low type of humour which is based on gross exaggeration, from which I deduce that he is Scottish rather than American. I beg to explain with apologies that I merely meant that special and rather wasteful measures are required to supply the cylinders of a rotary engine with a charge of mixture. If he desires to question this statement, as thus re-phrased, perhaps he will meditate on the peculiar construction of the Bloc tube carburetter and compare the relative consumptions of rotary, radial, V, and vertical engines of the same effective horse-power: he will find the rotary at the bottom of the list every time.

I never said that a 50 h.p. or 80 h.p. Gnome threw out two gallons of oil an hour.

I am well aware that some enthusiasts expect great things of various secret rotaries of novel construction, now that the conventional types are obsolete or obsolescent. I am

willing to be convinced: but I don't quite see how an engine which wastes 10% of its output in windage can be more efficient than one which reserves its power for the job in hand; nor how an engine which is subjected to centrifugal stresses can weigh less than a very similar engine which is devoid of such stresses. Perhaps I may have to eat my prophecy when I see some of these novel rotaries.

ROAD RIDER.

SPARE PARTS FOR OLD MODELS.

Sir,—I and, I think, others would like to know what the manufacturers, who are entirely discarding their previous designs, are going to do for the man who has listened to their previous blandishments and bought machines.

A.B.C. Motors are a glaring example of such unfeeling treatment, and yet they expect the buying public to rush for the revolutionary product of Mr. Bradshaw's brain. Although I have no doubt that the new creation will live up to the old A.B.C. reputation, it seems to me that the 1914-1915 model was all that could be desired. I speak from personal experience. Perhaps, next year, Mr. Bradshaw will have another "brain wave," and where will the purchasers of the 1919 model be then, "poor things," if the company concentrate on the latest model only?

I am aware that there are not many A.B.C.'s of the 1914-1915 model about, but those who have owned them, I am sure, are highly satisfied, and it is up to the makers to see that they may have replacements if wanted.

Some of these machines have been laid up during the war, their owners waiting for the time when they may be able to obtain that little spare they wanted, and now, after keeping up their spirits with, no doubt, quite truthful advertisements of the machine and engine, the makers suddenly "put the wind up" the long-suffering owner, by announcing an entirely new model altogether. J.

Newcastle-on-Tyne.

We submitted this letter to Mr. Granville Bradshaw, who replies as follows:

Sir,—Your correspondent is wrong in surmising (in the case of the A.B.C. motor cycle at any rate) that because we have taken full advantage of the knowledge gained by experience in this war, and redesigned our motor cycle, we have not made provision for keeping an adequate supply of spares and doing repairs to the pre-war A.B.C. machines.

What we have done is to place the manufacture of the new model in a factory excellently equipped and arranged for concentration upon this one model entirely, in order to give the highest service of the best article to the motor cycling public at the most reasonable price, and this has left us with considerable facilities for repairing and overhauling pre-war A.B.C. machines in our own shops.

We have a considerable number of pre-war machines being overhauled and tuned up at the present moment by our own skilled mechanics, and although we naturally cannot supply every spare from stock, we have quite a large number of spares, and are prepared to supply at short notice any part of which we do not happen to have a stock.

Your correspondent suggests that the 1914-15 model, from his own personal experience, was all that could be desired, and we are very pleased indeed to hear this; but, at the same time, we do not think that the motor cycling public should lose the benefit of later experience we have gained, particularly when this does not in any way affect the delivery of spares for our earlier models.

A.B.C. MOTORS, LTD.,

Granville Bradshaw, Engineer and Manager.

IS A CONTRACT BINDING?

Sir,—If your correspondent, "A Scrap of Paper," had consulted a solicitor, he would, I think, have advised him to bring an action for breach of contract. He has been bluffed out of his rights.
H.L.L.

HUB GEARS.

Sir,—Having read several articles and letters in *The Motor Cycle* derogatory to hub gears, I should like to say that I have found them to be absolutely satisfactory in every way. Having had three machines fitted with Sturmey-Archer hubs and all-belt drive, I never wish to have anything different. The only attention I found necessary was adjusting occasionally, oiling daily, and swilling out with paraffin at long intervals. None of the machines was used for "fair-weather" work only, but continually on bad roads and in all weathers. I made a clean ascent of the Wrekin in the winter of 1913-14 on a single-cylinder fitted with a three-speed hub without the slightest slipping or trouble with the gear.

I add the usual disclaimer.
Shrewsbury.

EX-D.R.

TO KEEP THE HANDS WARM.

Sir,—If your contributor Miss E. M. Gardener will wear under her mitts a pair of loosely knitted gloves, made of camel hair or natural alpaca, or a mixture of the two, brushed well outside and turned and worn inside out, she will find them to keep her hands as warm as she can reasonably expect. For technical reasons, it is usual to find it easier to achieve a really good "brush" on the right side of the glove than on the wrong side; hence the suggestion to turn it and wear wrong side out under the mitt.

Gloves such as I suggest have been made in Leicester in quantities recently, as the wools concerned have been "free of certificate," and in consequence have been very much used. The gloves should be kept very dry, as brushing holds the moisture.

Leicester.

COMFORT.

THE CONTROL OF AEROPLANE ENGINES.

Sir,—May I reply to a letter from Mr. R. A. Butt in *The Motor Cycle* published on February 20th? I should like Mr. Butt to be a little more concise and say to what engine he refers.

In his second paragraph he states that it is only in low-pressure gauges that he has ever noticed the pressure to be excessive. May I ask on what engine he has found this? He states that most engines have just the high-pressure gauge, and that it gradually builds up to its correct pressure. This, he will find, is in nearly every case exactly what it does not do. Why are overload gauges fitted, and also why do they fit gauges which read up to, in some cases, 400 lb. per sq. in., when the normal pressure eventually settles down to 40-60 lb. per sq. in., and in some cases less?

It is common knowledge that oil, when cold, is viscous. The majority of oil pumps fitted in aero engines are gear pumps, and very efficient, so that as soon as the engine starts up the pump delivers considerably more oil than the engine requires, hence the necessity of a relief valve. The relief valve and pipe leading back to either the sump or the tank cannot pass the excess of oil owing to its viscosity and skin friction, so consequently an excessive pressure is registered on the gauge. This happens on at least three well-known makes of stationary engines, not once, but every time, unless the oil is made very hot before being put in the tank, which is very often done.

I have both seen and heard of engines being stopped after perhaps seven minutes' running in order that the oil may warm up, but I admit there is not very much gained.

Mr. R. A. Butt cannot have had experience of machines built for long flights, which carry, say, twelve gallons of oil: as in the event of all this oil being in circulation, a rough estimate in cold weather is to allow from one and a half to two minutes for each gallon of oil in the tank to attain anywhere near its correct temperature.

I should be interested, if R.A.B. replies to this, if he would state what he considers the correct temperature C. for oil to be before getting off. I am fully aware that a number of pilots do consider that as soon as the water is warm it is good enough to get off. This is entirely wrong, and should be pondered over for a moment thus: what is happening inside the engine with the temperature low? The oil is being thrown about in—shall we say—lumps, instead of being sufficiently warm to form a spray.

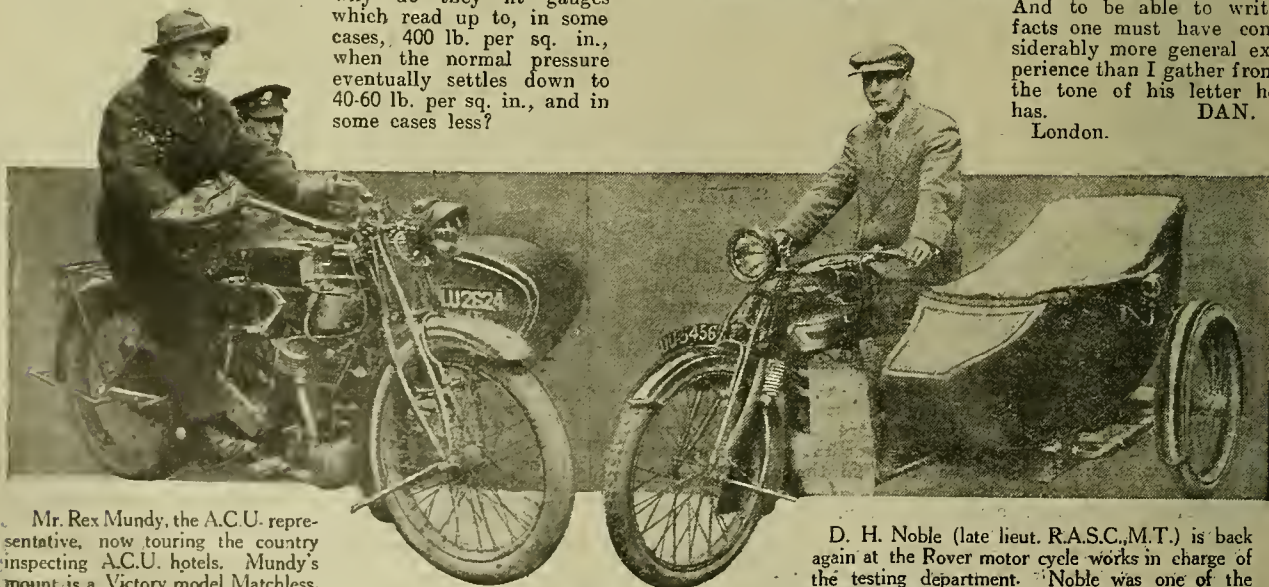
R.A.B. states that almost every engine has its own set of revs. This to a point is true, but the revs vary very little indeed. The maker has to turn out an engine giving so much h.p., which is duly checked by officials, and there is very little variation in the h.p. on the brake tests; the variation may be more often due to the variation of the propellers.

R.A.B. states he has never heard of an engine being run up and down on each separate ignition system. May I take an engine with two plugs per cylinder, necessitating either two magnetos or one magneto and one battery ignition? If the engine is so fitted it is obviously with a purpose, which, let us say, is to make it more reliable, to say nothing of a little extra power. Unless the two systems are tried, for all R.A.B. may know he is only getting one spark doing any trade. If he is out for a long flight, surely he would rather have the satisfaction of knowing that if one plug goes out he has a chance with the other. Any good man who runs an engine will see that he gets very nearly the same number of revs on each ignition. Then why have two ignitions?

I must apologise for such a lengthy letter, but R.A.B.'s letter is one which could be picked entirely to pieces. May I respectfully suggest that he get facts and then write them?

And to be able to write facts one must have considerably more general experience than I gather from the tone of his letter he has.
DAN.

London.



Mr. Rex Mundy, the A.C.U. representative, now touring the country inspecting A.C.U. hotels. Mundy's mount is a Victory model Matchless.

D. H. Noble (late lieut. R.A.S.C., M.T.) is back again at the Rover motor cycle works in charge of the testing department. Noble was one of the Rover competition team.

HUN APPRECIATION OF BRITISH GOODS.

Sir,—On page 157 of your issue of the 13th inst. you give an instance of a despatch rider taking from a Boche aeroplane and fitting it to his own machine a plug which subsequently turned out to be of a well-known English make. We should like to say that the Boche's appreciation and adaptation of British fittings of aeroplanes were by no means confined to plugs, excellent as they are, for we had many instances during the progress of the war of bringing down and capturing German aeroplanes fitted with Palmer landing wheels and tyres. THE PALMER TYRE, LTD.

THE NEW A.B.C.

Sir,—On opening the paper on Thursday morning the first thing that attracted my attention was the illustration of the A.B.C. motor cycle, and I must confess I was a wee bit disappointed, as I, like many others, was looking forward to a much neater, more accessible, and simpler machine.

As "Ixion" remarks in the same week's issue, "Why cannot we have a 'power unit' without bolts, flanges, and rods projecting out here, there, and everywhere, besides all the awkward corners, making it absolutely a bugbear of a thing to keep clean?"

How Mr. Bradshaw intends the cylinders, rockers, tappets, valves, etc., to keep clean and cool I cannot imagine, unless he has designed a screen or something to keep the mud off and the air on. Which, in my experience, has been practically impossible.

You say that, though the tappets, etc., may appear to be on the light side, yet they are bushed. Surely this is to be expected on an up-to-date motor cycle, and I only hope that facilities are given for lubricating these small points in an efficient manner, otherwise they will soon wear and rattle.

I think the springing excellent, and a move in the right direction, owing to its simplicity and freedom from wearing shackle pins, etc. There does not seem to be any provision made to overcome the changing length (due to springing) between the chain wheel centres on account of the chain stays not pivoting on the centre of the driving sprocket.

You mention that the timing has a train of five wheels; also, there is a four-speed gear box and bevel and chain drive, all taking a percentage of power. This does not seem to me to be the most efficient way of utilising the power given off by the cylinders to propel the machine. The gear box may give direct drive to top speed, but not in the sense it does on other machines, as it really gives direct drive to the bevel only, then through the semi-protected chain to the back wheel.

I believe there has been, in another journal, some correspondence on the gyroscopic action of the flywheel. All I can say is, if Mr. Bradshaw will ride a four-cylinder F.N., geared six to one, at forty-five miles an hour, and try to lean over to take a curve on the road, he will find the machine refuse to lean, and if he cannot lean he cannot get round the curve, unless he slides round. I myself have experience of this.

In conclusion, I think Mr. Bradshaw is to be complimented on the unique and very clever design of the A.B.C., and I wish it success in spite of my criticism.

H. WALKER.

Sir,—I have read with great interest the accounts of the new A.B.C., and while the greater number of points please me very much, I should like to offer one or two suggestions for the improvement of the less important details.

(1.) Why should the front brake not be placed on the left of the wheel, thus allowing the speedometer drive its usual place on the right? (By the way, the present time seems opportune for the adoption of "Ixion's" oft-repeated suggestion that the drive should be screwed on to the hub and locked into place, instead of the troublesome method now used of attaching it to the spokes.)

(2.) The mudguards seem unduly narrow: valances close to the wheels are a great nuisance in snow and certain kinds of mud.

(3.) The splash guard is not high enough for winter riding; detachable pieces might easily be added.

(4.) An oil spray directed on to the chain is bad in practice, unless the chain is completely enclosed, because the oil forms with the road dust a very effective grinding paste,

which quickly wears both chain and sprockets. I have experienced this; a periodical soaking in a special chain lubricant is far better, and I should even prefer a dry chain.

(5.) Why not lubricate the fork links by drilling the steel pins and fitting a grease cap on the end of each?

I hope that Mr. Bradshaw will take these suggestions in the spirit in which they are offered, and make his machine as near perfection as possible. JOHN HOLLAND.

ALUMINIUM COOLING.

Sir,—In spite of the very modest and courteous letter of Mr. Ayton (March 6th), to whom, apparently, I have had the privilege of affording half-an-hour's amusement, I still adhere to my previous letter (February 13th).

I do not intend to enter into any further correspondence on this subject at the present moment, but in a few months' time Mr. Ayton may discover that the monopoly of intelligence is not confined to the charmed circle of his acquaintances. EDGAR RUSSELL.

THE HORSE-POWER OF MOTOR CYCLES.

Sir,—I notice that in *The Motor Cycle* for March 13th you suggest rating machines strictly according to capacity. You state that a motor cycle "in good tune" should give 1 h.p. for every 100 c.c. While admitting this, would it not be better to rate it as nearly as possible to what may be expected even in poor or average tune, which appears to be what the present manufacturer does? A nearer rating, to my mind, would be 1 h.p. for every 140 c.c.

Make.	Capacity. c.c.	Makers' rating. h.p.	Suggested rating. h.p.
Rudge ...	499 ...	3.5 ...	3.56
Triumph ...	550 ...	4.0 ...	3.95
Douglas ...	350 ...	2.75 ...	2.5
A.B.C. ...	398 ...	3.0 ...	2.84
Enfield ...	770 ...	5.6 ...	5.5
Indian ...	1,000 ...	7.9 ...	7.12

I think this should be sufficient proof that to allow 140 c.c. is preferable to allowing only 100. The public have got used to rating a 500 c.c. machine at 3½ h.p. and will expect that capacity for the power mentioned.

We all know that it is possible to get about 10 h.p. out of a 500 c.c. engine with special tuning. What the average purchaser wants to know is the power he may be certain of getting with his detuning. ROBERT B. BREEZE.

Sir,—We were highly interested to read your leading article on the above subject in *The Motor Cycle* of March 13th. This question of the h.p. of an engine is one which has "worried" us for some years, and in one of our catalogues we mention, in describing our engines, that we prefer to give, always, the cubic capacity, that riders could form their own opinion, by comparing, as to the h.p. We think it is highly desirable that some definite rule should be recognised by the trade. We style our single-cylinder engine, 499 c.c., as 3½ h.p.; the single-cylinder, 597 c.c., as 4½ h.p.; and the twin, 842 c.c., as 6 h.p.

We hope something may be decided as the outcome of your article, as soon we shall be printing a 1919 list, and we propose describing our twin engine, which will be 864 c.c., as 6.7 h.p.

It would, naturally, be a great advantage for the public if manufacturers could describe the h.p. of their engines on some acknowledged formula.

THE LLOYD MOTOR ENGINEERING CO., LTD.,

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The recognised standard text book of the motor cycle; deals with all types of machines and with every part of the machine. 400 illustrations. Price 2/6 net. By post, 2/10.

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or of leading Booksellers and Railway Bookstalls.

QUESTIONS AND REPLIES

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C.4, and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

Preserving Plating.

? (1.) In order to make all bright parts on my motor cycle rust-proof I was thinking of giving them a thick coat of ordinary varnish, do you think this would be a success? (2.) Is 65 m.p.g. a good consumption for a 1917 $3\frac{1}{2}$ h.p., with passenger?—F.G.

(1.) There are several special varnishes and transparent enamels sold for this purpose, but they are somewhat difficult to apply. When applied the varnish is quite invisible, and it is impossible to see if all parts are properly covered. After the job has been completed and the article has been left to stand for a day or two, any parts not covered immediately tarnish and show up. After a little time the varnish is inclined to turn yellow, and the appearance is not good; while to remove the varnish by means of methylated spirit is a tedious and difficult matter. Oil and vaseline are also effective, but they collect the dust and are unpleasant to touch. (2.) This is not a very good consumption; on the other hand, it cannot be said to be excessive, considering the quality of present-day "spirit."

Irregular Firing.

? I am riding a 5-6 h.p. 1915 model Indian. The engine has been running beautifully up to a day or so ago. Whilst on a nice stretch of road I opened the engine up and then I throttled down for a corner, but when I attempted to open the throttle again it would only fire on one cylinder. If I retarded the spark it would fire on both. I took out the carbon brushes which were gummed up badly, and put new ones in, but this does not make any difference. The timing is all right, and if I put the plugs on the outside of the cylinders I get a good spark in both with the ignition fully advanced. Sometimes I may get them both to fire, but only three or four times in, say, two hundred yards. The carburetter is quite in order.—G.H.

Probably the trouble is due to a defective magneto contact breaker. Perhaps one of the cams is worn, or for some reason the contact breaker points are not making good contact. You should get someone to rotate the engine while you watch the behaviour of the contact breaker. It is also possible that the plug may be defective. Plugs which will spark on the exterior of the cylinder sometimes fail to spark under compression.

A Changed Tube.

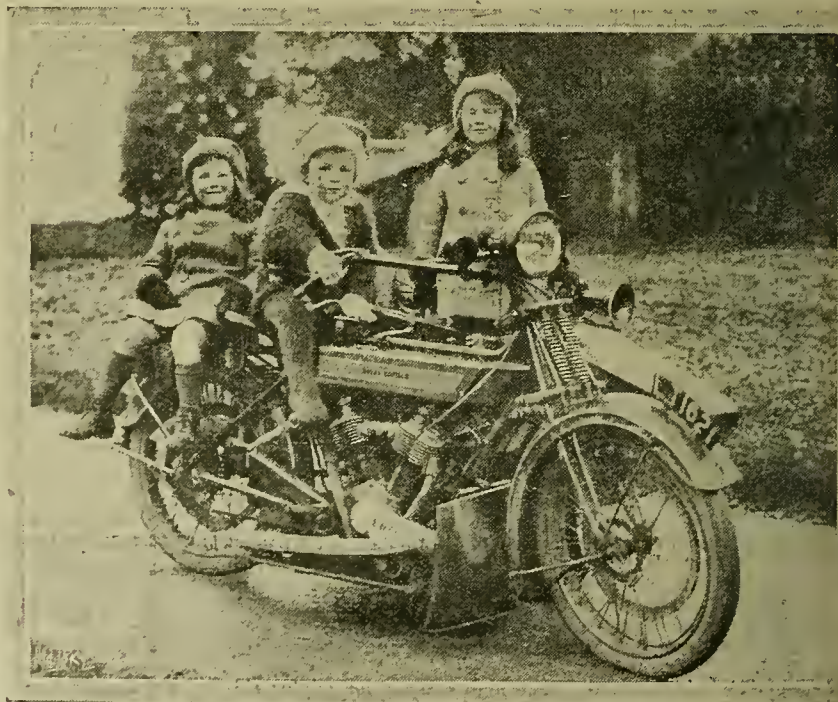
? On March 3rd I left my cycle in a repairing shop for a new lever to be fitted. On the following Sunday, about eight miles from home the front inner tube burst suddenly, throwing me off. To save myself I had to let the cycle go, causing one pedal to snap off, and a little damage to myself. When I recovered, I pulled the tube out, and found that my own tube, which was practically new, had been exchanged for an old one, which caused the damage. Can I institute proceedings against the man for fraud, and claim damages?—WALES.

Judging from what you say, we are of opinion that you could institute either criminal or civil proceedings. From your point of view the latter would be better, as it would be more satisfactory to obtain damages than to get the man punished. We presume that you are in a position to prove your statements? If so we advise you to employ a local solicitor.

Magnets.

? Why are magneto magnets not made in compound form? That is, instead of each magnet being a single bar of steel, why is it not composed of, say, six thin strips of steel, separately magnetised and fixed together, making a much more powerful magnet than a single bar? Where can thin strips of tungsten steel be obtained?—A.J.W.

There is no reason why magnets for magnetos should not be made as you describe; it is a question of the manufacturing cost compared with the result achieved. The principle is carried out to some extent, as you are no doubt aware, in certain magnetos in which double or triple magnets are used to obtain extra magnetic strength. Presumably it is found that it does not pay to take the principle further than this, and, therefore, it is not adopted commercially. For thin strips of tungsten steel, write to Messrs. W. H. Jubb, Ltd., 12, Brittain Street, Sheffield.



A CHARMING GROUP OF POTENTIAL SIDECARISTS.

The fascination the motor cycle has for children is most marked. In this instance it is the children of Lord and Lady Decies who have taken possession of an Enfield outfit.

Difficult Starting.

Q

I have a 3 h.p. two-stroke Murphy. I have tried to start it on the road; I can push it along while I have the release open, but as soon as I drop it I cannot get the engine over compression. Please tell me what to do, as I am a novice.—W.J.H.

You do not say whether the machine is fitted with a fixed or variable ignition. If the latter, advance the spark about halfway when you are intending to start, or perhaps just beyond this point, inject petrol through the release valve, and push at a good speed, when the compression should be overcome without much difficulty.

A Two-stroke Query.

Q

Will you please oblige me by answering the following questions regarding two-stroke engines: In the downward stroke there is compression in the crank case, the carburetter being fixed to the transfer port. Is there a valve to stop the pressure getting to the carburetter? If so, where is this placed, and how does the engine get its gas; or, if not, how is it that there is not a blow back through the carburetter?—Sgt.-Obsr.

There is no blow back through the carburetter because the inlet port is closed. The carburetter is not fixed on the transfer port but on the other side. See the illustrations in "Motor Cycles and How to Manage Them," latest edition, pages 56 and 57.

Four-stroking

Q

I have a 2½ h.p. two-stroke motor bicycle three years old, and have never yet been able to get it to two-stroke under 20 m.p.h., and even then along the flat it will start four or eight-stroking up to 25 m.p.h. If I give it a bit of collar work it pulls well, but down the slightest incline the engine fires irregularly. I have altered the firing point from dead top to a lead of ¼ in., but find ¼ in. the best spot, although the makers actually recommend the spark to occur at the top of the stroke, but this position causes loss of power and just as bad four-stroking effects. The plug points have been tried at all gaps within reason. The compression is good, and there are no air leaks; in fact, I have tried everything I can think of without effect. I often wonder whether the port design is inferior, or whether a different two-stroke carburetter would be any use. The makers recommend a 28-29 jet, but anything above 27 causes more four-stroking. Nothing is sweeter than a two-stroke firing correctly, and the power and hanging on is fine, but eight-stroking on greasy roads and dark nights is miserable, as you know. I cannot get a good spark outside the cylinder by turning the magneto over by hand, but cannot think it is weak, as it fires so well and regularly on hills.—E.S.R.

The question of four-stroking is a difficult one. It occurs apparently in nearly all two-strokes under exactly the same conditions as those described in your letter. The exact cause is not apparent, and in most cases it appears to be incurable, but the fitting of a smaller jet than that

recommended by the makers after the machine has been in use for some time is often beneficial. We do not think for a moment that your magneto is weak, and the reason why you do not get a strong spark when rotating the engine is probably due to the fact that the magneto is not revolving fast enough.

Unequal Sparking.

Q

Will you please tell me the reason of and remedy for the following: I have an 8 h.p. Matchless combination fitted with a U.H. magneto. I have had the magneto down recently, and on trying to start up I found this: With the spark lever retarded I got a good spark on one cylinder and a weak one on the other; then if I advanced the lever fully I got a good spark where the weak one was and vice versa.—T.H.S.

The reason is that, owing to the cylinder angle, the spark occurs nearer the maximum position in one cylinder than in the other. As you advance the spark you change these positions over. As the speed of the engine increases when once it has started to fire you get an equally good spark in each cylinder, so the difficulty, which is inherent in the case of practically all old V type magnetos, only occurs at starting and at very slow speeds.

IMPORTANT NOTICE.

GOODS MADE IN GERMANY.

The proprietors of this journal, being fully in accord with the recommendation agreed upon at the Paris Economic Conference, give notice that they will not permit the advertisements of new goods manufactured in enemy countries to appear in this publication.

ILIFFE & SONS LTD.

Difficult Starting.

Q

I possess a 1915 Royal Enfield motor cycle combination. I am wondering if you can give me a little advice as to starting the engine. The outfit is too heavy to push and jump on, and unless I can start with the handle the whole thing is practically useless to me. I have found the machine will start all right after being pushed down a hill a few yards, but it is only once in a while that the engine can be started with the handle. There are times when the handle will start the engine when it is hot, and occasionally when dead cold. I have done the usual in the way of flooding the carburetter, placing the magneto in all manner of positions, also injected petrol, but even then the handle fails to start the engine. Can you suggest anything I can do to rectify matters?—H.T.O.

Try injecting a little petrol, but not too much, and also try placing a rag in the fixed air inlet of the carburetter while turning the handle, removing this the instant the engine fires. Difficult starting is nearly always due to air leaks at the carburetter or induction pipe unions. Of course, war time petrol probably aggravates the trouble.

READER'S REPLY.

A Slipping Low Gear.

In your issue of March 6th there is a letter from a rider who cannot get up hills on the low Roc gear of his 3½ h.p. Humber. Devon is far from level, as many of your readers know, and I had similar trouble, until by leaning over I discovered that the low gear drum was slipping. It was evident to the eye that the drum and the rear wheel were not revolving together. It was also evident that I failed on hills, not for want of engine power or a sufficiently low gear, but because my engine power was wasted in useless friction. Should your querist desire proof, I suggest that he tackle a stiff hill, and at the top feel if the low gear drum is not distinctly warm. After making sure the frictional surfaces of the drum and band were in good order, I removed the lever at the end of the low gear band shaft, and replaced it with one twice as long. This proved an efficient remedy. The adjustment of these gears is rather a tricky matter, a little carelessness permitting the gear that is not in use to be a drag on the other. The point to be aimed at being to have both gears holding firmly and the back wheel to be free when neither is engaged.—W. H. TINNEY.

RECOMMENDED ROUTES.

MALTBY TO RHUDDLAN.—H.S.

Maltby, Chesterfield, Bakewell, Buxton, Macclesfield, Knutsford, Northwich, Chester, Hawarden, Holywell, Rhuddlan.

SOUTHAMPTON TO SWINDON.—S.G.P.

Sonhampton, Winchester, Andover, Ludgershall, Collingbourne Ducis, Marlborough, Swindon. Approximately 63 miles.

WARRINGTON TO BRADFORD.—F.C.P.A.

Warrington, Glazebury, Atherton, Bolton, Bury, Rochdale, Sowerby Bridge, Halifax, Bradford. Approximately 56 miles.

WOLVERHAMPTON TO AYLESBURY, VIA WALSALL AND BIRMINGHAM.—D.S.H.

Wolverhampton, Walsall, Birmingham, Solihull, Wroxall, Warwick, Banbury, Aynho, Bicester, Aylesbury.

COVENTRY TO CHELMSFORD.—H.S.

Coventry, Daventry, Weedon, Towcester, Dunstable, Luton, Hertford, Epping, Chipping Ongar, Chelmsford.

BLACKBURN TO DARTFORD.—F.N.

Blackburn, Bolton, Manchester, Cheadle, Wilmslow, Congleton, Newcastle-under-Lyme, Stone, Stafford, Rugeley, Lichfield, Tamworth, Over Whitacre, Coventry, Rugby, Crick, Northampton, Newport Pagnell, Woburn, Hockliffe, Dunstable, Redbourn, St. Albans, Barnet, at Tally Ho Corner take the left-hand fork, and go by Archway Road, through Holloway, along Holloway Road, New North Road, Moorgate Street, The Bank, then via King William Street to London Bridge, cross London Bridge, along Great Dover Street, Old Kent Road, New Cross Road, Shooters Hill Road, Shooters Hill, Crayford, Dartford.

N.U.T. Appointment.

Mr. Geo. King, the well-known clubman, is now sales manager for the N.U.T. Co.

Lightweights in Russia.

It is, perhaps, not generally known that a large number of lightweight motor cycles were ordered by the Russian Government. Over 200 O.K. machines were sent out and, we understand, gave satisfactory service.

No Matchless Racing Machines.

Messrs. Collier and Sons, a correspondent was informed, are not making any machine for racing or record-breaking purposes this year. Their last aeroplane engine contract is completed, and the large department for the overhaul and repair of machines of their make is in full swing.

Ariel Officials at Suvla Bay.

Captain J. L. Stocks, R.A.F. (son of Mr. J. W. Stocks, general manager of Ariel Works, Ltd.), has just received his discharge and commenced his duties as travelling representative in the Midland counties for Ariel manufactures. He first joined the Armoured Car Division in 1914, and was present with his father at the Suvla Bay landing (Gallipoli), in August, 1915. He then joined the R.N.A.S., obtained his pilot certificate, was transferred to the R.A.F., and has been doing useful work on sea patrol. He gained his captaincy in July last year.

Catalogues Received.

A new B.S.A. catalogue is to hand, and, as usual, is very full of detailed descriptions of the well-known machine. The illustrations of the models are in colour. The catalogue is not dated.

"Royal Enfield Motor Cycles" (the Enfield Cycle Co., Ltd., Redditch): An extremely well got up catalogue, illustrated by tinted illustrations of the latest model Royal Enfields. The catalogue includes the 2½ h.p. two-stroke, the 3 h.p. twin with overhead valves and mechanical lubrication, and the well-known 6 h.p. and 8 h.p. sidecar combinations.

We are in receipt of Messrs. Jenks's latest list, which is quite an interesting publication. This describes tools of all kinds—adjustable spanners, box spanners, various types of pliers, set spanners, screwdrivers of no fewer than seven different kinds, oilcans, hammers, mallets, punches, tyre levers, and washers. All tools marketed by Messrs. Jenks Bros. are guaranteed to be of British manufacture.

We are in receipt of the magneto catalogue issued by the British Lighting and Ignition Co., Ltd., 204, Tottenham Court Road, London, W.C.2, makers of the B.L.I.C. magneto, and which is owned by Vickers, Ltd. The object of the catalogue is to furnish engine designers with a description of the company's latest magnetos, but in the future it is intended to issue separate pamphlets dealing in detail with each of the most important types. In the catalogue full instructions are given for those intending to order magnetos. A full range of motor cycle magnetos is listed.

SPARKLETS**The Endrick Co.**

Mr. H. S. Bilbe, A.M.I.A.E., who was one of the first we recruited for the Motor Machine Guns, has now been demobilised, and is restarting the Endrick Engineering Co., late of Olton, at Crawley, Sussex.

Stainless Steel.

An interesting booklet has been issued by the Firth-Brearley Stainless Steel Syndicate, Ltd., of Sheffield, which contains information and instructions to assist those who are interested in using stainless steel. The Firth-Brearley Syndicate is not a manufacturing company; the steel is obtainable from Thos. Firth and Sons, Ltd., Norfolk Works, Sheffield, and Brown Bayley's Steel Works, Sheffield.

Full Up.

Since the Armistice was signed and certain restrictions removed, a very large number of Triumph riders have availed themselves of the facilities offered by the Triumph Works for a general overhauling of their machines. As a consequence, they are now simply inundated with work in this direction, and, for the time being, are not in a position to accept any further motor cycles for general overhauling. The Triumph Co. naturally regret having to disappoint users, but riders will readily understand the many difficulties manufacturers have to face after being all out for so many years on war work.

War Service.

Messrs. Bowden Wire, Ltd., moved into their new factory in June, 1915, so as to cope with the demands of all the Allies for their goods. During the war the company were engaged in the manufacture of rifle grenades, fuses, etc., but the demand for Bowden wire became so great that the manufacture of this article gradually cut out that of other war specialities, and many million feet of Bowden wire have been consumed by Great Britain and her Allies.

N.S.W. (Australia) M.C.C.

THE inter-state trial organised by the N.S.W. Motor Cycle Club at Christmas, over the new overland route between Sydney and Melbourne, proved a great success. The results were as follow:

FIRST PRIZES (value £10 10s. each).

V. R. Blackett (3½ h.p. Zenith solo), no points lost.

A. Wright (7 h.p. Indian sc.), no points lost.

E. Tyler (7 h.p. Indian sc.), no points lost.

SECOND PRIZE (value £5 5s.).

L. Palmer (7 h.p. Indian), no points lost at controls; penalised through starting with sidecar and finishing solo.

THIRD PRIZES (value £3 3s. each).

II. Frost (7 h.p. Indian sc.), 60 points lost.

V. Flannagan (7 h.p. Harley sc.), 64 points lost.

FOURTH PRIZES (value £2 2s. each).

J. Treteway (6 h.p. J.A.P. sc.), 234 points lost.

E. Wiseman (7 h.p. Excelsior sc.), 393 points lost.

SPECIAL PRIZE (for machine finishing in best condition).

V. R. Blackett (3½ h.p. Zenith solo).



An animated scene at last week's well-attended meet of the Birmingham N.M.C.F.U. near Stonebridge.

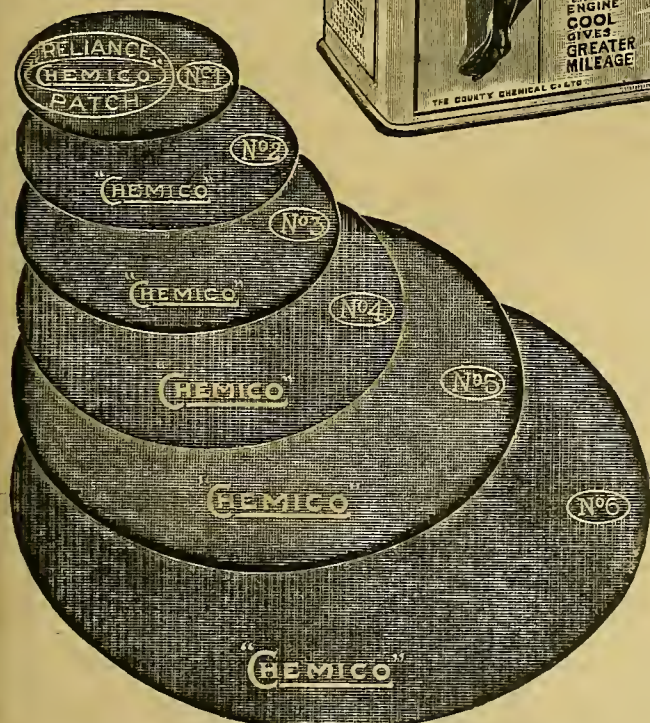
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The COUNTY CHEMICAL
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I ASK YOU TO READ THIS TESTIMONY.

COULD anything be more convincing. Mr. Edwards actually spends money to tell me how pleased he is, and Mr. Kendall spared his valuable time in writing me at length.

Mr. Fred Edwards, the well-known actor, after having a BINKS fitted to his Bradbury by Messrs. Chiltern, of Cambridge, wired me on reaching London this three word testimonial:

"GOD BLESS BINKS,"

the most unique testimonial ever given.

Mr. Kendall's testimony is more deliberate, and really important to you.

C. Binks, Esq., Eccles.

February 4th, 1918.

Dear Sir,—About two years ago I built, for my own use, a motor cycle composed of Chater Lea frame, A.J.S. pattern, 3-speed gears and kick-starter, and a 1913 7-9 Rex engine, which had had very little wear. The engine had, when I bought it, a carburetter which I tried on the machine when completed, and after tuning up, etc., only got 50 m.p.g. After that I was told to try a variable jet, which I did, and only got 25 m.p.g. after trying all positions of jet opening. A friend of mine who had a garage (in which, by the way, I built my motor cycle) lent me an and a, both of which gave me 50 m.p.g., and through all this I had set my mind on a Binks Carburetter, but my friend of the garage did not like them, and yet he had not tried them; however, I sent my first to Booth's, of Halifax, and got a Binks in exchange (so much to boot). I might say in passing, I have a Gloria sidecar. Myself weighing 14 stone and wife 15 stone, and a heavy machine, and the engine would not run below 18 m.p.h. on any of the carburetters.

The first run on the Binks with self and wife and boy 14 years, we did 70 miles, and we can now do (in summer) 108 m.p.g., and not only that, I have convinced my friend of the garage and others to such an extent that through my order about eight others have fitted BINKS, and are delighted with them, and I feel convinced that the Binks Carburetter is a mechanical job, and as a petrol saver it is the thing.

I have used all kinds of so-called spirit, and have not yet had a choked jet, but have taken out any amount of fluff from under the spring at bottom of filter.

The only improvement I can think of is a better washer on cap under jet orifice, and a grub screw to keep air slide from dropping off, which it has done with me about four times, and slightly less control covers and discs to same.

A. the time of building the machine I was residing in Hull.

Yours truly (Signed), W. H. KENDALL.
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MR. O'DONOVAN'S
STARTLING
RECORD BREAK-
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ANCES on Brooklands
were all accomplished
by aid of a Binks.

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ECCLES,
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Makes the SCOTT machine run
dead slow like a steam engine.
Special models for SCOTT
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and all twins.

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Price 49/- Plus 50%
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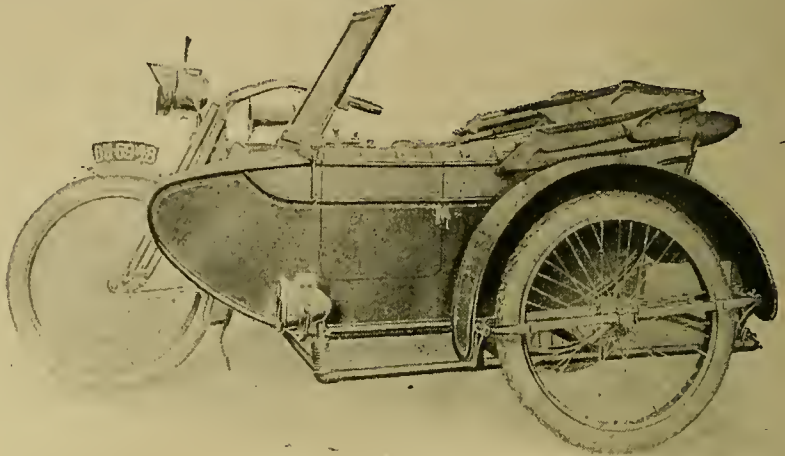
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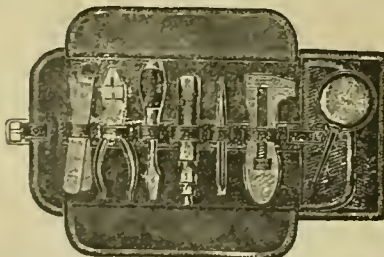
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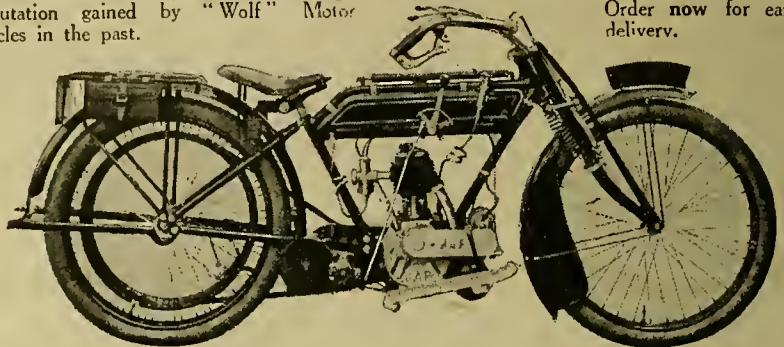
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2-Speed Gear, with Clutch and Kick-starter.
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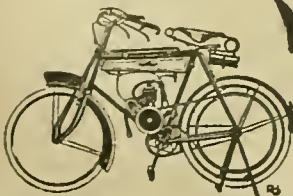
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has 12 YEARS road work to its credit. Advance leaflets of new model will soon be ready and deliveries commence about May. Send for particulars, and place your order early for this wonderful little machine which has given pleasure to hundreds.



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QUICKLY IF YOU USE "SPOTS"**

SPOTS increase Mileage by 25% SPOTS prevent carbon
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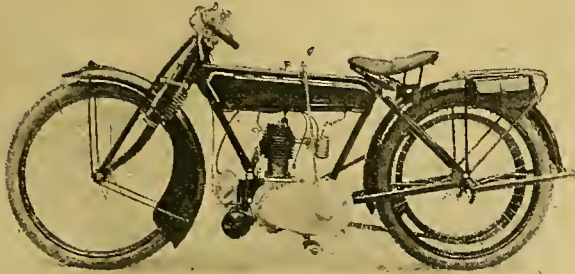
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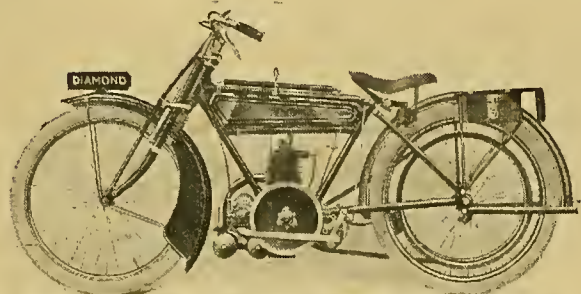
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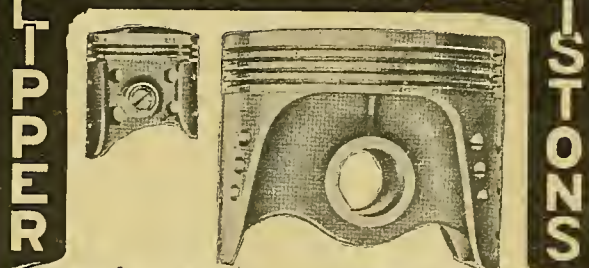
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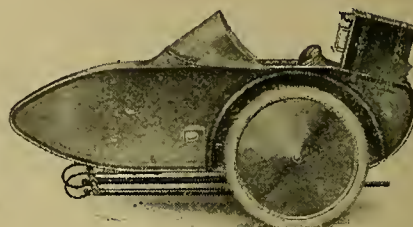
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THIS handy little volume deals with all the faults to which motor cycles are liable, explains how they can be easily diagnosed, and shows how they can be rectified. Every conceivable cause of trouble is dealt with, and the remedy for it carefully explained.

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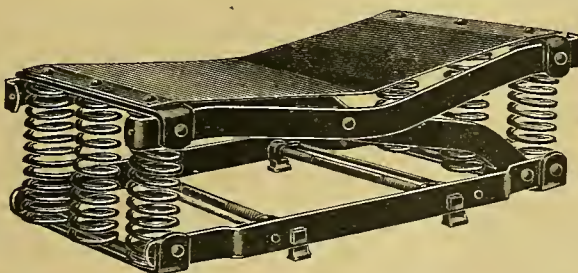
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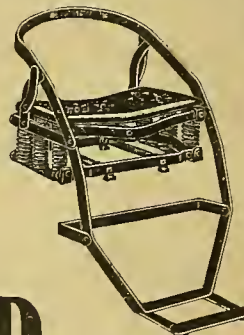
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THE VELOCETTE 2½ h.p. TWO-STROKE holds the record for lowest petrol consumption—229 miles per gallon. It is fitted with a highly-successful AUTOMATIC LUBRICATION SYSTEM.

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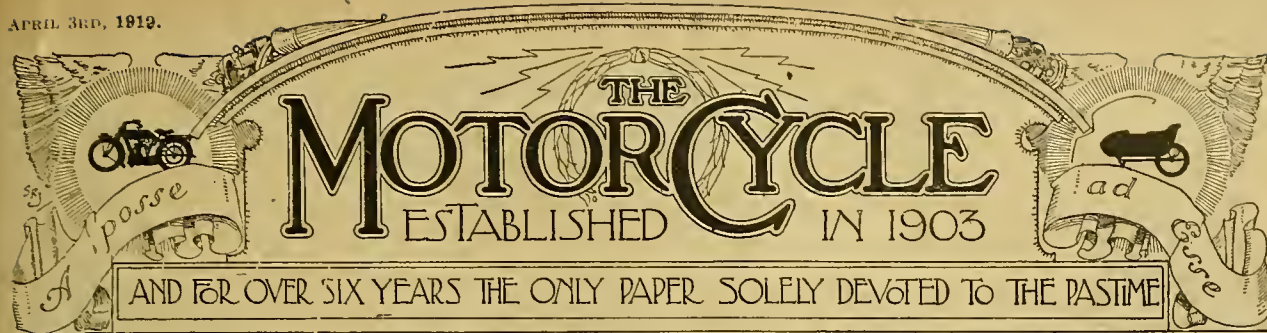
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AUSTRALIA—Gordon & Gotch, Ltd., Melbourne (Victoria), Sydney (N.S.W.), Brisbane (Queensland), Adelaide (S.A.), Perth (W.A.), and Launceston (Tasmania).**NEW ZEALAND**—Gordon & Gotch, Ltd., Wellington, Auckland, Christchurch, and Dunedin. **INDIA**—A. H. Wheeler & Co., Bombay, Allahabad, and Calcutta.**SOUTH AFRICA**—Central News Agency, Ltd.**PARIS**—Smith's English Library, 24 Rue Rivoli.**The Spring of 1919.**

NOT since 1914 has spring brought with it so much promise of activity in the motor cycle world. After the repression of years of war, enthusiasm for the pastime seems likely to burst forth with renewed vigour. Spring this year means more than it has ever done; it will be a reunion of many motor cyclists who have lost touch with each other since 1914, and who have been scattered all over the world in the service of the nation. Moreover, every meeting of motor cyclists has an unusual interest this year, when so much novelty is expected in the new models. Truly, the winter of war is past and the voice of the hooter heard once more in the land.

Single-cylinder Balance.

HITHERTO it has been recognised as a fact—albeit a lamentable one—that the single-cylinder engine could not by any convenient means be balanced perfectly.

In the balancing of a motor cycle engine, we have to consider two separate sets of weights: the reciprocating parts and the revolving parts—not to mention such minor matters as the angularity of the connecting rod and the formation of a couple. It has long been known that a revolving weight can be balanced suitably by another revolving weight, hence it is easy to balance the crank pin, big end, and that part of the connecting rod, which is for convenience taken to be a revolving weight, by a weight, or weights, placed on the crankshaft or flywheels. Similarly, reciprocating masses can be simply and effectively balanced by other reciprocating masses acting in an opposite direction. This accounts for the almost perfect balance of a flat twin, even when no balance weights are added, for one piston balances the other, and so with regard to big end and connecting rod. There will, however, still remain an unbalanced couple unless means are taken to prevent this by placing

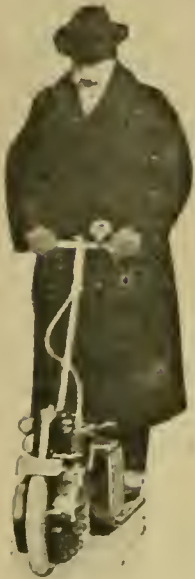
the cylinders truly in line, and using a double or forked connecting rod in one cylinder and a three-throw crankshaft. But the improvement in results hardly repays the added complication, when it is remembered that, given a suitable crankshaft and narrow big end bearings, such as can be used when roller bearings are employed, the cylinders can be placed a very little out of line.

In the case of a single-cylinder or V twin, the problem of the couple does not occur, and the primary balance has been the difficulty. Take, for example, a vertical single-cylindered engine. If the balance weights are made equal to the unbalanced revolving masses, the big end and crank pin will be adequately balanced, but the reciprocating parts will be entirely unbalanced, and much vertical vibration will take place. If the balance weights are made equal to the sum of the revolving and reciprocating parts to be balanced, the vertical vibration is largely removed—it cannot be entirely eliminated on account of the angularity of the connecting rod—but a considerable horizontal vibration will be set up. From the rider's point of view, this is less important, but it is customary to adopt a compromise, and make the balance weights equal to the revolving masses and half the reciprocating masses. This results in only a very moderate degree of balance.

We are now in a position to state, on the authority of a well-known automobile engineer, that a device has been invented by which a single-cylindered engine may be really well balanced. We are not at the moment permitted to reveal the method by which such a desirable end is achieved, but it is quite simple, and said to be entirely effective. Moreover, the names of those responsible for the device are a sufficient guarantee that it will do all that is claimed for it. It will be readily understood what this means to the single-cylinder, for it will result in its chief handicap, when compared with the flat twin, being removed.

SIR HENRY NORMAN AND HIS AUTO-PED.

Interview with Sir Henry and Major Low, who have designed an Improved "Motor Scooter."



Sir Henry Norman on the motor scooter, which received a great deal of publicity in the daily press quite recently.

As mentioned in the article "The Motor Scooter" appearing in last week's issue, the great interest taken in the motor scooter by the British public is largely due to Sir Henry Norman and Rear-Admiral Sir Reginald Hall.

Major Sir Henry Norman, Bart., F.R.G.S., A.I.E.E., M.P., is an old patron of motor-ing, is a member of the R.A.C. Committee, and of the Legislation Committee of the R.A.C. He is keenly interested in scientific subjects, and among the numerous important posts he has held was that of Liaison Officer of the Ministry of Munitions with the Ministry of Inventions in Paris—a most interesting appointment which brought him in touch with the numerous ingenious devices brought out by our French Allies. He has also

taken a lively interest in science and electricity generally and wireless in particular, and the first time we found his name connected with the motor cycle was when he had an Allon two-stroke fitted up by the High Tension Company as the source of power for producing current for a wireless installation during his investigations at the Front.

There is no doubt that Sir Henry is extremely enthusiastic over his motor scooter, and we are confident that an account of his views on this method of locomotion cannot fail to interest our readers. We therefore approached Sir Henry, and he readily accorded us an interview at his house in Westminster.

"How did you become acquainted with the Auto-ped, Sir Henry?" we asked.

"Lady Norman saw it in an American paper, and said, 'That is the very thing I have longed for all my life,'" replied Sir Henry.

"Did it take her long to get one?"

"Well, about six months, and when I had finally obtained it Lady Norman rode it in the first five minutes down the Portsmouth Road."

Here we may mention that the Hon. Lady Norman, C.B.E., has done magnificent work during the war, and at

the present moment is chairman of the Women's Committee of the Imperial War Museum.

"Does Lady Norman find it useful in her work?" we asked.

"Yes," replied Sir Henry. "She has given up the car altogether, and uses the scooter exclusively for getting about Town in connection with her work."

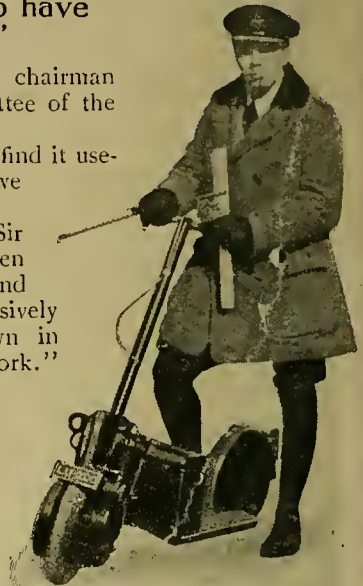
"What do you think of it as a mechanical contrivance?" was our next question.

"I think it is a very useful little vehicle," replied Sir Henry. "I may tell you that she has been bombarded by enquirers who addressed her in the street. So far as its mechanical design is

concerned, I called in my friend, Major Low, and together we took it to pieces, and found it to be hopelessly inaccessible and poorly made. I am confident, however, that a motor scooter, properly designed, has a big future, and I may tell you that Major Low and I have taken out several patents, and in a few weeks' time hope to have a sound design on the road."

Here we took leave of our genial host, who before

we departed showed us the Auto-ped's garage, a small coat cupboard near the front door, and had a few minutes' conversation on the subject of motor scooters with Major Low, whose name, of course, is well known to our readers. When asked his opinion on the standing question, Major Low replied: "Why stand? If you stand on a motor scooter you have complete control of it, and an absolutely perfect balance. If you sit down it is not nearly so easy to maintain the balance. Bearing in mind that the motor scooter is only used for short distances, I do not think the standing attitude is at all an objection. Mind you, the present design of motor scooter is hopelessly crude, and the particular pattern that Sir Henry Norman and I are bringing out will be a great improvement."



Major Low, R.A.F., the well-known scientist, who expresses his opinion of motor scooters on this page.

Sir Henry Norman, Bart., M.P., and Major Low, R.A.F., who are collaborating in the production of a motor scooter.





A Logical Decision.

FROM one standpoint it is rather a pity that the A.C.U. has disowned the four-wheeled cycle car.

Should such a vehicle ever make good, it will wage war on sidecar outfits and other three-wheelers, for if a firm in command of the requisite brains and capital ever takes up the cheap featherweight four-wheeler, it could certainly be turned out at a price which would cut the ground from under all existing four-wheelers. Even in 1914 the Baby Peugeot—an expensive design turned out in smallish quantities—was cheaper than many sidecar outfits. So the ideal would certainly have been for the four-wheeled cycle car to remain under the *ægis* of the A.C.U. But this ideal was shattered by the impossibility of drawing a line between the cycle car and the light car, just as the pundits have already failed to distinguish the light car from the car proper. The decision is mournful, but inevitable.

Wanted, Progress in Handle-bar Control.

Nobody seems to have noticed that handle-bar control is practically stagnant. We are still using the apparatus which was invented a dozen years ago, and which admittedly serves its original purposes fairly well, though it looks untidy and collects rust. During the last year or two we have seen the birth of automatic carburettors with a throttle lever arc of six inches or so, and gear changes which demand no more muscular exertion than a throttle opening. The former are controlled by levers which compel the rider to take his hand off the bar, thereby reducing the handle-bar control to much the same level of inefficiency as the old tank levers. The latter is operated by a side lever, subject to a similar defect. In many gear changes the location of the gear lever is of no particular importance, but a handle-bar change would be very pleasant, especially for the clumsier riders, under three sets of conditions, viz.: (1.) At speed. (2.) Over rough going of any kind. (3.) In thick traffic. It may perhaps be added that we are still waiting for a really sound handle-bar clutch control. All that can be said in favour of the best patterns is that they possess plenty of leverage. The span of the grip is always too wide to be comfortable, and if a hold-out trigger is fitted, it seldom remains reliable for long.

About Noise.

IT is rather absurd of some agitators to desire to silence motor cycles in the interests of the general public. We admittedly create a good deal of noise on occasions, but our machines are much less of a public nuisance than trains, trams, tubes, motor lorries, and motor 'buses. I have stayed at six separate hotels in London during the last year, and at none of them was it possible to sleep until one's body had grown accustomed to the uproar—incessant or intermittent—created by various forms of cheap public

transport. At my house in the suburbs low-flying aeroplanes awakened the household soon after sunrise on every calm, clear morning. The man who selects motor cycling noises as a high spot in the list of public grievances has no sense of fact or proportion. If making England "fit for heroes to live in" is to include the abolition of all noises, including suppressing the postman's knock, the milkman's yodel, setts and cobblestones, and performing a surgical operation on cats, motor cycles must plainly be silenced: but they play a very insignificant part in the noisy noise which accompanies our daily life.

Manufacturers and Silencers.

TO say that our machines are noisy because the average manufacturer is a poor engineer strikes me as ridiculous. I rode an almost perfectly silenced motor bicycle as long ago as 1904, and the public would not have it at any price. Personally I found it quite appreciably dangerous. A motor bicycle is too small to catch the tail of a pedestrian's eye: if we go in for efficient silencers, we shall be driven in our own and everybody else's interests to fit raucous alarms and to operate them incessantly—the remedy may be worse than the disease. There may be something—but not so very much—in the contention of *The Times* correspondent that riders like the open exhaust because the only alternative is valve clatter. But I am sure he is wrong in considering that the elimination of mechanical noises would create a yearning for a silencer with a note like the hiss of a snake, or even reconcile the average rider to such a silencer. For some wholly mysterious and possibly criminal reason, most of us like engine noise for its own sake, quite irrespective of the protection it affords or of the extra power it might offer as compared with a badly designed silencer. I fancy the reason is that noise is suggestive of power and also of the more sporting nuances of motor cycling—Brooklands, the T.T., etc.; but, whatever may be the reason, the fact remains.

The Debacle of the N.S.U.

CAN any Colonial reader tell me how and why the N.S.U. machines lost their supremacy in our Colonial markets? A few years ago every letter to hand from the Dominions lauded the N.S.U. machines, and derided the lop-eared way in which British makers competed with the Hun, just as to-day we hear panegyrics of the Indian, Harley-Davidson, etc., and frantic enquiries as to whether our own firms will ever wake up. I never much liked the N.S.U. machines myself: they looked tinny, and they lacked refinement; but they were undoubtedly reliable, and they were fitted with reliable two-speed gears long before the average British machine had thought about such a thing. Then quite suddenly they lost their Colonial popularity, and presently the Yanks came along and filled the breach.

THE MOTOR CYCLE

AS AN AID TO "OTHER PASTIMES"

WHAT boundless possibilities are opened up by the use of a motor cycle as an aid to one's favourite pastime! There is hardly a known form of recreation the enjoyment of which cannot be facilitated by its use. Shooting, fishing, golf, tennis, football, photography and sketching, to name only a few—the motor cycle has a place in each.

Of course, the motor cycle can be the means of transit to and from anything, be it a cricket match or a wedding, a boxing tournament or a "jazz" ball. It is with those pastimes into which the motor cycle enters with a more intimate relationship that I propose to deal. Touring may be called a pastime, and the motor cycle is *par excellence* the tourist's mount, but this form of recreation forms such a well-known part of motor cycling life that a passing reference is all sufficient.

Shooting.

It is in the pursuit of game that a motor cycle can assist to perhaps a greater degree than in any other sport.

A misty morning in early October and a day's shooting in prospect, the venue being a group of small covets lying in a secluded valley about ten



How the Motor Cycle scores over both the Motor Car and Pedal Cycle.

miles away. A couple of sidecar outfits, and stored away in them a luncheon basket with the guns and munitions thereof: even the dogs can be squeezed in along with the "guns," and if the sport does not prove good—well—it is, load up and away to other fields. Without a motor cycle it would mean a wasted day and a return home to

drown the disappointment in—ginger ale.

Angling.

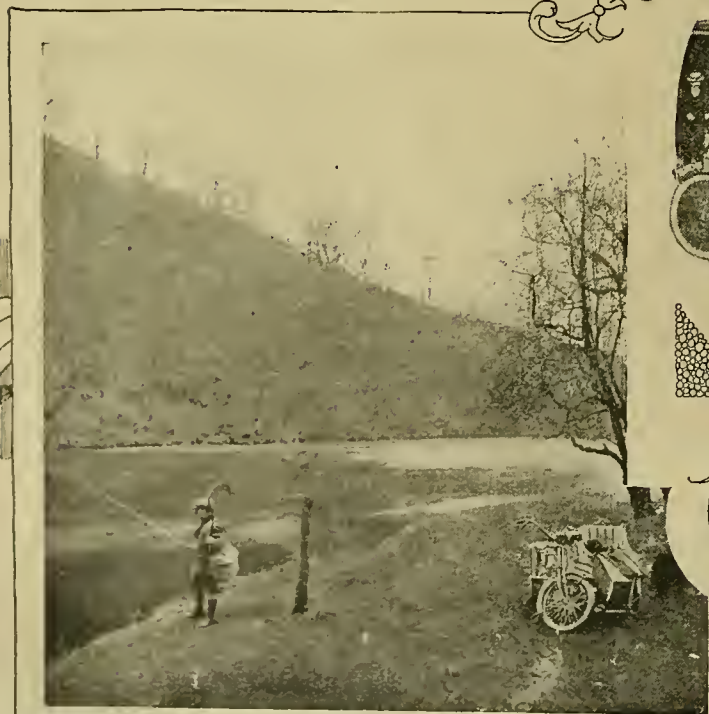
This offers much the same good use for a machine. Many an owner who is lucky enough to have time to fish can tell of the advantage gained by an early arrival, and, indeed, a late stay at his favourite water.



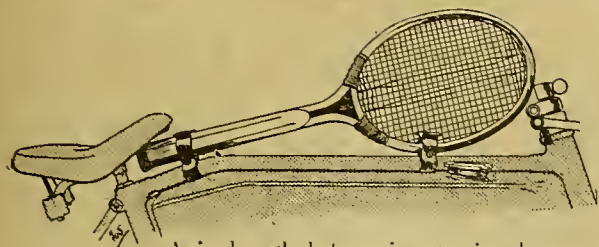
(Left) The motor cycle can be brought close to the river's edge, thus saving the carrying of tackle and food from the inn.

(Right) At most tennis courts and cricket clubs the motor cycle is in evidence.

The delight of lounging after dusk at some trout lay whilst the last orange glow of the sunset is making a mystic glitter on the placid surface and a chorus of murmurs emanates from the adjoining rushes where



The Motor Cycle as an Aid to Other Pastimes. —



A simple method of carrying a tennis racket.

some moorhens are squabbling over domestic matters; a quiet smoke and discussion of piscatorial doings of the day, and of other days; and then an easy return journey to civilisation, form a delightful alternative to the hurried scramble, *sans* motor cycle, to the nearest railway station.

Following hounds may form an interesting occupation for a lazy day, the "following" being confined to anticipating the course and getting up with the hunters at various points of road crossings. With a bit of luck, one may even be "in at the death," but it is as well to remember that Masters of Hounds do not like promiscuous following by outsiders.

Lawn tennis, cricket, and all other kinds of field games come into a class in which the motor cycle forms a quick transport to the scene of operation, and the only points of interest arising are (1) the carrying of racquet, cricket bat and pads, etc., when riding solo, and (2) the question of efficient mudguarding and a clean working engine when riding in flannels. The first can be solved by a type of clip on the fork, of which there are several on the market; but a full cricket bag forms an awkward proposition for the solo rider by reason of its unusual length. The second point is one that may be solved by efficient leg shields, and many riders make use of their machines whilst garbed in "whites" without noticeable detriment.

Golf.

More often than not the golf course is several miles out of town, and some mechanical conveyance is absolutely necessary. It is in conjunction with this pastime that the motor

cycle is more freely used than with any other. At a golf club house on a fine day, one can see a dozen or two motors; sidecars and solo machines being always well represented. The carrying of clubs will generally be found easiest slung over the shoulder, but a little ingenuity will devise a method of strapping a kit on to the forks.

In those countries which are blessed with a reliable type of winter and where the ice comes to stay, not to vanish when the word "skating" is breathed, the motor cycle takes quite a prominent place in winter sports, not only in getting to and from the ice,

but no inconsiderable amount of amusement is derived by running a machine on the ice as a sort of tug-boat for the towing of strings of skaters.

There are some pastimes which do not come under the category of games or sport, but are usually termed "hobbies." These include photography, sketching, and the study of natural history. I believe the motor cycle has been used in connection with the last-named to carry impedimenta to places difficult of access.

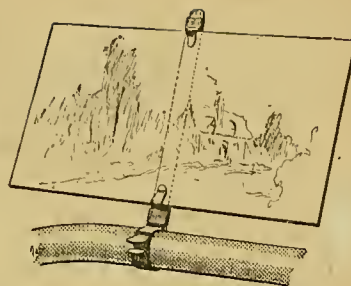
Sketching.

The motor cyclist who is fond of sketching and even the professional artist find motor cycles of remarkable assistance both in getting to the desired spot and in forming an easel and seat. A route card holder or map holder fixed on the handle bar will easily support a sketch block, and the rider can remain in the saddle, provided he can wheel his machine into the desired position. This dispenses with the conventional easel and camp stool.

These are the principal forms of pastime in which the motor cycle plays such an important part, and no other form of vehicle can give such "efficient" service.

F.S.

B25



The sketch block fixed to the handle bar of a motor cycle.

(Top) The sidecar proving its usefulness in "pot hunting." The picture tells its own story



(Bottom) Usually the golf course is a few miles from home, and the economical running of the motor cycle scores greatly over the lightest of light cars.

Motor Assisted Bicycles

WHAT THEY CAN DO AND THEIR LIMITATIONS.

WHETHER the auxiliary motor will ever attain the vogue in England that it has in America it is very hard to prophesy. Nevertheless, it is an undoubted fact that there are many here to whom the motor attachment would appeal. Several such auxiliary motor sets have been offered to the British public, and at least three firms are shortly introducing improved models at a low price which promise to fulfil every requirement. The elderly cyclist shuns any suggestion of complication; the lady cyclist must be convinced of reliability, and other potential purchasers want to know wherein lie the advantages for particular purposes, over bicycles and motor cycles.

Motor-assisted bicycles to some extent overlap the field of both the lightweight motor cycle proper and the pedal cycle, and yet have a distinct scope of their own. For town hack work they should be an ideal form of locomotion, and do all that the lightweight motor cycle can do, hence they should appeal to doctors, nurses, messengers, and business men. The golfing enthusiast and the angler also would find a machine of this type useful. It should require a minimum of attention in the way of adjustment and cleaning, and be capable of going anywhere a pedal bicycle will go, and as those we have seen are light enough to be lifted over stiles, the artist in search of rural scenery could have no better form of transport for himself and his pocket-carried impedimenta. The nature lover and the potterer, too, should find it an equal boon. It must be admitted, however, that



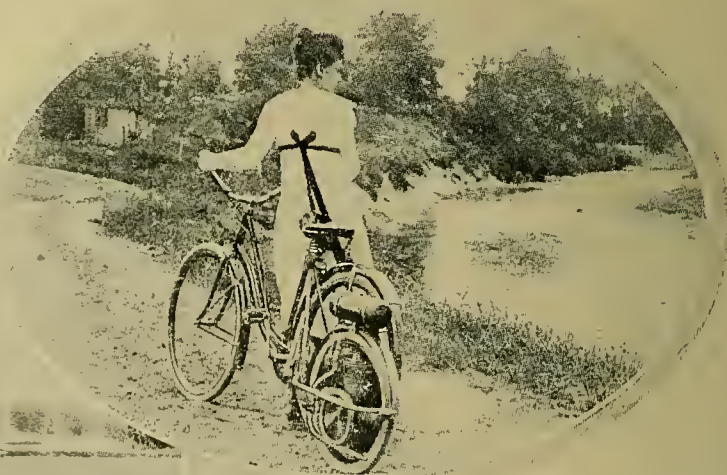
these advantages are in many cases obtainable with lightweight motor cycles. On one point the motor-assisted bicycle should make a strong appeal, and that is the fact that riding such a machine demands no extravagant or heavy clothing. On the latter score alone it should find favour with many.

Then there is the ardent cyclist. Through the agency of this attachment he can greatly increase his radius, save much of the heart-breaking and perspiring uphill work, and yet get his normal amount of exercise as well. This, of course, provided his pedalling gear ratio is sufficiently high; in which connection it would be advisable to have a three-speed hub fitted.

Then lastly there is the ever-present question of price. To the man who already has a bicycle it will cost him the value of another machine.

Social Possibilities.

One aspect of these mounts which is often overlooked is their inherent social possibilities. The main



The motorised cycle makes appeal to ladies on account of its light weight.

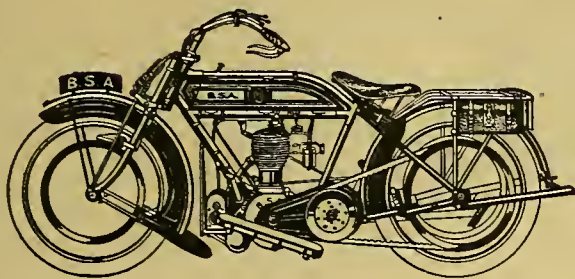


The motor-assisted bicycle is useful to sportsmen in general who desire the conveniences of power coupled with the cleanliness of the pedal cycle.

difference in motor cycle and bicycle club runs is that the motor cyclists are strung over many miles, while the cyclists generally ride in a bunch, and do not need sidecars to provide a conversational companion. The attachment of the motor does not eliminate this advantage. For the person who lives in some town in an industrial area, a trip into the country by bicycle would often entail considerable time lost in traversing uninteresting

B.S.A.

Motor Bicycles



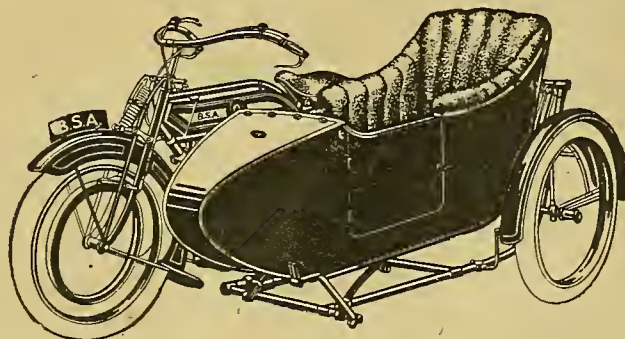
Economy.

One reason for the great economy of B.S.A. Motor Bicycles is the extreme efficiency of the B.S.A. Countershaft Three-speed Gear. This well-known device renders hill-climbing with a sidecar and passenger easy and sure. Business riders, tourists, naval and military men, all testify to the satisfaction which B.S.A. Motor Bicycles are giving, and, whether you require a machine for commercial or pleasure purposes, you, too, will appreciate B.S.A. reliability and efficient service.

*For
Solo
and
Sidecar*

Workmanship.

The more closely B.S.A. Motor Bicycles are scrutinized and tested the more is one impressed by the excellence of B.S.A. workmanship. Every part testifies to the thoroughness of B.S.A. methods. For many years the public has appreciated the value of B.S.A. workmanship, the constant growth of this popularity being fostered by concentrating on B.S.A. Motor Bicycles the most scientific processes known to modern engineering.




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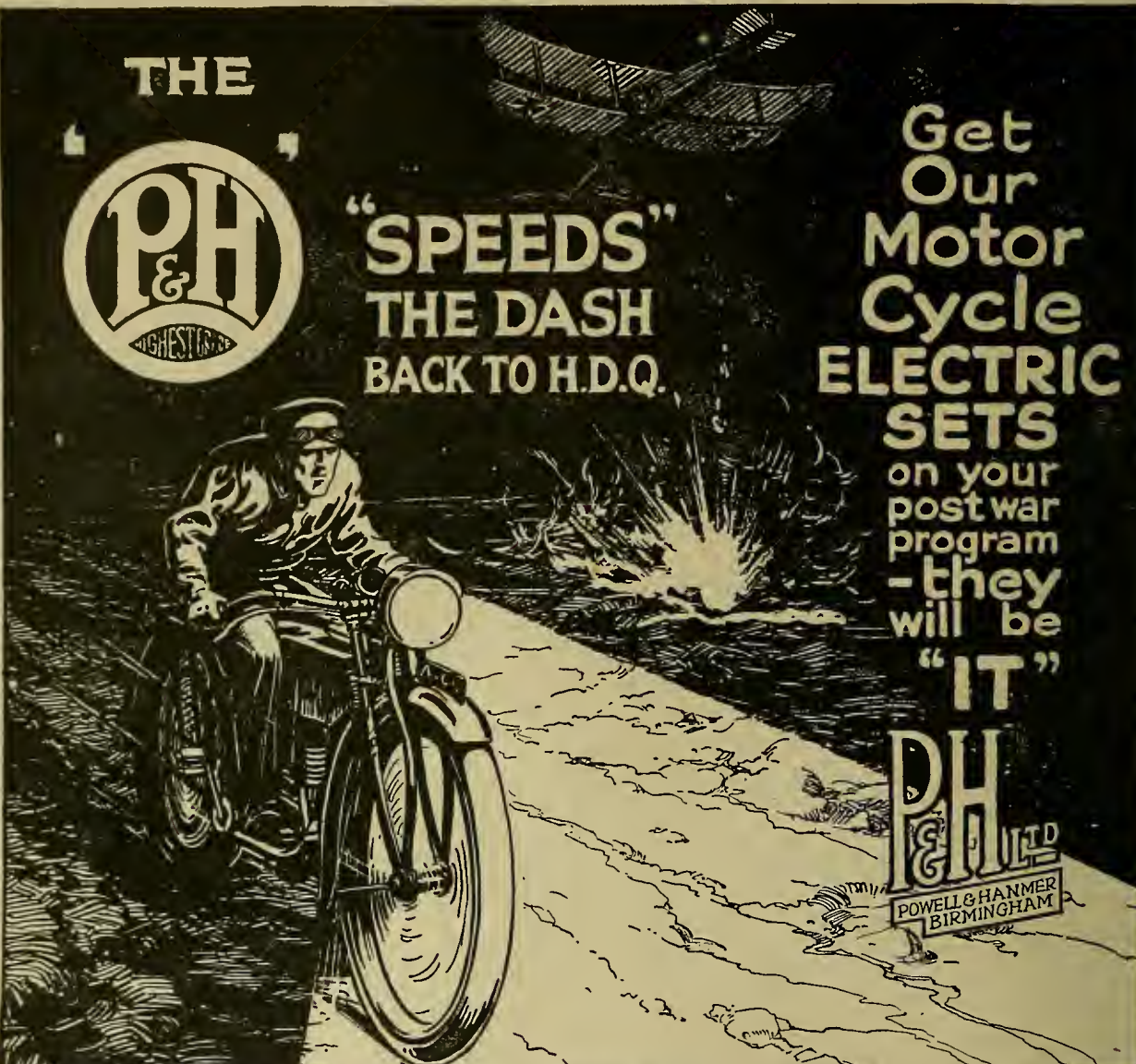
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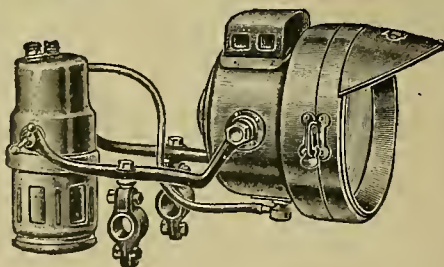
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Motor Assisted Bicycles.—

residential parts, so that the speeding up effect of one of these small machines would save that time and enable longer periods to be spent in rural surroundings.

These, then, are a few of the pleasures and advantages to be gained by the possession of an auxiliary method of propulsion in addition to the bicycle.

Limitations.

When we advance into the range of the lightweight motor cycle proper, we have quite a distinct and separate set of requirements in which the motor-assisted cycle cannot hope to compete with it. The great distinction between these two types of machine lies in the word "auxiliary." The motor cycle is a motor and just sufficient cycle—the reverse is the case with the cycle-motor, where the motor part is distinctly subservient to the bicycle. Here, then, is the limit mark of the motor attachment. It has no serious luggage-carrying capacity. Compared with a motor cycle proper, it is unpleasant to ride for long distances, or for touring over bad roads in bad weather. On the other hand, it is better than a pedal cycle in these respects. A good speed average, compared with the lightweight, is impossible, but again, a higher average can be maintained than by pedal power alone. The motorised bicycle, however, is not intended for high speeds nor for more touring than would be done on a pedal cycle. Its aim is to save fatigue more than to save time. On account of the small tyres and rigid frame, vibration at higher speeds than those at which the pedal cycle is run is objectionable, and also deleterious to the machine. To pedal the machine with-

out the engine assistance, owing to its added weight and the stouter tyres usually fitted, may be said to be somewhat tiring. Its apparent trustworthiness and reliability render it liable to be neglected, and woe to the unfortunate cyclist who finds himself miles from anywhere with a lifeless motor. Again, the elderly rider, inclined to *cynicism*, does not find so small an engine of much use on really steep hills, and pushing it up a hill is a searching test for weak hearts and short-windedness.

Summing Up.

From the various *pros* and *cons*, it will be seen that there is a distinct sphere of usefulness for the bicycle with an auxiliary engine. It will, however, not appeal to those who have been fully fledged motor cyclists, although they may recognise it as a fertile source of recruits to their favourite sport. It does not appeal to the speed man, the solo or family tourist. It should have a public of its own, and these will in all probability be culled from the ranks of the bicycling fraternity, and not from those of motor cyclists. To the latter there is a suggestion of the ridiculous in being perched on a high saddle with a frenziedly revolving engine, bowling along at 20 m.p.h. or less, or pedalling uphill to keep up the revs. It reminds one too much of the old days of l.p.a.

This is the age of wheels, and soon everyone will want some handy quick means of locomotion, not as a passing craze, but as an example of the ever-growing need of industrial, commercial, and social efficiency, and there is a class of rider for every type.

MASCOT.



The proposed new road over Styhead Pass will pass through some of the wildest mountain scenery in England. The new road is shown by the dotted white line the old road being a continuous white line

RECORDS—FROM THE INSIDE.

By VETERAN.

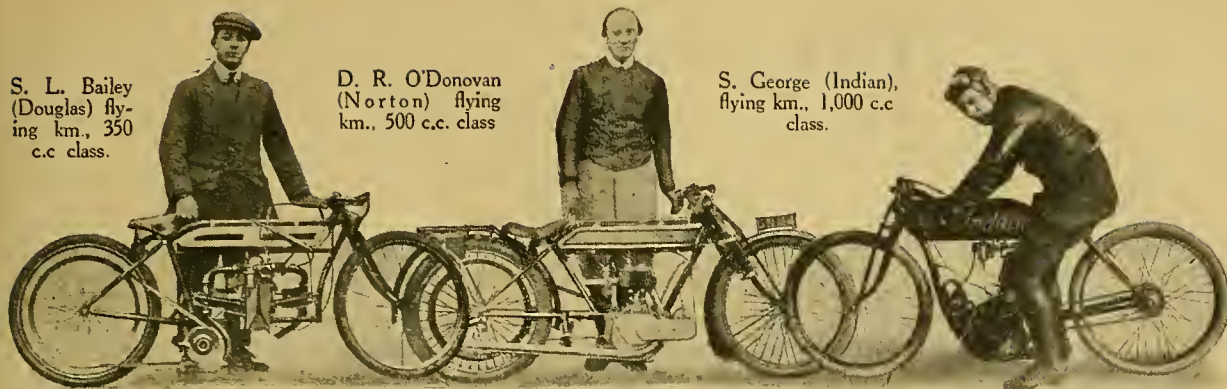
A GREAT change has come over the motor cycle industry during the last few years. When first I knew it, and indeed for many a long year afterwards, there was hardly a theoretical engineer engaged in it. The few engineers we boasted were of the practical craftsman type. They were incapable of designing an engine, but they knew how to make one if somebody else provided the drawings; and on occasion they knew how to fake one, too. So in the earliest days if a firm or an individual contemplated a record-making or record-breaking stunt in the interests of profit or glory, the position was that we had a Continental engine—French, Dutch, or Belgian—Minerva, Kelecom, or Peugeot; and we had to make it do something which the standard patterns could not do, or find some freak man with an indiarubber skin and nerves of steel wire who would dare or stick something calculated to appal any other rider.

There were at this period four main stunt avenues, each of which demanded quite different treatment. You could circle round a small track with semi-flat banking a mile faster than anybody else dare do it. You could try to win a hill-climb. You could essay fame in a reliability trial: these were usually run in penny numbers of 100 miles on successive Saturday afternoons till all the riders bar one had broken down, unlimited tuning up being allowed during the week. Finally you could attempt a long-distance record, e.g., from Land's End to John-o'-

Groat's, which then occupied about three days. The track records at Canning Town, the Crystal Palace, and on the flat grass tracks used for cycle sports were terrific affairs, with Harry Martin, the brothers Chase, and the Colliers kings at the game. Personal recklessness was everything here. Half a dozen of these boys would take machines capable of 50 m.p.h. to a suburban sports meeting in a cricket field, and scrap round a small circle of wet turf marked out by wooden posts and ropes. Tuning had little to do with it. It was simply a question of which man was willing to take most risks. On the gently banked cinder tracks tuning was of some account, but was amateurish, compared to the wiles of a G. E. Stanley. You handled so many engines per year in your job as an assembler of motor cycles. Occasionally you hit a spot engine, on to which you froze. You got all the moving parts nice and lissom; you got all the compression joints dead tight. You tuned up the make and break contacts, and you faked the carburetter. Then you crouched low, and risked your neck at every corner. The early hill-climbs would not raise a thrill nowadays, though we thought them wildly exciting, and the annual Catford C. C. climb at Westerham was so sensational that it verged on the sinful and unhealthy. All the men I have named would be there, with R. M. Brice on his Brown, A. E. Lowe or



(Top) Harry Martin (Martin-Jap), Class A1, under 275 c.c., flying km., flying mile and hour records. (Centre) Left to right, N. D. Slatter (Alcyon), Class A, under 250 c.c., one hour; H. C. Newman (Ivy-Precision), who put up sidecar records in 1913; C. R. Collier (Matchless), Class E, under 1,000 c.c., flying mile. (Bottom) F. W. Barnes (Zenith), Class I, under 1,000 c.c., with sidecar, flying mile; T. B. Haddock (A.J.S.), Class F, under 350 c.c., with sidecar, one hour; E. B. Ware (Zenith), Class I, under 1,000 c.c., with sidecar, one hour; G. E. Stanley (Singer), Classes C (500 c.c.) and D (750 c.c.), one hour. (See table on page 354.)

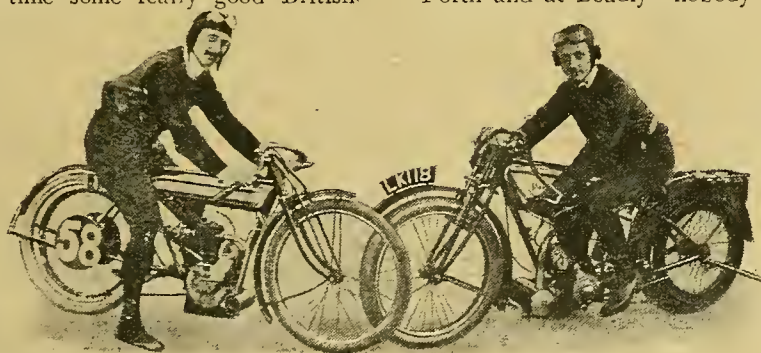


one of the earliest J.A.P. engines, and a few others now lost to fame. Tuning implied little more than I have indicated above, except that numerous secret visits were paid to the hill beforehand with a motor car full of spare pulleys, and the most suitable gear was thus selected. The start was from a standstill, but you were allowed a hefty pal to heave you off, and much depended on whether the engine fired promptly, and whether you could fly into the saddle without wasting a tenth of a second. Behind the scenes most of the makers were ransacking the Continent for new and better engines, and it was not an unknown thing for a man to unearth a new engine somewhere in the Low Countries, bring it to England with deadly secrecy, and make a new crank case to camouflage it, so that no rival should buy a duplicate. One year when two or three of the cognoscenti thought they had got something rather hot, Joe van Hooydonk turned up with more than his usual smile: he had got hold of the first $3\frac{1}{2}$ h.p. m.o.i.v. Minerva, which soon killed off the a.o.i.v. $2\frac{3}{4}$ h.p. brigade. About this time some really good British engines began to appear. The Motor Manufacturing Co. produced a good copy of the $2\frac{3}{4}$ h.p. De Dion, and the Excelsior people put it in a rather weak and top heavy frame, on which Sam Wright and others were all but invincible. The curious Humber chain-drivers, with their engines in the P. and M. position, piloted by Johnny Crundall and Bert Yates, also took a lot of holding, and the British industry began to stand on its own legs. Every now and then I encounter a decrepit sample of one of these pioneer makes offered for £5 or so at a junkshop. I always beg a ride, and marvel that I could have enjoyed my tours on them as I unquestionably did. Yet one always looks back and recalls those old days with pleasure and zest. Not less do I wonder how these single-gear'd mounts carried us all over the map.

Our reliability trials were a literal scream. Redbourne was a favourite venue for the M.C.C. solo trials, and Godstone for the passenger events with primitive sidecars and tricars. The first stop outed you. You toddled steadily twenty-five miles up the road and twenty-five miles back, turning in the width of it until you had done your 100 for the day. If you survived, the performance began again the next Saturday. Leonard Jones, with a miraculous $1\frac{3}{4}$ h.p. tricycle, and Milligan with a 2 h.p. Bradbury, nearly drove the committee crazy. I believe that one summer the pair kept going for about three months.

The End-to-end.

The End-to-end was, of course, too formidable an affair to be taken in hand lightly. To begin with, nobody knew the road, and the rider had to be provided with typewritten route instructions, culled from C.T.C. road books and the like, whilst guides were sought for on the more populous sections. Then steam ferries had to be chartered across the Firth of Forth and at Beaulieu—nobody dreamt of riding round in those days, and the brief rest was welcome to a man who was spending three sleepless days in the saddle of a single-gear'd machine of two cat-power or thereabouts. Hotels had to be warned all along the road, especially for the night hours. It was all very well fixing a zero hour, and wiring the time of your start all down



Class A (under 250 c.c.), flying km., record holder W. A. Jacobs (Singer). Class C (under 500 c.c. with sidecar), C. G. Pullin (Rudge).

the route, but there was never any reason in theory why you should not do the 880 odd miles in two days, and you plotted your schedule accordingly. But it must be admitted that there were often frequent doubts and misgivings. As a rule, the aspirant took two days to get half-way, so his manager had to be perpetually wiring revised schedules to all the hotels, guides, garages, etc. (I know I once scheduled my first 110 miles for three hours, and my manager almost fainted

Records from the Inside.—

when I rode in dead on time.) Then you had to engage your timekeeper—one of the big cycle racing men like Urry or Bidlake. He had to train down to Land's End to start you, and then up to John-o'-Groat's to see you finish. As a rule, you did not finish; but you wired him you would be up by train in a day or two, as soon as a new pulley or piston or crank case had come to hand, and would he please wait and start you off again in a fresh attempt from the reverse direction. All this cost pots of money. Still, many men and many firms had a go at it. Tom Silver set up an astounding record with a single-gear Quadrant in some sixty-four odd hours, an average speed of about 12 m.p.h. including all stops. To sit such a machine practically continuously for the best of three days was some feat. Even in daylight, when the engine was running well and clear vision made a rush possible, I don't suppose it could have climbed such hills as Shap and Berriedale. At night rushes were impossible, because lamps were bad and the rider never knew when a hill was coming: so incessant "l.p.a." would be the order of the day. Belts, of course, gave continuous trouble. Valves and piston rings wore down at an amazing pace: even cams could not always be trusted, and the ignition contact breaker required fairly frequent adjustment. The highland section of the route was in very bad order, the strip from Struan to Kingussie being more or less overgrown and unrepaired. There were giants in the land in those days, and Tom Silver was one of them.

End-to-end in 48 Hours.

Then G. P. Mills put a two-speeder at the course, and cut the time down to forty-eight hours. His Raleigh machine had two separate chains from the countershaft to the rear, and he coupled up either of them by means of dog clutches in the hub. He struck terrible weather on the northern half of the run, but profited by familiarity with the roads owing to his numerous pedal cycle records.

Trade jealousies are probably responsible for the yarns that some of the record-breakers used up whole relays of machines. Such libels were bound to spread when no official body could supervise the ride, because the speed limit—12 m.p.h. in Silver's day, and later 20 m.p.h.—was exceeded.

I shall always remember how I once happened to be sleeping at an hotel bordering a southern patch of the course, when about 2 a.m. I heard a bevy of motor bicycles tear past "hell for leather." I guessed what it was, and, tumbling out of bed, slipped overalls on top of my pyjamas and ripped after them. I never caught them, and the attempt on record failed. Rumour was that this particular aspirant had about six companions to escort him along bits of the road which he did not know too well—one to lead him, and the rest behind in case of accidents. On this occasion I believe the leader took a sharp corner rather too daringly, and the whole crowd, including the record-breaker, piled up in a heap on top of him.

There are many interesting bits of secret history anent a later chapter of records, *i.e.*, those associated with Brooklands. But few of them are known to more than the handful of people most intimately concerned. One or two of them prove that even at a comparatively late date pukka engineers were not at the bidding of

all our motor cycle firms. Certain proprietary engines, much used by assemblers, had acquired such a vogue that the manufacturers began asking stiff prices for them, which cut into the assemblers' profits. So the assemblers conceived the idea of making their own engines, and so saving the middleman's profits. Two such firms asked friends of mine to design engines for them at a price. In each case the assembler had devised an engine which would do for his touring mount, but it was no good for speed stunts. My friends were both engineering students, so to speak, and quite incapable of planning real hot-stuff engines: but they did their best. One of them "designed" an engine for the hour record, which when thoroughly tuned lapped Brooklands at about forty, to his great dudgeon; but he got his fee all right, because he accidentally discovered it would climb any hill at forty, if suitably geared, and the firm got a lot of kudos with it, though they never dared to use it for anything else. The other special hot-stuff engine was a complete washout; and both firms ultimately returned to their first love.

Camouflaging the Secret.

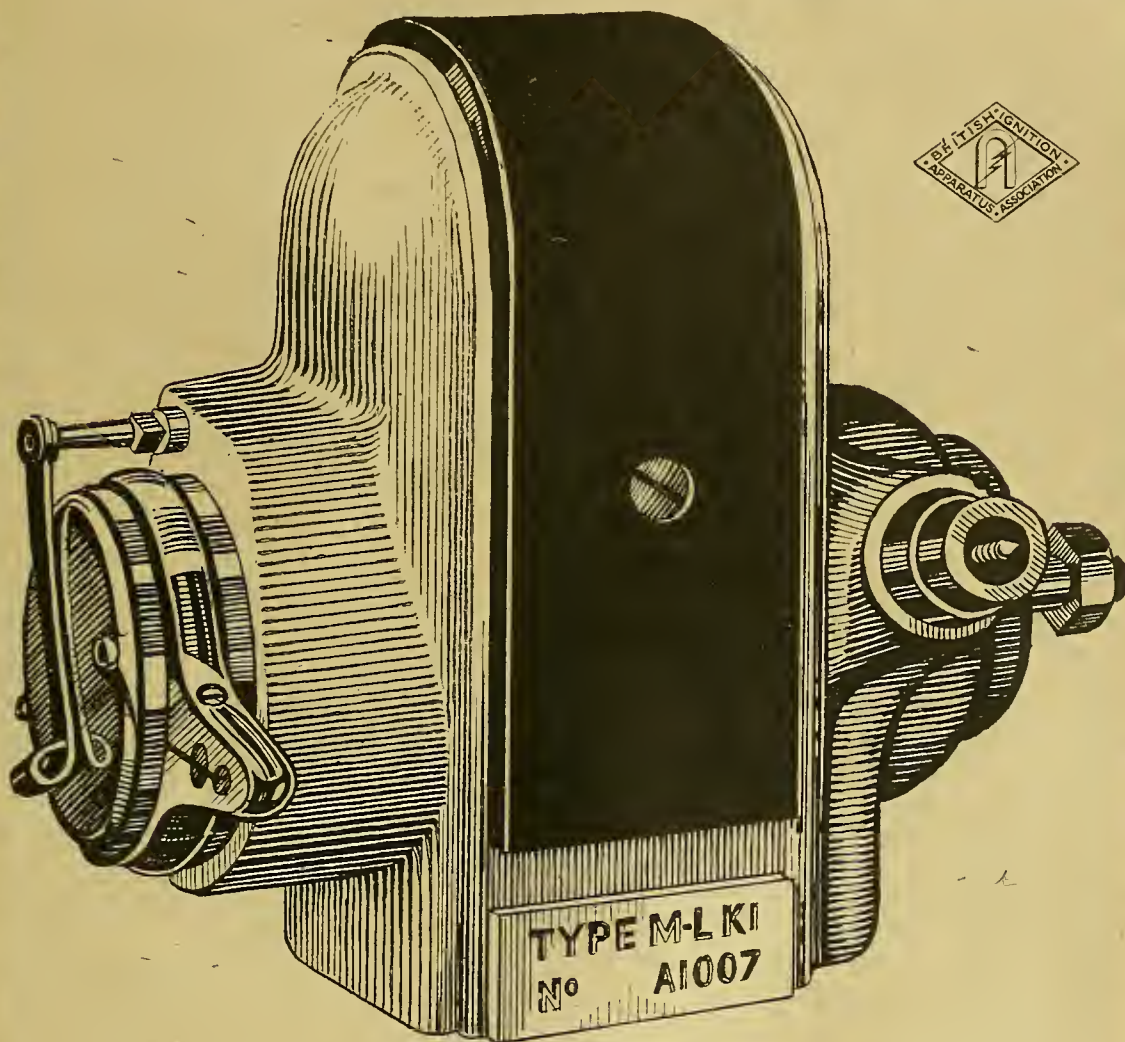
Meanwhile, Rudge, Douglas, Triumph, Norton, Singer, and J.A.P. were steadily cutting down all the standard figures, and immense activity was displayed in contouring cams and valve passages. The great thing was to camouflage your real secret. If you hit on some little gadget which lent another mile an hour to your engine, you pretended it was really something else, and when you put your machine away, you furtively removed the magneto contact breaker or the valve cams. Some rival was sure to spot this harmless action, draw wholly false deductions, and waste tons of steel and many hours in experiments which probably led nowhere at the finish.

One bright lad completely flummoxed a very famous designer. He bought one of the designer's standard T.T. machines, did something to it, and then challenged the designer to a private test. The designer's machine got the worst of it in a brief sprint: not by a big margin, but by enough to matter in an hour record. The designer finally paid over good money for the secret, and was mortified to discover that the inventor had merely raised the compression.

The Speeds of the Future.

Before long this old game will reopen, and as we have now got plenty of real engineers in the motor cycle game, and air-cooling has got so far since 1914, we shall see some astounding stunts. There is no reason why the short flying start records should not be fought out with four valves per cylinder and compression ratios as high as $6\frac{1}{2}$ to 1. The cooling will stand it nowadays, and patent fuels, embodying benzole, do not object to super-compression. I know one engine which makes standard aero plugs wilt like tallow candles in a New York summer, and I fancy there will be plenty of fun. But I am sorry for the boys who have to sit these mile-eaters. A flying mile or kilometre is not so bad, though the tiniest hesitation or unsteadiness at 80 or 90 m.p.h. means immediate death. But the idea of an hour record on two-wheelers at such speeds as are now technically possible is frightful on the very best of tracks; and I am not at all sure that the B.M.C.R.C. ought to allow long distance motor cycle records at such speeds.

ALL-BRITISH MAGNETOS

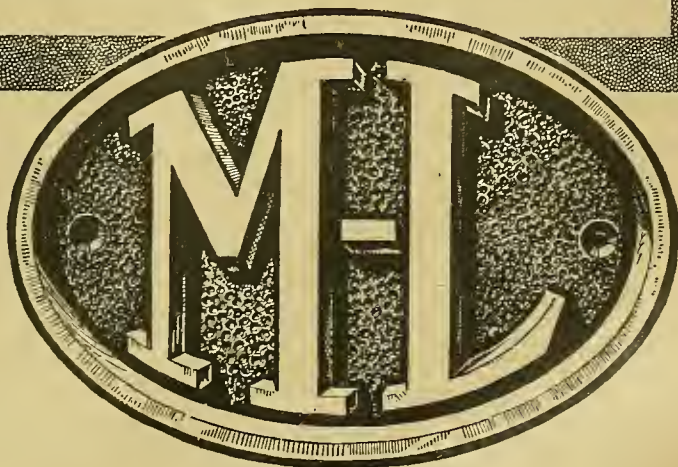


M-L Type K1, for standard single-cylinder motor cycle engines, $3\frac{1}{2}$ to 6 h.p.

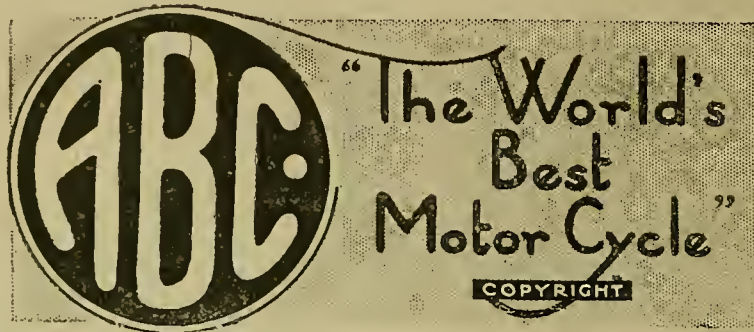
A 2,000 Sparks-per-second Test

The parts of an "M-L" Magneto are tested to a very high voltage—20,000 volts for the moulded insulation and 15,000 for the armature. In the latter case the test is made at a frequency corresponding to 2,000 sparks per second—about twenty times the maximum rate which can ever be called for in service. Quality tells.

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The Right
Sidecar Machine
The New 3 h.p.



IS A
Perfect Chaperon
VERY UNOBTRUSIVE, WANTS
LITTLE OR NO ATTENTION,
BUT LOOKS AFTER TWO
PEOPLE VERY THOROUGHLY

It is meant for sidecar work, but it gets its strength from the lightest and most specialised materials, and its power from scientific engine design. Its function is to transport people with the maximum of comfort and efficiency—there is no prodigality of useless metal to pull the speed down and add to wear and tear.

The little engine and its four-speed gear box are not to be daunted by any hill—they have aeroplane traditions to uphold. They know all about **SPEED** and **CLIMB**.

And the wonderful suspension makes the saddle as luxurious as the Sidecar.

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RUNABOUTS AND CYCLE CARS.

THE cycle car proposition is again in the melting-pot. Whether it will emerge as a vehicle mechanically sound and as efficient as the two types it is supposed to bridge (the sidecar and the car) has yet to be proved, for, excepting the Morgan, the several machines which are promised for this year are new designs, untried, so far as the public is concerned, and in many cases untried also by their sponsors.

Whether present-day designers of these little vehicles will profit by the failures of their predecessors remains to be seen. From the advance specifications of some of the proposed machines, one gathers that there are quite a number of venturesome spirits ready to risk their all in machines which embody features having little to recommend them. On the other hand, several well-known firms have in hand runabout propositions embodying nothing which is not tried and proved practice.

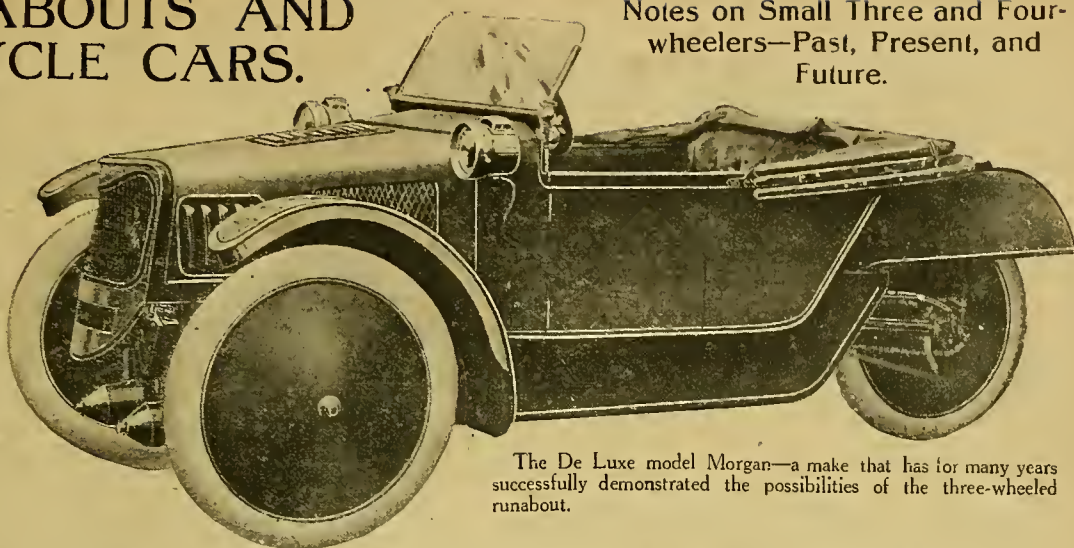
It may be an open question which policy will most help the development of the runabout; but, while the future of the type is in the balance, the soundest policy appears to be one which plays for safety rather than to exploit individual ideas of doubtful value.

Wanted—the Next Stage to a Sidecar.

It seems tolerably certain that the miniature car type of vehicle will not have a place in the cycle car field for some time to come. Manufacturing costs prohibit a vehicle embodying such things as four-cylinder water-cooled engines, shaft transmission, and differential axles, from being produced at a price which will allow it reasonably to be classed as a cycle car—a type of vehicle which essentially is nearer to the sidecar than to the car in the matter of price.

On this point it is difficult at the moment to state an approximate price at which a cycle car should be

Notes on Small Three and Four-wheelers—Past, Present, and Future.



The De Luxe model Morgan—a make that has for many years successfully demonstrated the possibilities of the three-wheeled runabout.

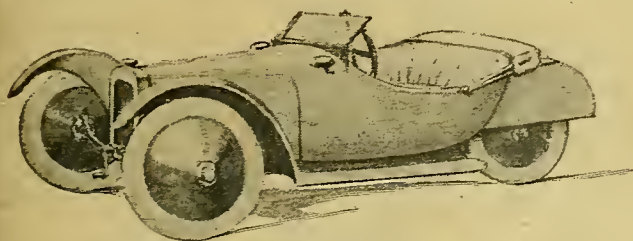
sold. The average sidecar outfit costs about £110. The average light car figure will be perhaps £250. Therefore, it is perhaps permissible to quote £150 as a fair price which can be asked by makers of cycle cars. If this is so, then probably there may be several new vehicles which will come into the class with engines in the neighbourhood of 1,000 c.c. and of very light weight.

On the other hand, it is questionable whether £150 is not too high a figure for the class of buyer who is considering the purchase of a cycle car, for it must not be overlooked that a vast proportion of potential buyers of such vehicles are those who are quite satisfied with a sidecar except for the absence of protection for the driver. It must follow, of course, that if there is a great demand for motor vehicles at £300 and at £150, there will be a field for another at £200; but the cycle car proper is a proposition interesting motor cyclists, and when the price reaches £200, it appeals more strongly to the buyer of a car, with which type of vehicle it comes into competition. At the moment, the solution of the cycle car problem may be looked for in a first-class three-wheeler—four wheelers promise to be too expensive this year.

Pre-war Types.

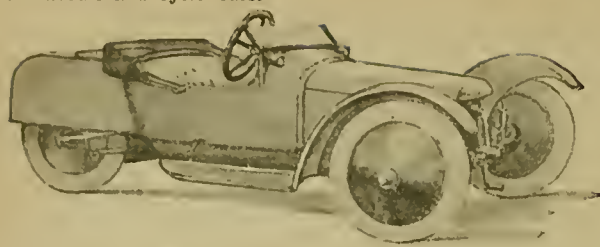
Pre-war cycle cars were of many types, and included the following:

- (1.) Three-wheelers with the engine at the rear of the seats and driving the single rear wheel by means of a chain or chains.
- (2.) Three-wheelers with single wheel at the rear and the engine at the front.
- (3.) Three-wheelers with the single wheel at the front.
- (4.) Four-wheelers with the engine at the rear driving live axle by chain.
- (5.) Four-wheelers with chain or shaft transmission to countershaft, final drive by belts.
- (6.) Four-wheelers with all chain transmissions.
- (7.) Four-wheelers with friction transmission and final drive by shaft.
- (8.) Four-wheelers with friction transmission and final drive by chain.



The Premier Super runabout, which is now on the road in an advanced experimental stage.

Runabouts and Cycle Cars.—



The L. S. D., a Huddersfield production, having an air-cooled V twin engine and shaft-cum-chain transmission.

(9.) Four-wheelers with shaft transmission and with twin engines.

(10.) Miniature cars, as the Singer.

The first-mentioned type, although reliable, was not fast, and the most successful machine in this group—the A.C. Sociable—has been abandoned. It is not expected that any machines of this type will be introduced.

Undoubtedly the success of the Morgan has been responsible to a large extent for the revival of the cycle car, and several machines in the second group will be marketed shortly.

The third type finds no supporters now, but the fourth (the Carden type) will be revived.

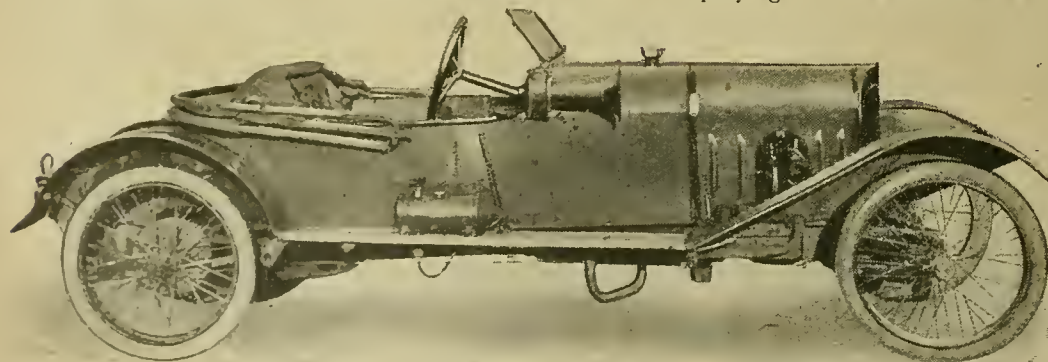
Type 5, with final drive by two belts, appears to have been abandoned altogether, which is significant, considering that this was the most general form of transmission on cycle cars of 1911 and 1912. The G.N. in future will be chain-driven, and the Buckingham will be an orthodox light car. The last Adamson to be built had shaft transmission, while there is no news of the Victor.

All-chain driven cycle cars are conspicuous by their absence in post-war programmes, excepting where the engine is placed at the rear and drive direct to the axle.

Type 7 is no longer represented by the well-known G.W.K. cycle car, which has been abandoned in favour of a larger car accommodating four persons. Another maker, however, will introduce a small car embodying the same system of transmission.

All the pre-war vehicles in Type 8 have been abandoned, and the companies concerned no longer exist. Undeterred, however, by these failures, at least three other makers are taking their place.

Type 9, so far as transmission is concerned, will be represented by three well-known firms, but probably the vehicles will be very different propositions from the Humberette and Swift, the most successful little cars



The 1919 G.N., a four-wheeler built on true cycle car lines.

in this group which have been abandoned in favour of larger vehicles.

The tenth and last type—the miniature car—has been developed in many cases until with a larger engine and longer chassis it is a "large" car of the lighter type. The miniature car is no longer a cycle car—only the Singer remains of the original group with engines under 1,100 c.c., and even this small car cannot be said to conform to the old cycle car definition on the point of weight.

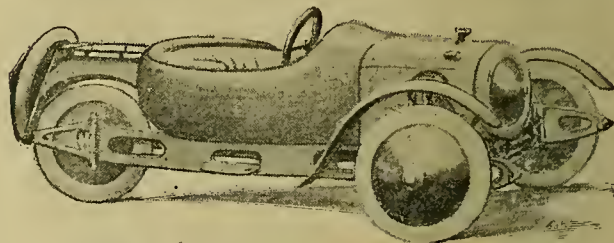
In addition to the ten types mentioned, there was the vehicle built on sidecar lines and fitted with a two-seated body. At least two such machines will be in evidence this year.

The Post-war Types.

The following is a list of runabouts and cycle cars now being produced or promised for this year.

Name.	Type.	Transmission.
A.B.C.	4-wheeler, a.-c. flat twin engine.	.. Shaft.
A.C. Bantam ...	4-wheeler, w.-c. flat twin engine.	.. Shaft.
A.V.	4-wheeler, a.-c. V engine at rear.	.. Chain.
Carden	4-wheeler, a.-c. V engine at rear.	.. Chain.
Cosmos	4-wheeler, a.-c. 3-cyl. radial engine.	.. Shaft.
Eudrick	3-wheeler.	.. Shaft.
G.N.	4-wheeler, a.-c. V engine, 90°.	.. Shaft and 4 chains.
H.F.G.	4-wheeler, a.-c. flat twin engine.	.. Friction and shaft.
L.S.D.	3-wheeler, a.-c. V engine.	.. Shaft and chain.
M.B.	3-wheeler, V engine.	.. Friction and chain.
Milton	4-wheeler, 2-cyl. 2-stroke engine.	.. Friction and chain.
Morgan	3-wheeler, a.-c. or w.-c. V engine.	.. Shaft and 2 chains.
Palladium	4-wheeler, a.-c. flat twin engine.	.. Friction and chain.
Premier	3-wheeler, w.-c. V engine.	.. Shaft and chain.
Scott Sociable ...	3-wheeler, w.-c. 2-cyl. 2-stroke.	.. Shaft.
Wooler	3-wheeler, a.-c. flat twin engine.	.. Belt and shaft.

Excepting the Morgan, all the cycle cars promised for 1919 are new designs. Even the G.N. is altered



The Wooler Mule, a three-speed flat twin-engined runabout to be marketed by the maker of the Wooler motor cycles.

to such a degree that it may be regarded as a new proposition—and consequently has to prove its efficiency. True, many of its features have been proved efficient in the older model, but the final transmission employing four chains is new so far as the public is concerned.

The Scott Sociable has been undergoing tests for several years, and Mr. Alfred A. Scott is not likely to place it on the market until he is satisfied that everything is right, but here, again, the public has not yet had an opportunity of trying the machine, and to all

TRIUMPH

IS a Trade Mark but—it's also a symbol!

To every man who rode a TRIUMPH in the War it suggests reliability—comfort and security. He thinks of episodes—blinding along “all out” to get through in time—bumping and bouncing over broken roads—“soloing” through the mud and grease, and then—he realises what the dependability of the TRUSTY TRIUMPH meant to him! Realises what a mechanical failure would have resulted in!

NOW—he's going to ensure that his Peace mount will be a TRIUMPH, by going to his nearest Agent right away.

The moral being—well, can you think of a better machine?

LONDON DEPOT—218, Great Portland Street, W.1
Also at Leeds, Manchester, and Glasgow.

Triumph Cycle Co., Ltd.,
Coventry.

Remember

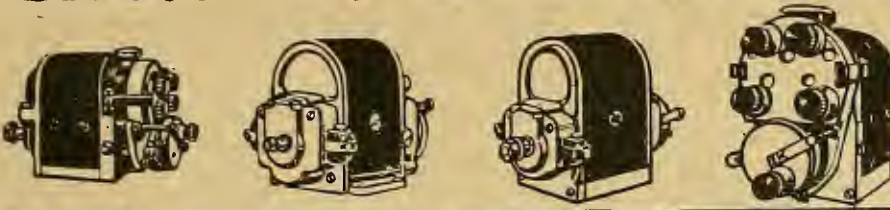


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The 'Standard' Model.

Specification and Prices of the G.N. Standard and Vitesse.

ENGINE.—The engine is the 90° air-cooled twin, which has been fitted to the G.N. since 1912.

The G.N. engine is vibrationless, the running balance is superior to the balance of an ordinary four-cylinder engine.

Its two cylinders, 8½ x 9½, give a capacity of 1098 c.c., and the G.N. system of air-cooling, with deep cooling fins and arrangement of inlet and exhaust valves, gives excellent results. The engine is placed across the frame, and the cylinder heads and exhaust ports are very thoroughly cooled by the full and direct air draught.

A large external flywheel is fitted and gives very steady running and slow pulling.

The rockers operating the overhead inlet valves are entirely enclosed

in a neat casing, cast integral with the dome.

The cylinder heads are easily detachable, and their extreme accessibility enables carbon deposit to be removed in a few minutes.

The Vitesse model has a specially tuned engine with overhead valves and lightened reciprocating parts, it is capable of high speeds and is practically a racing edition of the Standard engine.

On both models the engine is mounted in the frame by a system of three-point suspension.

LUBRICATION.—G.N. system of semi-automatic pump, delivering direct to crankshaft bearings, air-cooled sump to crank case.

TRANSMISSION.—Through 3-plate G.N. clutch to bevel-driven cross-

shaft, thence by Renold roller chain to rear axle. Drive is taken through only one chain at once, and all changes are made by substantial hardened steel dog-clutches. The transmission is simpler even than on the past Grand Prix models.

SPRINGS.—G.N. semi-cantilever springs with radius rods.

STEERING.—A neat steering gear box is fitted with bevel-gearing.

WHEELS.—G.N. detachable and interchangeable wire wheels, 650 x 65, with spare wheel and bracket.

WHEELBASE.—Standard 8ft., Vitesse 8ft. 6in., track 3ft. 6in., overall length 10ft. 3in., width 4ft. 2in., height 3ft. 4in., with screen 4ft. 1in. Ground clearance 9in. Weight, Standard, 6½ cwt.; Vitesse, 5½ cwt.

The STANDARD MODEL. With detachable interchangeable wheels, but not equipped with accessories - - - £140

Fully equipped with hood, screen, dynamo lighting set with head lamp, side and tail lamps, spare detachable wheel with tyre, horn, pump, tool kit, jack, and number plates - - - - - £167 10

The VITESSE MODEL. With detachable interchangeable wheels, but not equipped with accessories - - - £170

Fully equipped with celluloid screen, dynamo lighting set with head lamp, side and tail lamps, spare detachable wheel with tyre, horn, pump, tool kit, jack, and number plates - - - - - £195

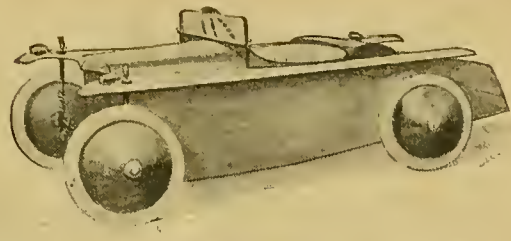
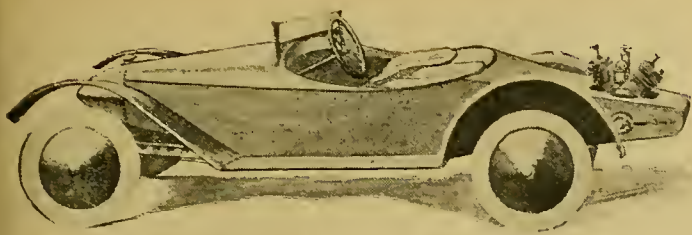
FURTHER PARTICULARS, WITH FULL SPECIFICATION, TERMS, ETC., WILL BE GLADLY POSTED ON APPLICATION.

G.N. LIMITED,
ETNA WORKS,



ALBERT ROAD,
HENDON, N.W.4

Raymond.



Two 1919 four-wheeled cycle cars. (Left) The A.V., which closely follows the line of the pre-war Carden. (Right) The 1919 Carden, having enclosed engine at the rear.

The A.V. is practically an improved Carden, while the 1919 Carden is a new design, embodying many new features. The Wooler three-wheeler is to have a primary drive by three belts over variable pulleys, and a final transmission by shaft and worm.

There are several other three-wheelers, including the Endrick, of which very little is known at the present time. The M.B., a friction and chain-driven vehicle, and the L.S.D. with shaft and chain transmission, are both products of Northern firms. Then there is the new Premier runabout, which appears to be all that is claimed for it. Unlike the majority of the new cycle cars, this vehicle is on the road.

The Palladium and H.F.G. employ friction and chain and friction and shaft respectively, while the A.C. Bantam, A.B.C., and the Cosmos will have more or less conventional car transmission by shaft.

Perhaps the most interesting engine of the new vehicles is that which will be fitted in the Cosmos cycle cars. This will follow aero engine practice very closely, having three cylinders arranged radially. Of the other engines, two are water-cooled two-stroke twins—the Scott and the Milton. The G.N. has a 90° air-cooled twin, and the Premier, Morgan, A.V., Carden, M.B., and L.S.D. are fitted with V twins. No fewer than five of the sixteen vehicles mentioned will have flat twins. These are the A.B.C., the A.C. Bantam, Wooler, Palladium, and H.F.G.

From the above it will be seen that, taken generally, the post-war runabout and cycle car are new propositions, and, while a limited number may be sold during this summer, they appear to be 1920 models rather than belonging to this year's output.

VEDETTE.



The famous Dunchurch "avenue" in its present desolation. The fine elms, after much controversy, have at last fallen to the axe of the woodman. The outfit is a 5-6 h.p. twin Rover.

THE magnificent avenue of elms on the Dunchurch Road, near Coventry, has long been threatened.

But now the threat has been carried into effect, one passes along this famous stretch of the Telford highway with, one might almost say, sentimental distress. What was one of the most glorious avenues in the Midlands is now a desolate waste. No doubt there were good reasons for its destruction, one of which was the inner decay of many of these noted

elms, this constituting a big danger to passers-by. The outfit on which we visited the scene was a 5-6 h.p. Rover, driven by Mr. Ravenhill, the works manager of the Rover Co., and, although not a proper road test, the impression obtained was decidedly favourable. Smoothness, silence, and power are three attributes that purchasers of high-powered outfits will look for in the future, and these points were particularly noticeable in the Rover outfit.

CURRENT

Times to Light Lamps.

SUMMER TIME.

April 3rd	...	8.3	p.m.
" 5th	...	8.6	"
" 7th	...	8.9	"
" 9th	...	8.13	"

The Strength of the A.C.U.

Counting the members of affiliated clubs, the total strength of the A.C.U. is now 30,000.

A Rumour.

A rumour is abroad that the Moto-socoché firm, the manufacturers of the famous M.A.G. engines, intend to start a factory in this country. The M.A.G. engine is a fine production, and its admirers will be pleased to learn that in the near future it will be British instead of Swiss made.

Petrol Profiteering.

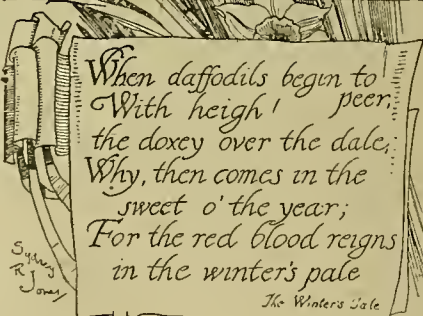
The Home Office has circularised the police authorities throughout the country asking them to do their best to see that the vendors of petrol comply with the requirements of the Petrol Retail Prices Order. Those of our readers who are overcharged should communicate with their local police.

The Proposed Sty Head Pass Road.

It is, we are informed, extremely likely that the proposal to construct a road between Wasdale Head and Borrowdale will be decided at the next meeting of the Cumberland County Council. A correspondent who talked the matter over with an influential member of the Council informs us that there will probably be a strong majority in favour of making the road at once.

London-Edinburgh Run.

Every endeavour is being made by the M.C.C. to hold the London-Edinburgh run this year, which will probably take place in June, competitors starting on the evening of the 6th and arriving in Edinburgh on the evening of the following day. It has been suggested that the London-Edinburgh this year will be a more or less "go as you please" competition. Entrants to qualify for a gold medal must complete the journey in twenty-two and a quarter hours, twenty-four hours for a silver, and thirty hours for a bronze medal. Arrangements for meals en route will be made by the club if possible, otherwise each competitor will have to look after himself, owing to the present difficulties in catering. There will be no secret checks, but competitors will be timed at certain points to see that they do not exceed the speed limit, and any competitor who is a quarter of an hour ahead or behind schedule will be disqualified. This year there will be no return journey. The hon. sec. (Mr. Southcomb May, 15, Endsleigh Gardens, London, N.W.1) will be glad to hear from members and others who will volunteer to help.



Taxes.

Speaking at the A.C.U. meeting in Birmingham, Mr. E. S. Shrapnell-Smith mentioned that the pre-war 6d. per gallon on petrol for private cars and 3d. for commercial vehicles yielded £4,000,000 revenue, and that a further million was derived from the annual licences, making a total of £5,000,000.

It has been stated that the Government intend to spend twenty millions on the roads. Before the war fifteen millions were spent annually, but sometimes "road improvements" included pavements, lighting, water, electricity, etc. Of this sum motorists contributed about 10%; if the supertax remains they will be contributing nearly 50% of the total cost.

CHAT

Special Features.

ANNUAL SPRING NUMBER.

Special Articles and
Photographs.

Police!

Henley-in-Arden (Warwickshire) police were busy examining driving licences during the past week-end.

Scottish Oil Mine Closed Down.

The Addiewell oil mine, Linlithgowshire, one of the pioneer shale oil mines in Scotland, has been closed down indefinitely owing to labour troubles.

A Bargain.

In a list of "bargain" advertisements the following quaint description appeared last week in the *Evening News*: "Seven-nine twin Brown engine, 8 horse Sturmev Archer 3 speed hub, heavy frame and sidacar, what offer."

Mr. Alfred Bednell Resigns.

Mr. Alfred Bednell, O.B.E., has resigned his appointment as general manager of the Cycle and Motor Cycle Manufacturers' and Traders' Union, but until his successor is appointed he will continue to be in charge.

Fuel for a Quarter Million Miles.

Mr. S. Henshaw, vice-president of the National Benzole Association, recently told a meeting of motor cyclists that he was prepared to accept orders for railway tanks of benzole. These have a capacity of 2,500 gallons, or sufficient for a quarter of a million miles with a 3½ h.p. machine.

An Auto-wheel Case.

Recently, at Mortlake Police Court, a reader of *The Motor Cycle* was summoned for using a "motor car" with a motor cycle licence. The summons was issued by the Surrey County Council, who averred that his hand-propelled tri-cycle, to which an Auto-wheel was attached, was a motor car, and therefore required a full motor car local taxation licence. The Surrey County Council was also supported by the local taxation licence authorities. Our reader (who is a cripple) defended the case himself, and it was unanimously dismissed by the bench of magistrates.

A New Relief Road.

The suggestion that a relief road should be made on the London-Brighton highway between Thornton Heath and Purley is now in a fair way of being carried out. Already the Croydon Borough Council are proceeding with its construction. The average width of the carriage drive, which will commence at Thornton Heath Pool, cross Waddon Marsh to the left of the National Aircraft Salvage Depot and the Wallington Aerodrome, and join the main road at Purley, is about sixty feet. It will be constructed of dustless materials, and have the foot-ways bordered with trees, the estimated cost being £148,237.

T. T. WINNER, 1914.

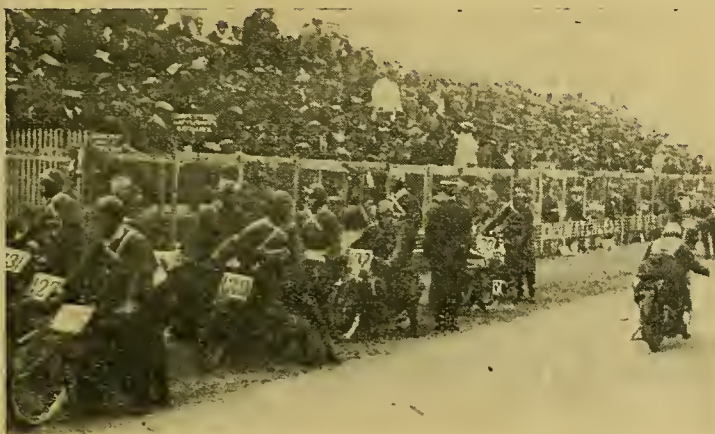
Rudge Multi

START!

ANTICIPATION.



By Appointment
Cycle Makers to
H.M. KING GEORGE



The start of the Senior Tourist Trophy Race caused anticipation of victory to many riders—particularly to Mr. C. G. Pullin, who pinned his faith entirely to his Rudge-Multi.

His Multi gear enabled him to keep his machine at the top of its power, no matter what the gradient of the road.

His Rudge - Multi aided him thus to—

FINISH!

REALISATION—VICTORY.

Rudge-Multi, the machine which won the Senior Tourist Trophy Race, Isle of Man, May 21st, 1914. The average speed was 49 m.p.h.

Now the War is over, and we can again divert our energies to the manufacture of Rudge-Multis.



Write for particulars to—

RUDGE-WHITWORTH, LTD.

(Dept. 600), COVENTRY.

LONDON: 230, Tottenham Court Road, W.1. (Oxford Street End).

In answering this advertisement it is desirable to mention "The Motor Cycle."

C17

"Sales of Government Motor Cycles."

"Quite a buzz of excitement was felt when the Auctioneer announced that he had now come to the 3½ h.p. Sunbeams. One was sold for 57 guineas and one for 56 guineas. Bidding was very spirited for these machines."

Vide "Motor Cycling," Feb. 4th, 1919.

THE VALUE PLACED BY THE PUBLIC ON SUNBEAM MOTOR CYCLES CAN BE ESTIMATED WHEN WAR-WORN SECOND-HAND ONES COMMAND SUCH PRICES.

MAKERS :

JOHN MARSTON, Ltd., 11, Sunbeamland, WOLVERHAMPTON.

London : 57, Holborn Viaduct, E.C., and 157-158, Sloane Street, S.W.

FOR EFFICIENCY & DURABILITY USE



**"THE
PERFECT
NON-SKID."**

Price Lists on Application to—
ROM TYRE & RUBBER CO. (1909), LTD.,
36, Brooke Street, HOLBORN, LONDON, E.C.
'Phone—Holborn 1613 'Grams—' Romdon Helb London'



Brig.-Gen. H. P. Maybury, secretary and manager of the Road Board, who is to be placed in charge of the special Roads Department of the new Ministry of Ways and Communications.

The Price of the A.B.C.

Owing to the fluctuating costs of material and labour, the Sopwith Aviation Co. has not been able to make any definite announcement concerning the price of the new 3 h.p. A.B.C. We are now advised that the price has been fixed at £85.

Club Representatives on the A.C.U. Committee.

The following is the result of the postal vote for electing club representatives on the A.C.U. committee:

Votes.		Votes.	
T. J. F. Forse ..	78	L. Martin ..	62
R. V. C. Brook ..	74	E. J. Bass ..	60
V. Horsman ..	71	J. St. John ..	60
A. V. Ebbelwhite ..	69	F. A. Applebee ..	55
A. G. Reynolds ..	69	F. S. Whitworth ..	54
J. R. Sylvester ..	66	S. J. Ellis ..	53
A. D. Arter ..	65	F. Murray ..	53
W. H. Egginton ..	65	J. L. North ..	51
W. Weldon ..	63	F. A. Hardy ..	47
F. W. Barnes ..	62	I. Buckley ..	45

Competitions Abroad This Year.

The Swiss have decided to organise several motor cycle trials, and the Italian club, the Motor Cycle Club of Turin, intends to organise the famous Mont Cenis hill-climb, which consists of a fourteen-mile run, uphill all the way, and includes, so the announcement states, the terrible hairpin corners on La Scala. These terrible hairpins are not so terrifying after all, as they are not so bad as the Devil's Elbow or the hairpin bends in the Isle of Man. The severity of the trial is not in its gradients, but in its length, which imposes a very severe strain on an air-cooled engine. Such a test is not possible in the British Isles, and we should imagine that it would be well worth while for the English manufacturers to consider the advisability of entering for this event.

The *Gazetta dello Sport* is organising a reliability trial from Milan to Naples (a distance of approximately five hundred miles) in May, while the Motor Cycle Club of Turin is organising a reliability trial, including a hill-climb over the Col de Sestriere.

Rejuvenated Ancients.

Spring is bringing out a remarkable collection of antiquities. On main roads in the Midlands machines of other days were to be seen taking the air. A Quadrant of approximately 1905 date was undergoing drastic ministrations to its interior, having failed to drag a sixteenth century sidecar up a 1 in 100 gradient. Strangest sight of all was a James of the "forks on one side only" variety going fairly well. Our hopes of seeing a Singer front wheel driven tri-cycle were disappointed.

No French Trials This Year.

The Automobile Club of France, which holds a somewhat similar position to the Motor Cycle Union of France as the R.A.C. to the A.C.U., has, we understand, publicly stated that there will be no French motor cycle trials this year, in view of the difficulties with which the French manufacturers find they have to contend, as regards materials and delivery.

It is pointed out, however, that there is nothing to prevent private individuals organising competitions among themselves, and those who may care to enter such competitions should look through the fixture lists of the Swiss and Italian clubs.

Fuel Union Rally.

A national "Victory" intermeet of the National Motor Cyclists' Fuel Union will take place on April 20th at Stratford-on-Avon. The organisers think that this "intermeet" will probably be the largest gathering of private-owner motor cyclists ever witnessed in this country.

We are advised that contingents of the N.M.C.F.U. from Portsmouth, Weymouth, Glasgow, Newcastle-on-Tyne, Sheffield, Manchester, Birmingham, Bristol, Coventry, Wolverhampton, Bedford, Nottingham, Leeds, Leicester, Lincoln, London, Derby, Liverpool, Barrow-in-Furness, Grantham, Rugby, and Ashby-de-la-Zouch are now completing arrangements for their run and attendance.

PURCHASING SECOND-HAND MOTOR CYCLES.

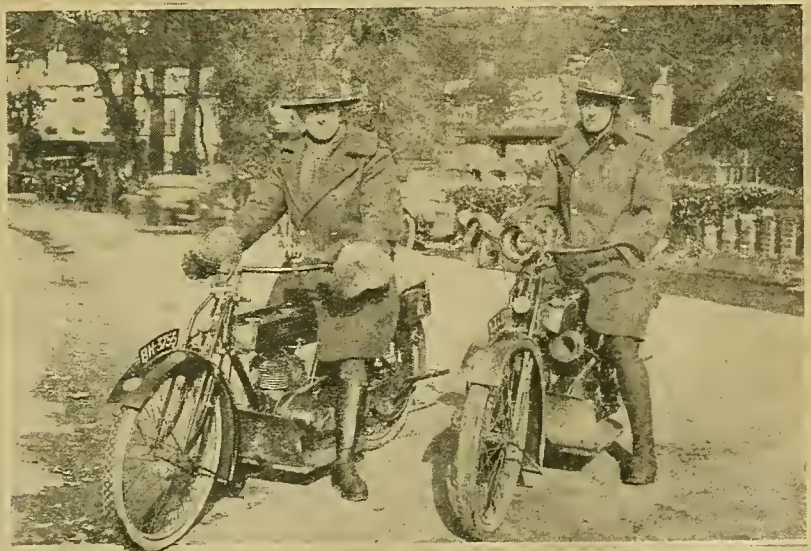
At this period of the year many used motor cycles change hands. Our readers are advised to exercise every care in purchasing second-hand machines, and to deal only with firms of high reputation, or, in the case of private advertisers unknown to them, to insist upon dealing through our Deposit System, which is designed to protect their interests, unless the machine can be tested before purchase. Dates of manufacture should be verified, when possible, by taking the engine and frame numbers and sending these to the makers. No firm or person whose methods are proved to be unsatisfactory is permitted to advertise in "The Motor Cycle."

Sidecars for Taxi Service.

There is a dearth of taxicabs in Paris, and, as a remedy, the French capital is to have a public service of sidecars. Probably the machines used by the American Army will be acquired and equipped with adjustable hoods for the protection of the passengers. The charges are to be 7½d. for the first kilometre (almost five-eighths of a mile) with 3d. a kilometre afterwards.

The National Benzole Co., Ltd.

We stated several weeks ago that a benzole distribution company was likely to be formed. This has now come about, the company (which has registered offices at 5, Gray's Inn Square, London, W.C.1) being capitalised at £300,000. All of this amount has been subscribed among the members of the National Benzole Association. It will be a pleasure to know that in the future the distribution of benzole will be greatly facilitated, and it will be as easily obtainable as petrol throughout the country.



At the Junior Car Club's rally at Burford Bridge last Saturday. Two New Zealand motor cyclists on 2½ h.p. "Maoris."



Nottingham and District M.C.C.

The opening run will take place on April 6th to Belvoir Castle. The start will be from the Market Place, Nottingham, at 2 p.m.

Wakefield and District M.C.C.

An opening run to Bolton Woods has been arranged for April 6th. Honorary secretary, Mr. H. E. Wood, White Horse Hotel, Westgate, Wakefield.

Oldham and District M.C.

The opening run of this club will be held on May 4th, when the members will go to Macclesfield and Jenkins Chapel. Honorary secretary, Mr. H. Wright, 134, Manchester Street, Oldham.

The Hall M.C.

The Hall M.C., started in connection with the Dartford Ironworks, of which membership is confined to members or employees of the firm of J. and E. Hall, Ltd., has at present about forty members. The opening run was to Wrotham and Sevenoaks on Saturday, March 29th. It is proposed to hold a paperchase in the near future. The club has been affiliated to the A.C.U.

Glasgow M.C.C.

At a meeting held in the Athenæum, Glasgow, it was decided to recommend the committee to promote competitions, and to endeavour to develop the social side of club life. Mr. John Gow was re-elected president, and the vice-presidents are Messrs. G. W. Orr, G. H. Cutbush, and J. S. Fulton. The new captain is Mr. W. Hood; vice-captain, Mr. G. Wilson; honorary secretary, Sgt. A. C. McMin.

Woolwich, Plumstead, and District M.C.

The fifty-mile non-stop trial on April 6th will start from the "Three Horse Shoes," Knockholt, Kent, at 10.30 a.m. Entrance fee should be sent to the hon. sec. before the day of the trial. The course will be down Star Hill to Dunton Green, along the main Hastings Road, through Sevenoaks to Lamberhurst. Hon. sec., F. J. Ellis, 3, Nightingale Place, Woolwich, S.E.18.

Bolton and District M.C.

The first three events of the season are purely social, beginning with a run on April 6th at 1.30 p.m. to Higher Hodder. On May 4th the first competitive event will be run off, in the shape of the ever-popular reliability trial, details of which, route, etc., will be announced later.

Any motorist or motor cyclist resident in Bolton and district who would like to take part in the social runs is invited.

Intending members should leave their names and subscriptions (5s. 6d.) with the hon. secretary, Mr. Jas. E. Whitaker, 205, St. George's Road, Bolton.

Future Events.

April 5.—Birmingham M.C.C. Opening Run to Stratford-on-Avon.

April 5.—Coventry and Warwickshire M.C. Opening Run.

April 5.—Cumberland County M.C.C. Special Meeting, Crown and Mitre Hotel, Carlisle, at 6.30 p.m.

April 5.—Essex Motor Club. Victory Dinner at Frascati's, Oxford St., W.

April 6.—Bolton and District M.C. Opening Run to Higher Hodder.

April 6.—Eastern Counties M.C. Opening Run to Harlow.

April 6.—The M.C.C. Opening Run to Hatfield.

April 6.—N.M.C.F.U., Coventry. Run to Badby Woods.

April 6.—Nottingham and District M.C.C. Opening Run to Belvoir Castle.

April 6.—Woolwich, Plumstead, and District M.C. Non-stop Trial from Knockholt to Lamberhurst and Back.

April 9.—Liverpool M.C. Annual Meeting, Law Association Rooms at 7.30 p.m.

April 9.—York and District M.C. Opening Run to Farndole.

April 11.—Carlyle C. and M.C.C. (Chelsea). Dance at Chelsea Town Hall.

April 12.—Public Schools M.C.C. Opening Run to Shere.

April 13.—Eastern Counties M.C. Run to Quendon.

April 13.—Essex M.C. Opening Run.

April 13.—Liverpool M.C. Opening Run.

April 19.—N.M.C.F.U. National Meet at Stratford-on-Avon.

April 21.—Birmingham M.C.C. Open Reliability Trial for Victory Cup.

April 21.—Dublin M.C.C. Dunlop Cup Trial.

April 26.—Public Schools M.C.C. Hill-climb.

May 4.—Bolton and District M.C. Reliability Trial.

May 4.—N.M.C.F.U., Sheffield. Reliability Run to Knutsford.

May 10.—The M.C.C. Speed-judging Competition.

May 21.—York and District M.C. Reliability Trial.

May 24.—Birmingham M.C.C. Social Touring Trial. Week-end to Llangollen.

August.—A.C.U. Six Days Reliability Trials.

N.M.C.F.U. (Coventry).

The Social Committee of the Coventry branch, N.M.C.F.U., has arranged an open run to Badby Woods on April 6th. Meet Pool Meadow at 2 p.m.

An Aldershot M.C.C.

Lt. M. C. Dudding, R.A.F., "Aston Villa," Ash Road, Aldershot, is desirous of getting into communication with motor cyclists in the Aldershot district, with a view to forming a club.

Harrogate and District M.C.C.

This club is holding its opening run on April 18th, and, as of old, the venue will be Richmond. The hon. secretary of the club is Mr. H. W. Fortune, St. James's Chambers, Harrogate.

Eastern Counties M.C.

The opening run and reunion of members will take place on April 6th, to the Bull and Horseshoes, near Harlow. Tea at 5 p.m. Active members, old and new, as well as prospective members (professional competition riders are not eligible), are particularly invited to take part. The following fixtures have been arranged: April 13th, Quendon; April 27th, Chelmsford. Hon. sec., Mr. J. W. Percival, 5, Ruby Road, Walthamstow.

The Motor Cycling Club.

The first event to be held this year by the M.C.C. is a speed-judging competition, which will take place on May 10th. A petrol consumption trial will be held in June.

The subscription of one guinea is now due, and no member can enter for the London-Edinburgh run, for which arrangements are now being made, unless his subscription has been paid.

The amount collected at the M.C.C. smoking concert for the St. Dunstan's Hostel was £32 odd. So far the club has been unable to find accommodation for the Easter tour. Hon. sec., Mr. Southcomb May, 15, Endsleigh Gardens, N.W.1.

Ystalyfera and Swansea Valley M.C.C.

It was decided at a meeting held in Ystalyfera on March 26th to restart this club forthwith. Appreciating that the need for unity amongst all motorists was never more urgent than at the present time, the club has decided on affiliation under the A.C.U. Division C scheme. The joint secretaries, Mr. T. P. Lewis, Gurnos, Ystalyfera, and Mr. Perkins, chemist, Ystalyfera, will be glad to hear from intending members. The annual subscription is 12s. 6d. The committee hope to run some interesting competitions during the summer. The captain is Capt. A. Lindsay, M.B. All motor cyclists in the district are cordially invited to join the club.

Rochester, Chatham, and District M.C.C.

A meeting will be held at eight o'clock to-night (Thursday) at the Royal Hotel, Rochester, to discuss the re-formation of the above club. An invitation is extended to all local motorists, including ladies. Honorary secretary, Mr. S. White, 3, South Avenue, Rochester.

Club News.—

Essex M.C.

The dinner arranged to be held at Frascati's Restaurant on Saturday, April 5th, will undoubtedly be a great success, nearly a hundred tickets having been disposed of.

The opening run arranged for April 13th will take place to the Green Man, Harlow, leaving headquarters, the Eagle, Snarebrook, at 11 a.m. Lunch will be provided at 3s. 6d. per head, and all members who propose attending should advise the captain, Mr. F. A. Applebee, at 208, Great Portland Street, W.

The committee have obtained the first refusal from the Southend Corporation to hold a race meeting upon the promenade, and, subject to sufficient support being promised, a meeting will be run during the summer.

Coventry and Warwickshire M.C.

At a general meeting held last Friday, this well-known Midland club was formally revived. Mr. V. A. Holroyd was in the chair. Mr. Edward Manville, M.P., was elected president. The committee consists of Messrs. V. A. Holroyd (chairman), W. F. Grew, Ambrose and David Elson, J. F. Spencer, W. H. Carson, A. Wright, S. Wright, F. Hulbert, G. E. Roberts, M. W. Danks, and Capt. Geoffrey Smith and M. Sampson. Mr. Arthur Wright, after a detailed statement concerning the club's financial position, which is very good, was re-elected hon. treasurer, and Capt. Maurice Sampson hon. secretary.

Many new members were proposed. The club will be more of a social character than the majority, and a provisional programme which has been drawn up includes an Easter Monday run to Malvern, a long-distance trial for fifty-guinea cup in May, Whitsuntide run, M.C.C. team trial, and a picnic in June. Interested motor cyclists and other motorists should apply for membership application forms from the hon. secretary at 19, Hertford Street, Coventry. The annual subscription is now 10s., and the first fifty new members enrolled will not be asked to pay the 5s. entrance fee.

The Junior Car Club (formerly the Cyclecar Club).

The chief item of business at the annual general meeting of the Cyclecar Club was the substitution of the name, the Junior Car Club, for the original title, concerning which the hon. secretary said a few words. He spoke of the difficulty of restarting the club under its old name, when the cycle car was practically dead. It was hoped that the R.A.C. would give the club control of the light car movement, and the title Junior Automobile Club had been suggested—a corporate body which offered the right to the Cyclecar Club to absorb itself in this body and adopt the title for a moderate fee. The R.A.C., however, did not see its way to grant the privilege asked for, and it then remained for the club either to go on its own lines and attempt to control the movement or join hands with the R.A.C. and get control eventually. It was decided, however, not to go against the R.A.C., and a satisfactory interview had been obtained with Mr. Julian Orde and the late Mr. Robert Todd, who promised

that a Light Car Committee would be founded on which there would be representatives of the Cyclecar Club. Mr. Orde had also promised that the Junior Car Club, when constituted, should be affiliated, and he would ask those members of the R.A.C. interested in the light car movement to serve on the Light Car Committee.

The following members were elected on the committee: Maj. Oates, Capt. Colver, Messrs. E. C. C. Starr, Stead, Westall, Burroughs, Nash, Boileau, Noble, Adamson, de Peyrecave, and Higgs.

Mr. Starr offered to present a cup for the committee to use in such a manner as to increase the membership of the Junior Car Club, which offer was accepted with grateful thanks.

Birmingham M.C.C.

Arrangements are now complete for the open reliability trial on Easter Monday.

Hon. sec., W. H. Egginton, 76, Earlsbury Gardens, Birchfields, Birmingham.

The B.M.C.C. is catering for the touring motor cyclist on such a scale as has seldom been attempted by clubs in the past. Apart from the usual awards to be won in members' competitions, the Austin Cup will be awarded to the member who gains most marks in members' competitions during the season.

The social touring fixtures embrace half-day, whole-day, and week-end tours to popular resorts. Some of these will be picnic tours. These tours should provide a means of enjoyment that is denied to the single individual. To encourage members to turn out regularly, marks will be awarded for each attendance, and special prizes awarded to the members who have the most marks at the end of the season.

A photographic competition will be coupled with the social tours and club competitions, and prizes awarded for the best set of pictures taken this year.

Marking for attendance will commence on May 1st.

N.M.C.F.U. National Meet.

The national meet will take place at Stratford-on-Avon on the 20th inst. A good programme is being arranged, and all members wishing for accommodation should write *at once*, stating length of stay, etc., to the organisers. Mr. F. Murray, "Strathmore," Wharfedale Road, Acock's Green, Birmingham, or Mr. T. Mallalieu, 32, King Richard Street, Coventry, who will endeavour to arrange for their requirements.

The Public Schools M.C.C.

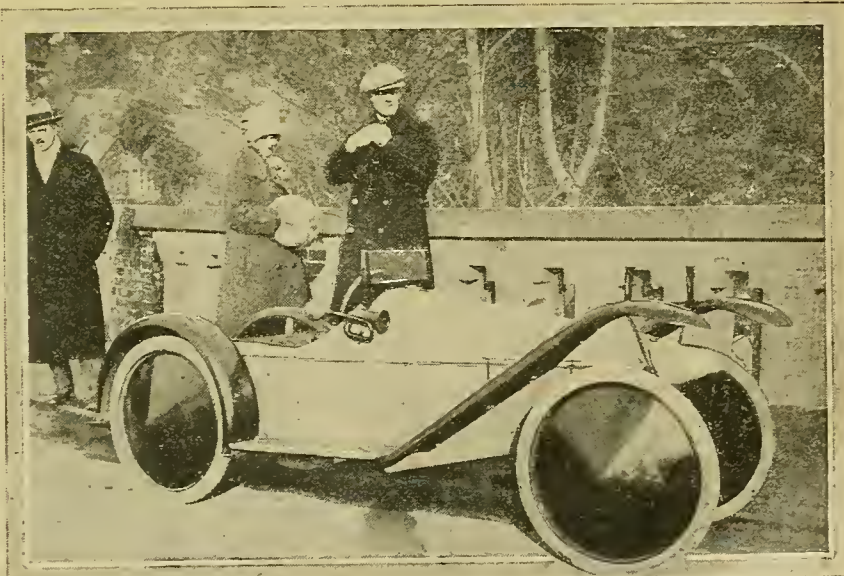
The P.S.M.C.C. has now been revived. A general meeting was held at the R.A.C. on Wednesday last under the chairmanship of Mr. E. M. P. Boileau, a committee was elected, and a preliminary programme was drawn up.

The Chairman, in opening the meeting, referred to the former prosperity of the club up to the time of the war, and the great sacrifice made by many of its members, and thanked Mr. Browning for his services in acting as temporary hon. sec. during the last few months.

The committee was then elected, which consists of the chairman, Mr. E. M. P. Boileau, vice-chairman, Col. F. S. Brereton, Major, B. C. Barton, Messrs. A. J. Luce, L. P. Openshaw, Capt. M. G. W. Burton, Messrs. T. W. Loughborough, L. M. Meyrick-Jones, C. B. Winter-Lotimer, G. W. Bonham-Carter, S. H. Davis, C. Wright (hon. treasurer), and H. B. Browning (hon. sec.).

The programme for 1919 consists, up to the present, of an opening run, members meeting at the Bear, Esher, on April 12th, at 2.30 p.m., and a stop for tea will be made at Shere. It was decided to hold a hill-climb on April 26th, and later on to hold a week-end "touch-nothing" competition.

In the course of the meeting Mr. Browning (hon. sec.) was instructed to invite present members of public schools to act as representatives of the P.S.M.C.C. in every school. The hon. sec.'s address is Riverbank, Staines.



A Carden monocar at the Junior Car Club's meet last Saturday. For competition purposes this little machine is now classed as a car.

The Future of Motor Cycle Competitions.

Three Kinds of Competitions and Three Reasons Therefor.

By T. W. LOUGHBOROUGH, A.M.I.A.E. (Secretary of the Auto Cycle Union).

THE fact that pedal cycle racing has lost its old grip on the public and is now confined to a comparatively small, if enthusiastic, circle has led some dim-sighted critics to foretell a similar fate for motor cycling competitions. If the motor cycle had reached the same finality in design as the push cycle of ten or even fifteen years ago, there would have been some excuse for such forebodings. Even so, there could be no comparison between the two forms of sport. The combination of skill and nerve on the part of the rider, the perfect "tune" of the machine, the pure physical joy of speed and power that in a car becomes impersonal, and in the air is lost altogether, puts motor cycle racing in a class by itself, and will keep it there.

But racing *qua* racing or hill-climbing against the watch, fascinating as it undoubtedly is, is now, and will be for many years, the least of the three main reasons why competitions should be encouraged. The private entrant—strange blend of sportsman and mechanic, to whom speed and speed alone appeals—must, until the motor cycling millennium, be prepared to take second place to the trade rider, and to be penalised in reliability trials for checking in ahead of schedule. To the manufacturer, competitions appeal as opportunities for demonstrating the excellence of his wares, as advertisements of reliability and efficiency. Whilst to the third of the parties interested, those whose text is "the encouragement of the sport and pastime of motor cycling," the outstanding object is the improvement of the breed.

Three Reasons for Competitions.

Thus there are the three underlying reasons for motor cycling competitions—first as an incentive to progress, secondly as a demonstration of excellence already reached, and, thirdly, to provide one of the best forms of modern sport and relaxation. Every sort of competition from the T.T. to the least important club fixture can satisfy all these three requirements more or less.

In "blue riband" events, such as the T.T. and the Six Days, it is the duty of the Competitions Committee of the Auto Cycle Union so to frame their conditions as to provide such a spur to progress that the most lethargic of manufacturers must realise that a reputation made needs keeping. And that I submit is the reason why in 1912 the Auto Cycle Union was fully justified in promoting a race against the wishes of the majority of the trade, and, again, it explains why the proposal to confine such competitions to stock machines does not find favour with the controlling body. The more important open events organised by such clubs as, for example, those of Birmingham, Liverpool, or Bristol, or the Motor Cycling Club, are the golden opportunities for trade advertisement of current models. The more such competitions are

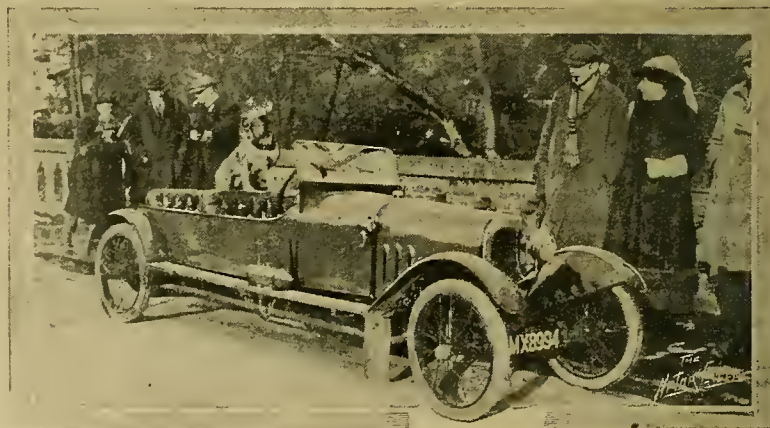
supported by the trade the better for everybody concerned, and not least, the motor cycle public. And, finally, we have the "closed" club competitions, where the sporting spirit should predominate, and where trade support in any shape or form may do more harm than good.

Three Classes of Competition.

In all three classes of competition the private sportsman has his chance. In the club events he should have the field to himself—in open events he should be able to win his gold, and in the Isle of Man a sporting chance must always be given him. He must be encouraged, for when motor cycles reach such a state of perfection that no further progress appears possible—if that can ever be!—then we shall look to the private rider to fill the entry list of the T.T. And in the meantime the trade should remember that just as the war has provided such a demonstration of utility that to-day manufacturers cannot cope with the demand, so when the factories get into full swing and immediate wants are satisfied, further demonstrations will be needed to keep the order book full. Therefore I hope to see during the coming summer a goodly number of open club events all really well patronised by the trade.

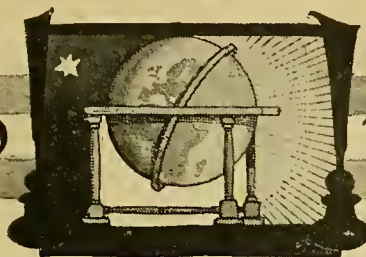
The Six Days Trial.

There will be no T.T. this year. The Union realises that production is the main requirement to-day, and that manufacturers cannot in fairness be asked at the present time to devote the time to experimental work that such an event calls for. On the other hand, to continue to concentrate on production alone means stagnation in design, and so in the autumn I look to the Six Days Trial to cover with laurels those who have seen beyond the requirements of the current year, and I trust that, owing to successful participation in this important trial, more than one 1920 model will have something more to its credit, and a stronger appeal to the public, than a mere place in the 1919 show.



A 1919 G.N. at the Junior Car Club's rally at Burford Bridge last Saturday.

LETTERS TO



THE EDITOR

The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Herford Street, Coventry, and must be accompanied by the writer's name and address.

IS A T.T. RACE POSSIBLE?

Sir,—I have read the letter in *The Motor Cycle* of March 13th, signed Vivian Olsson, with great interest. Having served for three and a half years of the war in France with the Mechanical Transport, I should like to state that, should a race for amateurs be arranged, as suggested by Mr. Olsson, in my opinion it would meet with the greatest possible success with ex-D.R.'s, etc., and I should like to put my name down as a competitor in the Senior race.

R. WHITE (Capt.).

PULLEY GRIP.

Sir,—I was much interested in "Graduate's" letter on the Grado pulley. Although it has often been stated that the belt pulls into highest gear, this is not borne out in practice. If it were, the makers would fit the ball thrust washer between the control rod and pulley, and not, as is the case, between the sliding flange and thrust collar.

I have nothing but praise for the pulley in use, except the harsh action on belts.

Has anyone experience of Whittle with the Grado? If so, I should like to hear how it works.

R. L. BOYD.

UNNECESSARY RESTRICTIONS.

Sir,—We beg to call your attention to the serious inconvenience of not being able to send a complete motor cycle by passenger train that is over 112 lb. in weight. We cannot see the necessity for such a restriction as this remaining in force now that the war is over, and we think the matter should be taken up, because at present it is necessary to detach certain parts from the machine to get down to the required weight, and if the machine is sent by goods-train it generally takes a considerable time.

S. A. NEWMAN, LTD.

GROUND CLEARANCE.

Sir,—I read with much interest the article on Mr. R. G. Baird's machine in your publication of March 13th. As you say, it is carefully thought out. There is, however, one point which struck me rather forcibly in the design, namely, that of ground clearance.

The ground clearance is given as $3\frac{5}{8}$ in., and we are told 700×85 mm. tyres are fitted. Now 85 mm. is just over $3\frac{1}{4}$ in., and I judge that with one tyre flat the ground clearance would be about $1\frac{1}{2}$ in.—not more.

It makes me shudder to think of the consequences to the crank case and engine (to say nothing of the rider) of a burst on a road with a surface such as is encountered nowadays.

B.E.F.

R. H. CHAPLIN, SEC.-LT. R.E.

POWER REQUIRED FOR SIDECARS.

Sir,—We note in your report of a paper read before the I.A.E. on "Engines for Sidecar Motor Cycles," by Mr. Eric Caudwell, a striking paragraph, which runs as follows:

"Only engines of over 500 c.c. piston displacement were dealt with, as with volumetric efficiencies at present attained a smaller engine was considered quite unsuitable for serious sidecar work."

To this sentiment we desire to demur in the strongest possible manner, though we should have been prepared to agree had the phrase been "in the past" rather than "at present."

Mr. Caudwell is evidently unaware that certain motor cycle designers have made considerable progress in the saving of weight and in the attainment of high brake horse-power from engines of small capacity. The A.B.C. engine has a capacity of 400 c.c., and, because it has a really good volumetric efficiency, it will take a sidecar anywhere. But the

A.B.C. combination, with *personnel* of the average bulk, will not weigh the 700 lb. Mr. Caudwell quotes; it will rather be in the neighbourhood of 500 lb. We do not wonder that some designers demand a sidecar engine of 1,000 c.c., for if they want to carry a couple of hundred pounds of useless weight about they will require more power for this purpose.

But we would remind Mr. Caudwell that weight does not mean power, any more than big cubic capacity means power. Horse-power is determined by engine dimension, r.p.m., and mean effective pressure. By increasing the value of the two latter components we have been able to reduce that of the former to a very notable extent, and this, we are satisfied, is the only direction in which true progress can be made. We claim that in the A.B.C. sidecar combination the ratio of total weight, divided by weight of passengers, is lower than in any other combination of similar hill-climbing and speed capability.

THE SOPWITH AVIATION CO., LTD.

ALAN R. FENN, Sales Manager.

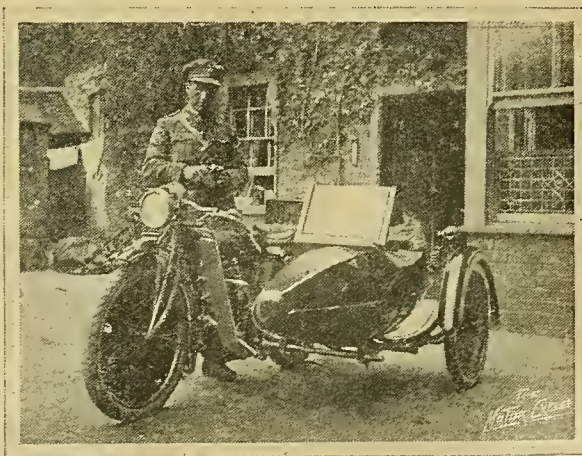
A TABLOID HISTORY OF AIR-COOLING.

Sir,—“Road Rider” is right when he maintains that a rotary engine is the most wasteful of all types with petrol and oil. The Gnome Monosoupape was a very remarkable engine as engines went in those days, but its very low weight for power ratio hardly compensated, at any rate as far as ordinary engineering utility went, for the very marked disadvantages that went with it, the chief being heavy fuel and oil consumption and liability to fire. For aero work, the fact that it was, in its lightest form (with no variable timing), uncontrollable did not matter very much.

The Gnome types of rotary must, in the light of later design, be regarded as “back numbers,” and it yet remains to be proved that the more improved types, the Le Rhône, Clerget, Canton-Unne, Bentley, etc., can really favourably compare with the latest radials for fast scout work.

“Road Rider’s” point about the dead work performed by rotaries in overcoming their own air resistance is not altogether tenable. It must be remembered that the “flywheel effect” is considerable.

REVS.



Capt. C. T. Newsome, R.A.S.C., who before the war was a successful competition rider on a Rover motor cycle. In future his activities will be in the car world.

VALVE POSITION.

Sir,—I have read very tempting descriptions of several new motor bicycles in your paper lately, yet all but the vertical cylindered ones seem to have horizontally acting valves or inclined ones.

I have been a motorist for seventeen years, though a motor cyclist for only about six. I want a multi-cylinder machine, but I fight shy of valves arranged as above. I consider two cylinders enough, though might go in for a four, if not more than $3\frac{1}{2}$ h.p., not too heavy, nor the engine too much like a toy.

W. REGINALD WILSON (M.A., M.B.B.C. Cantab.).

FROZEN OIL.

Sir,—Referring to Mr. J. Simpson's letter on page 283, of your issue of March 29th. He asks what objections there could possibly be to placing the oil tank at the back of the cylinder. The answer, of course, appears on page 268 of the same number, illustration 4, which shows the oil tank on seat tube of the Rudge Multi, the oil pump of which is worked by Bowden mechanism actuated by the pedal close to the right footrest. In addition to giving a more sheltered position for the oil tank, the rider's hands are never soiled as in working a hand pump, and the top tank holds petrol to its full capacity, and keeps much cleaner than when an oil tank is combined with it.

RUDGE-WHITWORTH, LTD.

Sir,—With reference to your correspondent's letter over signature of J. Simpson, this conveys to my mind the inadvisability of using the so-called air-cooled motor oil at all. Can any of your expert correspondents enlighten me on the subject? As far as I can see, the greatest desideratum in internal combustion engine lubrication is that the oil should maintain its body at a high temperature—in other words, to have a good high viscosity. Why should an oil have to be thick to lubricate efficiently, as on application of heat it undoubtedly is reduced to a very liquid state. I had the same trouble as your correspondent, and experimented with a high-class brand of water-cooled motor oil. I may say I have used this with perfect satisfaction on an Indian, O.K. Junior, and at the present time I am using it and nothing else on a 4 h.p. Douglas combination and a $2\frac{1}{2}$ h.p. Levis. My wife, who is an enthusiastic rider of a lady's model O.K., uses the same oil, and I find I am getting just as efficient lubrication as I got with a so-called air-cooled motor oil. Some makers claim that their air-cooled oils have a good cold test, but I have yet to find an air-cooled oil that does not congeal in winter.

F. TAYLER.

REAR LIGHTS ON CYCLES.

Sir,—I am glad to see you grant Mr. Cooke space to air his opinions upon this question, but regret the push-cycling press does not do likewise with those who write antagonistic to their views, as I know from personal experience.

Your correspondent mentions that motor cyclists ought to be thankful to the National Cyclists' Union for taking up the cudgels for them. So far, so good; but we do not desire to be associated with a class of road users whose squeal like Germans at any little thing which they think will be a trouble or expense and place no value upon the general utility of the thing. During the war, when all head lighting was reduced, their agitation against rear lights was quite as rabid as now, and their press was so full of the subject that it seemed to exclude all cycling news, and became a laughable production upon rear lights and wastage of oil. Another much aired grievance of theirs was that no extra food was allowed a cyclist when on the road, as they claimed their pastime made them more hungry than other people who did not cycle. Your readers can judge for themselves the class of agitator behind all this, and will refuse to associate with such bad "sports" in any petition they get up.

Cyclists ride a machine which is not taxed in any shape or form, and has but one obligation placed upon it, and that as to lighting, yet they fuss and fume and pester the Home Secretary about their "grievances," whilst the motorist is taxed all round, was restricted in or entirely barred from his petrol during the greater part of the war, has had to carry a rear light for umpteen years, is told he must carry two brakes, and have number plates fore and aft, and illuminate them at night, yet, being a "sport," carries on with a good grace; but what a comparison he makes with the spoilt-child cyclist.

CORPORAL ELSIE.

THE THREE-JET BINKS CARBURETTER.

Sir,—With reference to the recent correspondence appearing in your pages regarding the three-jet Binks carburetter, it will probably interest some of your readers to know that getting rid of the blind spot between the second pilot and the main jet is merely a matter of adjustment.

On a Norton 4 h.p. motor cycle (633 c.c.), driven solo with No. 2 spirit, the combination 00, 3, and 8 answers very well, and for heavy sidecar work Nos. 00 or 0, 4, and 10 were fitted.

Widely varying grades of spirit or extreme ranges in atmospheric conditions call for a different setting. The above figures are the results of a series of experiments carried out during the past month, and are given for what they are worth. I might add that the petrol consumption figures were very good, showing a decrease of over 15% when compared with the best of three other instruments tested.

D. R. O'DONOVAN.

AIDS TO STARTING.

Sir,—I agree with "Tired Tim" in every remark he makes about difficult starting. My 'bus is a little $2\frac{1}{2}$ h.p. Hobart-Villiers two-stroke, single gear $5\frac{1}{2}$ to 1, and I have to get up early every morning to go to business on it. My usual procedure is to give the engine a fountain-pen filler full of petrol (?) in the sparking plug hole, and another in the Amac carburetter air intake, with both valves wide open, flood the carburetter freely, air valve closed, throttle half-way open. The engine will usually start in about three pulls of the back wheel, and when it has run warm will usually start fairly easily on the road.

Before I thought of putting juice in the crank case *via* the carburetter intake, I used to run for about one hundred yards before the engine took it into its head to fire at all, and then it used to blow back into the carburetter as soon as my weight landed on it.

In conclusion, I might add that the Hobart is a lovely little 'bus, and was perfectly satisfactory when I used Pratt's No. 1. The usual disclaimer.

Roker.

WEARY WILLIE.

ELECTRIC LIGHTING BY DRY BATTERY.

Sir,—In your issue of March 20th and several recent numbers of *The Motor Cycle* I have noticed the question of lighting solo machines with dry batteries and secondary cells.

The great possibilities of the Edison nickel iron alkaline cell, as a secondary cell, have not yet, to my knowledge, been mentioned.

Its advantages over the ordinary lead cell (with some disadvantages and remarks) may be of interest, and are roughly as follows:

ADVANTAGES.

(1.) *Strength*.—Capable of very rough handling, knocking, vibration, etc.; the case, or container, being made of nickel steel (instead of celluloid). Obviously, mechanical strength and rigidity result. "Active" material in plates less liable to come away and short circuit.

(2.) *Discharge and Charge*.—Very much higher rate of discharge: can be short circuited without damage. Can be discharged until voltage disappears—range of d.p. 1.5—0.9 volt (ordinary conditions), usual working voltage 1.2 volts (per single cell). Not damaged by being overcharged. May be left undischarged for a long time without damage.

(3.) *Longer Life: Maintenance*.—Outlast two or more lead cells. Much less attention required. No corrosive spray given off; hence no terminal corrosion.

DISADVANTAGES.

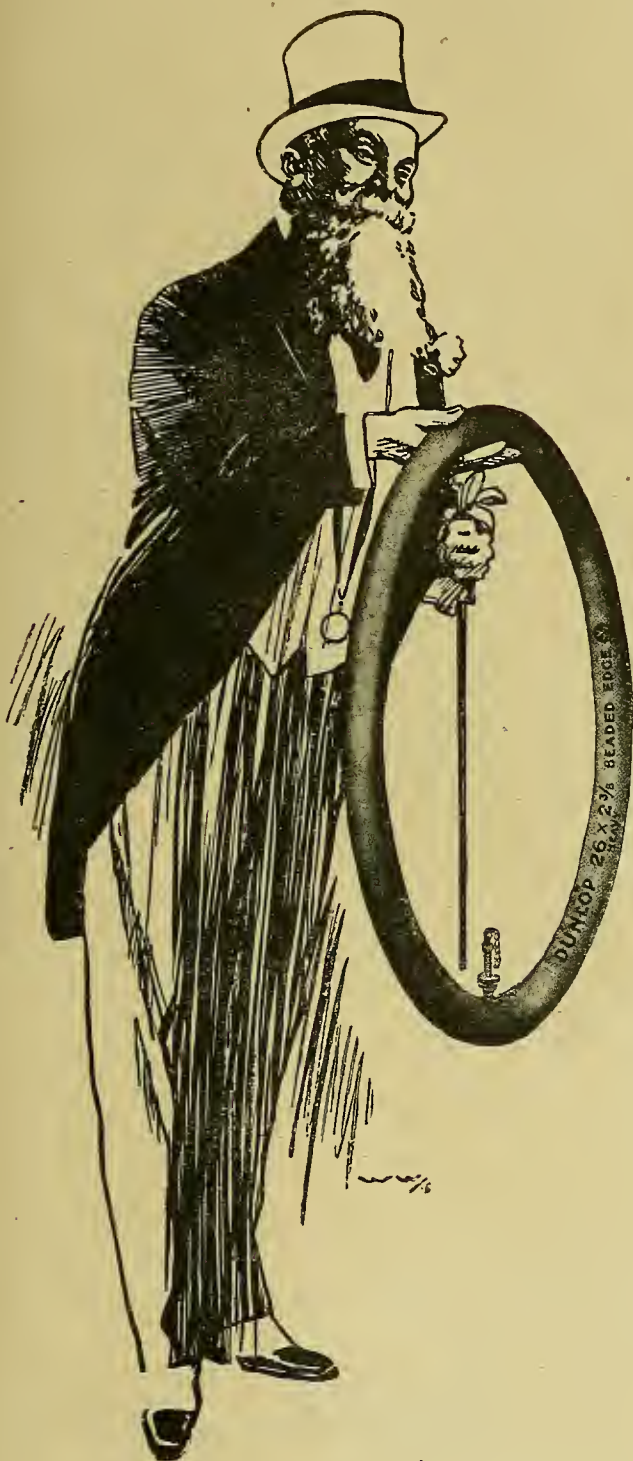
- (1.) Costs more: outweighed by advantage 3.
- (2.) Less efficient (electrically).

REMARKS.—Weight of each type almost the same. Eight watt-hours per lb. weight: complete cell for 30 amp.-hour cell. War stopped development in Great Britain and abroad, generally, it being an American product.

From the foregoing, the Edison cell would appear to be greatly advantageous for motor cycle use, where excessive vibration, rough handling, and neglect, play havoc with the ordinary lead secondary cell; as some have had the misfortune to experience.

In conclusion, I should mention I have no interest or connection with the Edison Company.

G.P.G.K.



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Get Dunlop motor cycle tubes in your covers—they're moulded to the exact shape of the outer cover: each size is a perfect fit and each tube of accurate section size.

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Endless	8/9	10/3	11/9
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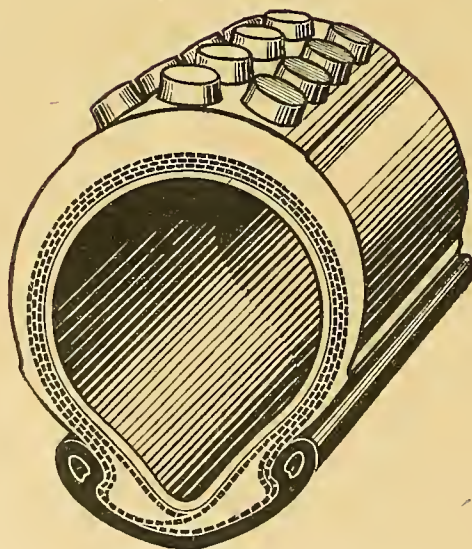
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26 x 2½	34 0	45 0	53 6



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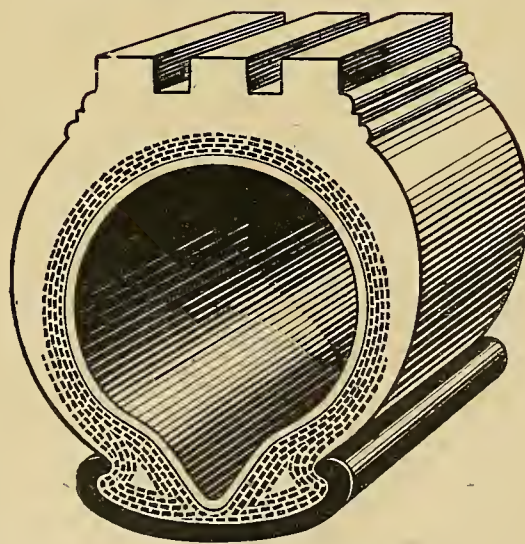
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In answering this advertisement it is desirable to mention "The Motor Cycle."



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The exhilaration of movement—rapid, smooth and long-sustained: that confidence sound workmanship alone entitles you to put in your mount; the miles fly by joyously, your whole enjoyment is unspoilt by trouble of any sort—for you're on a Norton.

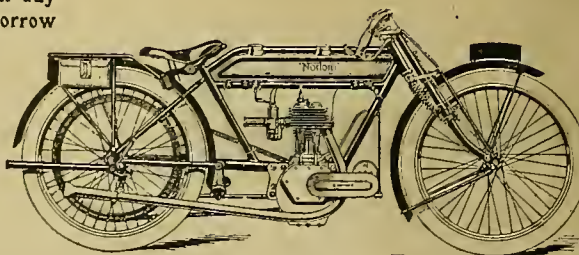
And it's day in and day out with the Norton. Each day a Norton is as good a friend as the last, and to-morrow you'll find her just as eager and just as true.

Norton Motors Ltd.

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LOSING ONE'S PROP.

Sir,—“Revs.” ignores two not uncommon causes of a lost prop, i.e., a minor engine derangement in flight or a partial stoppage of the pilot jet. His letter puzzles me, as most aero carburettors are fitted with adjustments at the throttle stop. Mere wear on the stop could hardly escape notice during the most casual engine tests before a flight.

As regards restarting an engine by diving, every make of stationary engine can be restarted in this manner if fitted to an aeroplane which can safely be dived at the requisite speed. The Rolls-Royce, being a geared engine, requires an unusually steep dive, and is mainly fitted to big machines which are not normally nose-dived. But if “Revs.” can get hold of a safe machine fitted with this engine and cares to satisfy himself by an actual test, I will send a very handsome wreath to his funeral if the engine does not start after, say, a 300ft. dive at 100 m.p.h.

TORQUE.

Sir,—Having read with interest the letters of your correspondents “Torque” and “Revs” on the above subject, I would ask “Revs” what he really means by “losing his prop.” Does he mean while in the air or on the water?

I have had considerable experience with all makes of engines, both rotary and stationary, on seaplanes, and have never seen a propeller stop rotating whilst the machine is in the air, unless the engine seizes, and then the propeller-shaft generally breaks; but pilots very often lose their prop on the water, especially while training.

I agree with “Torque,” and should like convincing proof of any service engine, stationary or rotary, that will not restart by diving. As to prevent the engine restarting, provided everything was in order, the prop would have to stop, and the “air friction” is certainly not insufficient to turn the engine over against the compression, or the “propeller slip” would be too great to drive the machine forward when the engine was running; one might as well say the “friction” between the road and wheels of a car coasting downhill with the engine switched off was going to be insufficient to restart the engine when the bottom of the hill was reached.

AIRMICK.

Oundle.

THE ADVANTAGES OF A TWO-STROKE.

Sir,—I was not in the least surprised to see that two correspondents have evinced great interest, and, it must be admitted a certain amount of thinly-veiled scepticism at Mr. F. W. Varney's account of the performances of his Levis. When first I read his letter, I, too, felt inclined to write it off as “hot air,” but, on consideration, I came to the conclusion that he did not use the term “average speed” in its usual and technical sense. I feel sure he meant that if one took the average of his *maximum* speeds they would work out at 35 and 45 m.p.h. respectively. And I feel it is only just to him to point this out to your readers. Nevertheless, I feel that he would be wise to publish the data from the diary or record he has kept, to prove to the unbelievers that what he says is true. I envy him his machine.

My last mount, a 2½ h.p. T.D.C. Wolf, had a top speed of 40 m.p.h., and once, by driving it in a brutal manner, I covered the twenty-nine miles from Lancaster to Windermere in fifty-eight minutes. I generally found that on a long run I could average 20 m.p.h. with careful driving in towns and hustling in the country. This is what makes me feel sure that Mr. Varney means what I suggest and not what he says.

With regard to his hill-climbing feats, I must confess that they take my breath away. I suppose there is no likelihood of his mistaking his hills. I once thought I had climbed “Rest and be Thankful,” but found out afterwards that I was not within five miles of it.

I feel that Mr. Varney owes it to himself to give us fuller details, and that he would confer a great benefit on the motor cycling confraternity if he would explain “how he does it.”

(REV.) M. P. SARGENT.

Sir,—With reference to the letter from “Enquirer,” published in *The Motor Cycle* of February 20th.

I run a 1915 two-stroke Clyno two-speed with Henderson model A featherweight coachbuilt sidecar, which has given every satisfaction during the past three years, and is still running well.

Owing to petrol restrictions and military duties, I have only covered about 6,000 miles with this outfit. During this mileage the replacements have been one new tyre (a 2½in.

being substituted for the 2in. on bicycle rear wheel) and one new belt, which are still in good condition, and two or three washers for inlet and exhaust ports. No replacements have so far been made to the engine, although cost of replacement parts for this type of engine is quite small.

A speed of 25 m.p.h. can be comfortably maintained, except on stiff hills, when 18 m.p.h. can be attained on low gear. I have travelled from London to Margate, Dover, Folkestone, Hastings, etc., and also various parts of Essex, and have not come across a hill that cannot be climbed with this outfit. Of course, freak hills are not attempted.

My weight is about twelve stone and passenger nine stone. Petrol consumption about 80 m.p.g., and plenty of oil is used.

There are many advantages in this type of combination to the man who is content to maintain the legal speed limit, and exercise reasonable care in driving, especially when turning corners. The engine is very simple, first cost comparatively small, tyre mileage good, and the machine is easy to start; the petrol consumption is, however, rather high, although my 80 m.p.g. could no doubt be improved, but with a loss of power, by fitting a smaller jet (I use a No. 30 Senspray).

The engine is decarbonised about every 700 to 1,000 miles, and this is quite a simple operation, which can be carried out in a couple of hours.

In conclusion, the Clyno two-stroke is an ideal machine for this purpose, as it is sturdily built and is fitted with an efficient two-speed gear and hand-controlled clutch.

Leytonstone.

CLYNO TWO-STROKE.

MOTOR CYCLES FOR THE MAIMED.

Sir,—I was interested a few weeks ago to see a correspondent enquiring what machines were suitable for a rider who had lost his right leg, and a reader's reply mentioning certain machines which had the foot brake operated by the left foot, and might, therefore, be considered suitable. This, I am afraid, is not entirely the case. Having ridden, with an artificial limb, various makes of motor cycles for some years, I should like to give a word of warning.

Used with a sidecar, any machine which has the foot brake on the side of the sound leg and a hand-controlled clutch is, of course, quite suitable and safe, and one's disability makes no difference at all. Riding solo, however, is a different matter. In case of an emergency, when one must stop all headway instantly—as, for instance, if a child rushes into the road or something emerges suddenly from a side road—one is placed at a severe disadvantage, for the reason that the sound leg must be placed on the road to hold up the machine, thus leaving the front brake only for use. Suddenly applied at speed, this is bound to cause a bad swerve at least, and a certain spill on a greasy road. Almost worse still, on some machines, the front brake is no use at all, being little more than an ordinary push cycle brake.

The remedy consists in fitting auxiliary hand control to the rear brake. A strong lever, with big leverage and heavy Bowden cable, should be fitted close to the exhaust lift, so that both levers can be gripped at once, thus shutting off the engine and applying the back brake at the same time, leaving the other hand free to apply the front brake, de-clutch, or throttle down as requisite, also leaving the sound leg free to hold up rider and machine if necessary. The foot brake should be left *in situ* for normal use and holding the machine down long hills.

In conclusion, I would like to say that the P. and M. and Enfield, both fine machines, are ideal for riders who have lost the use of the left leg.

H. D. LEE.

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The recognised standard text book of the motor cycle: deals with all types of machines and with every part of the machine. 400 illustrations
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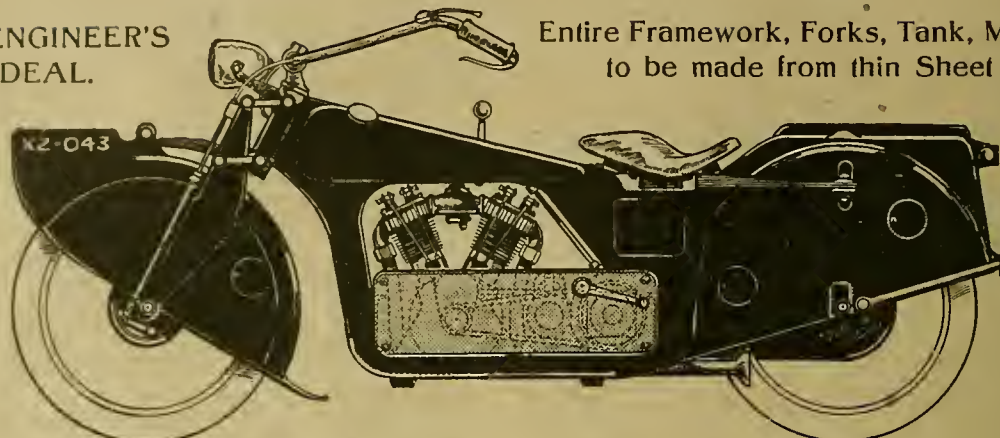
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A 1921 MACHINE DE LUXE.

AN ENGINEER'S
IDEAL.

Entire Framework, Forks, Tank, Mudguards,
to be made from thin Sheet Steel.



A proposed design for an all-weather machine. The complete unit and gear assembly is mounted in a sub-frame in the centre of the frame, which can be withdrawn to facilitate overhauling.

EVERY motor cyclist has his ideal, which usually is a composite comprising the best features of the many machines he has tried and seen. The motor cycle illustrated on this page is quite another proposition, and while being frankly ideal it is intended to be a suggestion for the Rolls-Royce type of machine to which many contributors have referred from time to time.

Some of the features of the design are not entirely original, but since they offer many advantages over present-day methods they are incorporated in a general design as indispensable in the writer's opinion, if the outstanding faults of the average motor cycle are to be overcome. This refers particularly to the present type of tubular frame, which involves the most awkward construction possible in the attachment and accommodation of all the sundry parts of a machine, the inaccessibility of the engine and transmission, and the difficulty of cleaning a machine in a rapid and satisfactory manner.

The general design of the proposed machine may be summarised in the following:

Frame.

The entire framework, including forks, petrol tank, mudguards, valances, carrier, tool and accumulator boxes, is made up from thin sheet steel stampings and welded together with flush joints wherever possible. By this form of construction, a strong box-like framework can be utilised in the central section of the machine around the power unit where the greatest strength is required, with the corners rounded off everywhere to give an easy surface for cleaning purposes. The gauge of the sheet metal throughout should be graduated according to the stresses set up in the main frame under running conditions, but in all other places the metal could be reduced in gauge to cut down weight. It is not suggested that this type of frame

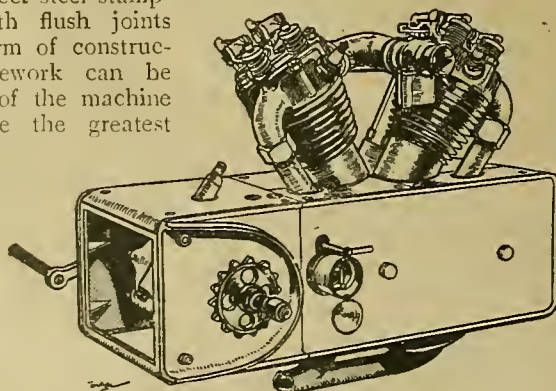
would be lighter than the standard tubular pattern—on the contrary, it may be slightly heavier; but the immense advantages gained by the pressed steel frame outweigh such a minor objection. The tubular frame was discarded years ago for pressed steel construction in automobile chassis, yet, the writer contends, we still cling to old methods in motor cycle manufacture.

Sub-frame for Power Unit.

In the sketch of the proposed frame, a completely unobstructed opening is arranged in the centre for the reception of the engine and gear unit, which is an entirely separate assembly in a sub-frame of its own. The front forks, mudguard, side valances and number plate are built up as a complete unit in sheet steel, the only tubular construction used in this locality being the actual steering head itself. For front suspension, a single semi-elliptic leaf spring is suggested, with adjustable ball bearing links between the main frame and forks.

Sheet metal construction of the main frame is extended right to the rear in order to accommodate a suggested form of rear spring suspension for the rear wheel and to provide automatically a carrier and mudguard with side valances as well. In this case, the portions of the rear section of the main frame which require extra strength could be stamped out of fairly thick metal, whilst such pieces as the valances, etc., which perform merely light duties, need only be built up in thin sheet steel and welded in position with flush joints.

The suggested springing of the rear wheel is shown in the drawing. If the spindle of the wheel is bolted to a vertical loop working in slides in the frame and anchored in a slot at the top, the wheel cannot move in any other than a vertical direction. At the same time, the



Suggested mounting of the power unit and gear assembly in an enclosed aluminium sub-frame. The position of the magneto contact-breaker will be noted.

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The 1921 Machine de Luxe.—

box construction of the rear section of the frame should, provided it is suitably strengthened laterally by cross ribs or plates, prevent attempted side oscillation of the rear wheel whilst on a bad road with a heavy sidecar. A long semi-elliptic spring anchored at the front end on either side of the frame should provide for comfortable suspension, whilst the rear extremities of the springs are supported on extensions from the vertical loop connected to the rear wheel inside the frame and valances.

Engine and Gear Unit.

A 6 h.p. V twin is the power unit most favoured by the writer. It is a type that has proved itself capable of pulling healthily, and one that develops no mysterious troubles. This refers more especially to sidecar work when an engine with proved stamina and power is inevitably required. The engine incorporated in this design would have such features as overhead valves, detachable heads, outside flywheel, balanced crankshaft, cast iron cylinders, and aluminium pistons: the capacity of the engine being in the neighbourhood of 800 c.c. Long stroke and moderately low compression would be adopted to ensure flexibility on top gear, the maximum of efficiency being sacrificed to gain cool and tractable running.

The lubrication of the engine should be entirely automatic with the whole of the oil carried in the sump. The system whereby a small gear pump in the base of the crank case feeds oil direct through a nozzle on to the big ends and direct to the main shaft bearings appears to be by far the best, since the lubrication is not dependent on the maintenance of anything but a very low pressure, and is correspondingly more reliable. With this system, two adjuncts are indispensable for reliability, *i.e.*, an *easily detachable* gauze filter extending across the whole of the sump above the oil carried in the crank case, and an oil circulation "tell-tale" at the side of the engine within sight of the rider.

Automatic Carburettor.

For an ideal machine an automatic single lever carburettor is a necessity, with an auxiliary device and hand control fitted on the carburettor itself whereby the flow of petrol in the jet can be varied as with altitude control embodied in aero engine carburettors. This arrangement is preferable to the ordinary extra air inlet attachment which is not always a success.

In order to give ample accessibility the magneto is mounted on a platform at the rear of the crank case, and driven by a horizontal layshaft and skew gear from the cam box. It would, therefore, be an easy matter to attend to the contact breaker, since it could be arranged to face towards the right side in an open position.

Chain drive throughout is suggested for the transmission, and a three-speed gear box (sliding dog type) with a simple form of dry plate clutch is located

behind the engine. In order to give the maximum of accessibility, the engine, gear box, and clutch are mounted complete in an aluminium sub-frame, which should be arranged to slide sideways on guides from the main frame after the rear chain, controls, and silencer have been uncoupled. By this form of construction the complete outfit can be bodily lifted to a bench and overhauled at leisure. The aluminium sub-frame could also be designed to carry the lighting dynamo on brackets immediately behind the crank case in addition to the magneto, the dynamo being driven by bevel gears from the same shaft that operates the magneto. To save the complication of chain cases and to give a smooth surface for cleaning purposes, the sides of the aluminium sub-frame (which would have large detachable inspection doors) are extended sufficiently high to cover in the gear box, clutch, chain drive, crank case, and flywheel of the engine, so that the only portions visible would be the cylinders, magneto, contact breaker case, gear box, and clutch control arms, and kick-starter pedal. The final drive is on the right side of the machine, with a chain case fitted with a large cover similar to a lid on a violin case, to render it an easy matter to inspect and adjust the chain, when a sidecar is attached.

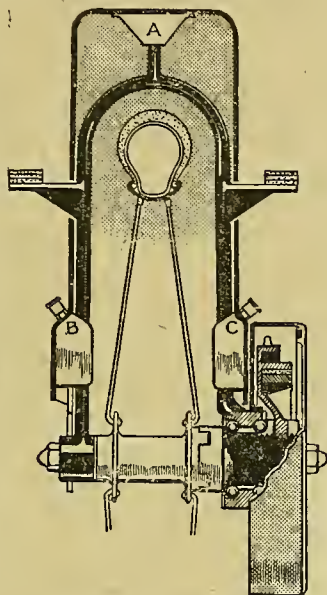


Diagram of rear spring suspension. The rear wheel moves vertically with the loop member in the slides A, B, and C attached to the frame.

General Details.

As so far very few machines have been turned out with even moderate protection from mud and wet, efficient mudguarding would be of the first importance in an ideal machine. Practically all the dirt that reaches the rider on a wet day arrives through the forward rush of the machine carrying the rider into the mud which is dripping and drifting backwards from the front mudguard and its stays. This might be eliminated by deep side valances and a wind deflector which would deflect the rush of air downwards. In both front and rear valances small doors should be fitted, in order to allow a hose to be inserted to wash and scour mud accumulated after a journey. Protection to the rider would also be given by wide footboards, attached to the main frame by short laminated springs.

On the subject of brakes, the internal expanding type for front and rear seems the best, the rear brake being fitted inside the chain case and operating on the rear chain wheel in a fully-protected position. Possibly the two brakes might be interconnected and operated from a single pedal through a compensating device.

The price of a machine as outlined would be high (unless one-type mass production was employed in its manufacture), but even so it has many advantages approaching those associated with a car, in regard to accessibility, comfort, and ease of cleaning. Many of the suggestions given may be open to criticism, but the broad outline may conceivably open up new ideas to other motor cyclists, who, like the writer, have learnt lessons derived from considerable experience on the road and in the workshop.

MILLIMETRE.

ASPECTS AND PROSPECTS.

A Rhapsody on the Pleasures
of the Motor Cycle and the
Freedom of the Roads.

THE late war has been responsible for many things, but I never thought it would have the effect of making me into a motor cyclist. The fat, unsuspecting years of slothful ease—they were really not so very slothful or easy, but it seems to be the fashion to call them so—before the war were not very good for me or for my figure, but the days since I left the army, to give my attention to work I was presumed to be more useful at, have had a good effect on the latter at any rate, and now many things—including the motor cycle—do not daunt me as they once did.

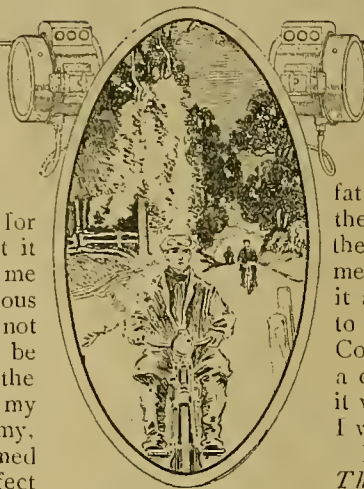
In the "Dear Dim Days."

I do not put it down entirely to this, however. Everything changes, and, undoubtedly, among other things motor cycles. When I first rode one, in the dear dead dim days before even I had a car, they were uncanny things—the direct descendants, in the opinions of many people, of high bicycles—and their riders were deemed super-athletes beyond all question when they were not looked upon as self-homicidal maniacs. Perhaps there was reason; motor cycles in those times were mere ordinary cycles with apologies for motors hung about their frames, and in the days when all automobile machines had to carry batteries and commutators and tremblers of one or other of the few sizes extant, it must be acknowledged that they could hardly be described as particularly neat and compact contrivances.

Kindred Explorers.

But we were all classed as *Yahoos* together, motorists and motor cyclists, and we had to weather the same storms. For one thing, I believe—through the mists of the past it is difficult to sort one's old memories—that we all made much the same noises; nowadays some say that an internal combustion engine makes a noise in inverse ratio to its horsepower.

One might trace in the columns of *The Autocar*—if it were worth while—my automobile education and growth, and, as my thoughts go back, I can call to mind that in their beginnings my hotel stable companions were usually motor cyclists, and that my "shop" was their "shop," and theirs was mine. We were kindred explorers and sufferers, but we had kin joys; there was never any jealousy or quarrelling between the two schools, except on the part of some very superior persons—men and women who could not think, who could not know, and who never realised that the big, swollen, ungainly, sumptuous tonneaux they leant back in had come but very few years back from the little machines they so



By OWEN JOHN
(of "The Autocar").

affected to look down upon. For the father of the car was the motor cycle, just as the motor is the absolute direct ancestor of the modern aeroplane. (The excellent gentlemen who lately, after a large luncheon, gave it as their opinion that flying owed nothing to motoring were much of the kidney of the Cockney sportsman who would not believe a certain bird could be a pheasant because it was not yet October, and I am only sorry I was not present to press the point.)

But I stray—they always let me stray in *The Autocar*, and I have got into the habit of it—I am tracing genealogies and relationships to do honour to my old love on the return of my admiration for her. The motor car owes just as much to the motor cycle as the last thing in banjos does to the earliest string instrument that ever twanged. There is more than fancy in the connection. Harken to a verse of Rudyard Kipling's "Song of the Banjo"—as inspired and wonderful a song as has ever been written, a throbbing ganglion of the nerve-ends of many lifetimes compressed into half-a-dozen little pages—and note how there is something very close between the thing he wrote about and the marvellous contraption that I am telling of.

"The grandam of my grandam was the Lyre—
(O the blue below the little fisher huts!)
That the Stealer stooping beachward filled with fire,
Till she bore my iron head and ringing guts!
By the wisdom of the centuries I speak—
To the Tune of yesternorn I set the Truth—
I, the Joy of Life unquestioned—I, the Greek—
I, the everlasting Wonder Song of Youth!"

I am not sure I have not stumbled on the right name for the motor cycle in the last line, for though my youth, as men count years, is behind me, yet I can conjure up no fairer vision of the perfection of young days than a blue spring morning, a long white road in front, a machine almost a part of oneself beneath one, and all the day one's own.

The Airman and Motor Cyclist.

Aeroplanes are not in the running. Men who fly and who know all about it tell me that all the flying man realises is himself and his engine; the land and water beneath him are but as a big map—he has nothing to do with them whatever.

But the motor cyclist—he is the lucky one. His is everything he passes and sees, the very heart of the country belongs to him. If he does not like it he can speed past, if he does he can linger, loaf, walk, or stop altogether and enjoy it. Between him and the airman there is all the difference between an embodied soul and a disembodied spirit, and, far better than his compeers at the steering wheel, he can enter into the very feel and essence of nature and the joy of life.

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Aspects and Prospects.—

That is, he *should* be able to; to some people a motor cyclist is but a goggled, belted monstrosity, possibly sucking a cigarette but most certainly looking at nothing but the dust with which he is about to bestrew the world behind him. Which is a notion I am out to disprove and contradict, and, incidentally, I hope to be able to show that the days when a motor cycle was the sole perquisite of the young are over, and that we more stolid and staid young-old ones can fit into it and get the best out of it equally well.

When I began this little essay my idea was to dwell on its undoubted utilitarian advantages, but my pen has absolutely refused to let me dwell on anything

so dull and ordinary. I can assure my readers that nothing was originally further from my thoughts than to find myself rhapsodising on its poetical side, but it seems that I have written what I have written, and that to some there may be sense and meaning in it.

I had so much else to say, too. I might have talked on its saving of petrol and on its economy in tyres. I might have compared its ease and pace with the hard work and monotony of ordinary push-cycling, but all that will do for another time, as also will my accounts and experiences of seeing England from a new aspect.

Also I shall see car motorists from another point of view, and that may charge me with material of quite a new type of sermon.

THE TANKETTE.

A Development of the Motor Scooter which will be offered to the Public in Quantities.

THE question, Why stand? will not be asked by potential purchasers of the Tankette, illustrated on this page, for, although the germ of the idea behind this little vehicle was the scooter, it is provided with a seat, and approximates to the lightweight motor cycle more than to the Auto-ped.

Weighing 135 lb., and measuring 6ft. 5in. over all, the Tankette will be marketed by Messrs. Ronald Trist and Co., Ltd., of Watford, who for many months have experimented with various forms of scooters, commencing with a small toylike machine with wheels 10in. in diameter. Just one step further, and the Tankette would be a lightweight motor cycle; hence it can be regarded more as a competitor of existing light-weights than of the scooter proper.

It is proposed to fit a 2½-3 h.p. two-stroke engine, located at the rear, and driving to a countershaft gear placed before the wheel, and hence back again to the rear hub. This makes the primary drive about 28in. and the secondary drive about 15in. between centres. The frame is constructed of flat steel strips about 1½ × ¾ in., built up so that there are six members parallel at what would be its weakest point. Both front and rear wheels are sprung on leaf springs, the centre of the pivotal rear stays being coincident with the centre of the driving sprocket.

A twin wheel is used at the rear, fitted with two 20 × 1½ in. pneumatic tyres, with a free connection from one to the other, so that on going round curves the air pressure remains constant and the two friction points where the tyres meet the ground are maintained. Both tyres can be pumped from one valve, but, if a puncture occurs, the connecting

cock may be closed and either tyre may be inflated independently. Discs, slightly dished, are used instead of spokes.

We are told that the rear wheel is instantly detachable after removing two nuts. The hub has a hollow spindle, which is used as an oil reservoir for lubricating bearings, chains, and sprockets from one filler.

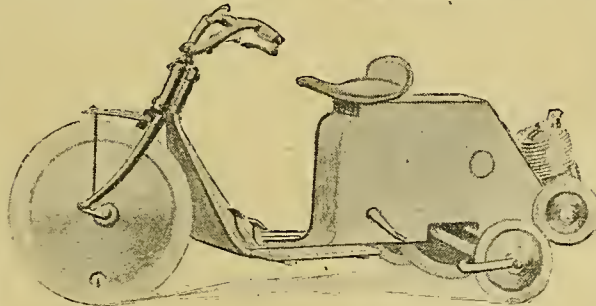
The countershaft and rear wheel transmission are completely encased, while an undershield protects other parts and the rider from mud splash.

One pedal operates the two-speed gear and free engine device, which consists of a double leather-faced clutch engaging at option either the high or low speed. The countershaft also is hollow, and contains an oil reservoir to lubricate the clutch cone, sprockets, and chain from a single filler. A shock absorber is embodied in the main sprocket on the countershaft.

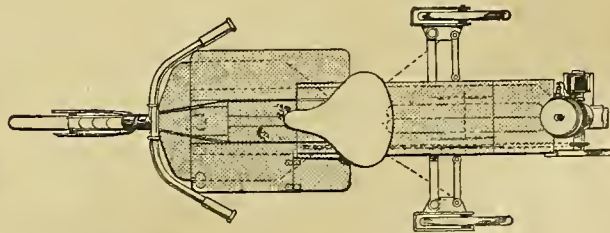
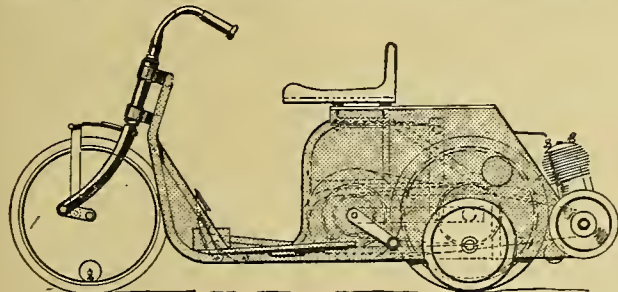
By driving air through vanes in the rear mudguarding, the back wheel is made to act as a fan.

The designers inform us that the embodiment of side wheel "runners" was decided upon after long consideration, and that they were thought necessary because the machine would be used mostly in towns and suburbs. This arrangement permits of the machine being stopped in traffic with the rider still seated and the engine running idly. A band brake on the high speed chain sprocket clutch drum on the countershaft is embodied, and a tank with a capacity for one and a third gallons of petrol is carried under the pan type seat.

The principal dimensions are as follows: Length over all, 6ft. 5in.; wheelbase, 4ft.; height to top of handle-bars, 3ft. 1in.; to seat, 26in.; platform clearance, 4in.



The Tankette—a link between the scooter and the motor cycle.



Side elevation and plan of the Tankette, shortly to be placed on the market, which will be fitted with 2½-3 h.p. engine and 20 × 1½ in. tyres.

SIMPLY A SOLO SINGLE

Arguments for the Simplest and Lightest Single-cylinder Solo Mount for the Sporting Class of Rider.

MY Army experience did it! During detention my point of view in regard to motor cycles veered round several points. Mixed up as I have been with motor cycles of all kinds, and having perforce to see them handled by riders, both male and female, of all degrees of skill, naturally I have, as a keen rider and a student of design, seen much to provide food for thought. My outstanding impression is that for solo work manufacturers are piling on too much weight. "Nothing new in that," the reader will retort, "since for years past we have had constant pleas for serviceable lightweights." But I am not thinking of weight reduction obtained by reducing the size of the engine. Often as I have watched riders operate their kick-starters, engage the low gear, and glide away on the clutch, a sense of admiration for the various progressive designers who had rendered that sort of thing possible has come over me, but, notwithstanding, I would continually reflect upon the happy and sporting days spent in 1908 to 1910, when "nippy" single-geared $3\frac{1}{2}$ h.p. solo mounts were the rule. Why, the very uncertainty of a successful climb up a single-figure gradient on that type of machine thrilled one. The personal factor in handling the machine came largely into play. As one was dependent entirely upon the tune and handling of the engine, there was a sense of satisfaction in conquering a steep hill that no climb on a variably-geared mount can convey.

Mere Soloists Neglected.

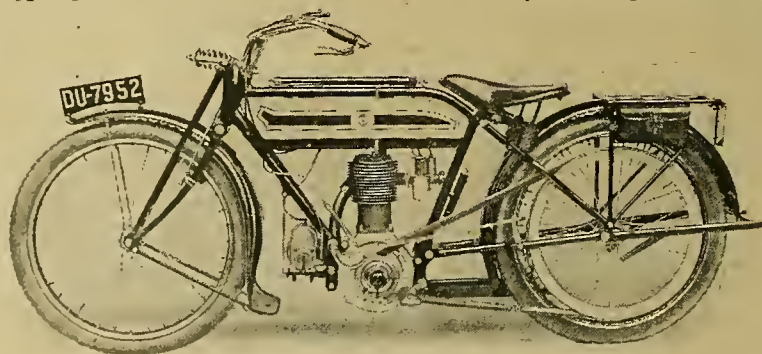
The cry for the double purpose mount for solo and sidecar work has resulted in the creation of a magnificent machine answering that requirement, but obviously a compromise cannot be ideal for one purpose or the other. Mere soloists are not being catered for as they

were years ago, passenger carrying being the vogue in these days.

Do I despise the variably-geared machine? Not a bit, even though its riders will have the laugh of me when I get stuck on a hill. Change-speeders are magnificent, as I have already said, and they are undoubtedly the machines for everyday riders, but there is a class of sporting young rider, agile and keen, who, I know, would cherish a mount on the lines of the 160 lb. $3\frac{1}{2}$ h.p. solo bicycles of ten years ago. So pleasant were my recollections of long runs, including ascents of noted hills—such as Sutton Bank—that I brooded over what a *modern* $3\frac{1}{2}$ h.p. engine should do with its ten years' advancement in design and general efficiency if fitted in a bicycle shorn of a clutch, gear box, chains and chain case, and dynamo. The removal of these items would represent possibly a 100 lb. weight reduction, a considerable relief to any engine, and render the bicycle a thoroughbred indeed. Those broken exhaust valves of olden days can now be cured by the adoption of tungsten or stainless steel, and the second bug-bear of belts pulling through at the fastener never occurs with *modern* belts.

I would risk it, I thought, and experiment, the final consideration being the saving of £25 or so in cost and a reduction in petrol consumption. So I commenced enquiries for a $3\frac{1}{2}$ h.p. T.T. mount of pre-war days, but nothing

attractive coming my way, I laid my troubles before the Triumph Co., and (joy!) my order for a simple single was accepted, the memories of the old enthusiasm for T.T. mounts years ago still being fresh in the manager's memory. I have got the machine—fitted with a 4 h.p. engine, though I would have preferred a modern $3\frac{1}{2}$ h.p. on the score of lightness—and it can be described in a twinkling.



A NEW PATTERN TRIUMPH—A SIMPLE SOLO SINGLE.

The new type 4 h.p. single-geared Triumph illustrated is fitted with a standard decompressor engine of 85 x 97 mm., 550 c.c.

Simply a Solo Single.—

It has a new rear frame, direct belt drive from an adjustable pulley—and that's all! At first I thought of a Philipson governor pulley, but have postponed that idea in the interests of weight reduction. It is merely an engine in a frame. Some will say that this is a retrograde design, but I do not think so, for engine efficiency has made marked advances, and in any case the experiment is fascinating. Those riders who dislike the snatch of a "double" drive should try a plain belt again. That is but one good point to set against the disadvantages of a gearless and clutchless machine. Starting troubles of olden days have, as I imagined, almost disappeared. Thanks to the convenient primer and the decompressor, I can walk beside my machine with the engine firing regularly, and I can turn in the space of an ordinary road without dismounting. This is with a gear of $4\frac{2}{3}$ to 1, on which ratio hills such as Edge and Tysoe are easy work, and Newnham could be ascended faster than the rider can negotiate the top corner. All these gradients are about 1 in 6. In the Lake District or Devonshire the single-gear machine would be napoo, but how many long gradients of 1 in 5 does a rider meet in a year's riding? The acceleration is remarkable. Though I have not been timed, my "walking pace" gear ratio gives me a speed approaching 53 m.p.h.—not so bad.

Engine Snatch on Greasy Surfaces.

It is only when passing over treacherous surfaces that one automatically feels for the clutch lever to cushion the drive. It is bound to be wanted—as well as a gear—many times yet, for I have not sought for freak hills; but to determine the limitations and possibilities of a modern single-cylinder for solo work was partly the object of the experiment. If readers want to know

more I shall be pleased, in the light of extended experience, to record subsequent impressions: but a word to *novices*—a single-gear machine is *not* your ideal. Only if you are experienced and take an interest in keeping your engine in the best of condition, and further if you are nimble, can the essentially sporting single-gear machine make a strong appeal to you.

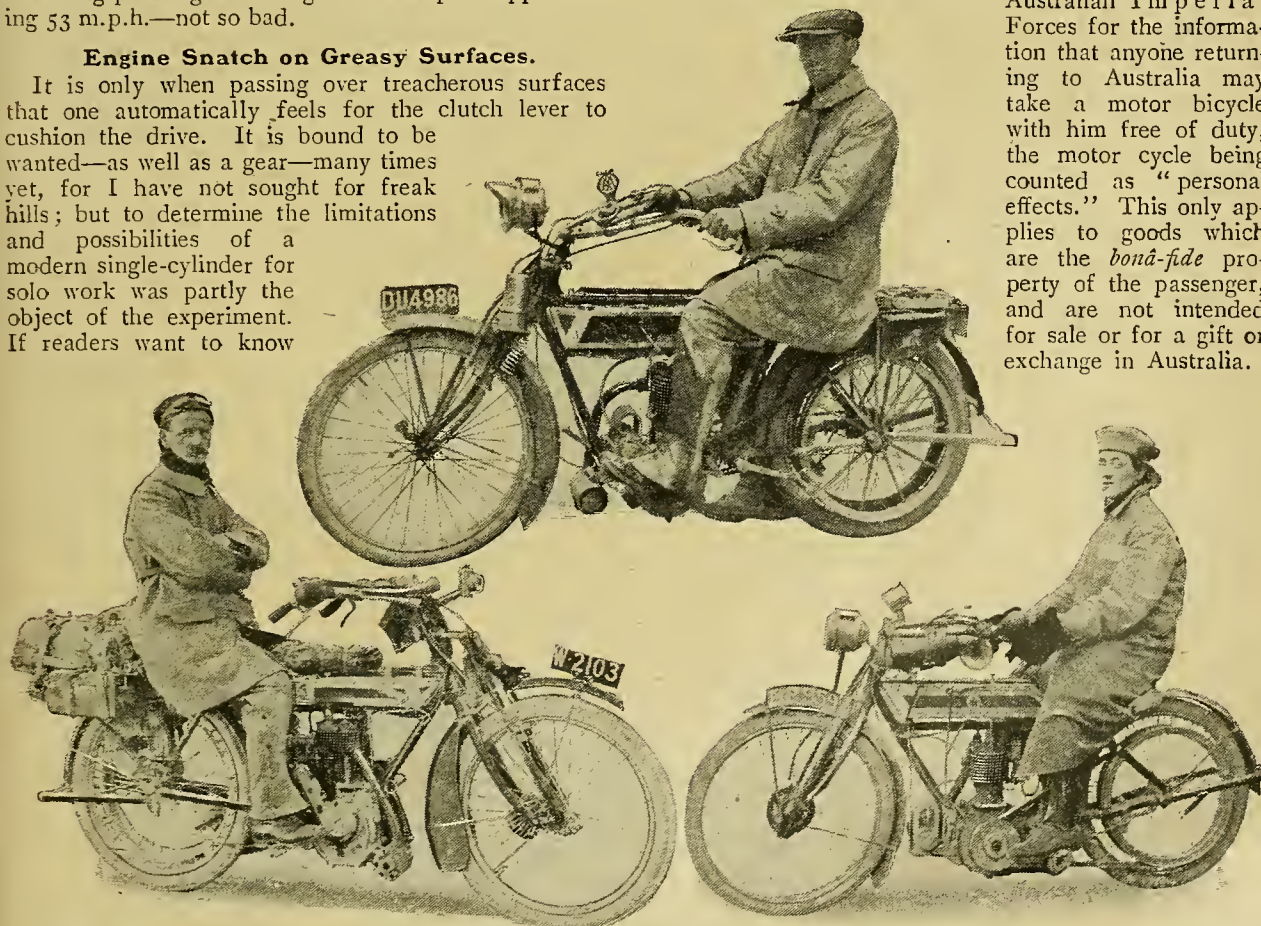
Specification of a $3\frac{1}{2}$ h.p. Solo Mount.

Had I a works at my disposal, and for the moment ignoring the cost of production, I should have drawn up a specification somewhat as follows for my most simple solo mount:

ENGINE.— 85×88 mm., medium compression, outside flywheel, cast iron liner in an aluminium shroud, as in the B.R. aero engines of Capt. W. O. Bentley's design, but extended to include the top half of the crank case. This would enable one to drop the lower half of the crank case and thus expose the big end, or even remove the connecting rod and piston complete if necessary. Detachable cylinder head, and Ricardo slipper type aluminium piston. Decompressor operated by a convenient toe and heel pedal, as on the Ariel motor bicycle. D.U.

Taking Motor Cycles into Australia.

We have to thank a reader who is a member of the Australian Imperial Forces for the information that anyone returning to Australia may take a motor bicycle with him free of duty, the motor cycle being counted as "personal effects." This only applies to goods which are the *bona-fide* property of the passenger, and are not intended for sale or for a gift or exchange in Australia.



THE SIMPLE SOLO SINGLE IN 1911. (Left) Fred Dover on his $3\frac{1}{2}$ h.p. single-gear Premier, upon which he rode round the coast of Great Britain. (Top) O'Donovan ($3\frac{1}{2}$ h.p. single-gear Singer), who completed 3,000 miles without opening his tool-bag. (Right) W. J. Clarke, ($3\frac{1}{2}$ h.p. Rex), who covered 2,700 miles in six days, June 6th to 11th, 1911.

THE QUESTION OF ACCOMMODATION.



The Third Passenger—
Juvenile and Adult—
on Pillion and in Sidecar.

THE sidecar is frequently referred to as the most economical form of motoring for two. It is also the cheapest means of transport for three persons. This is at least one point where the sidecar scores over the three-wheel runabout for, while it is almost impossible to find room for a third passenger on a cycle car having three wheels, it is comparatively easy to accommodate three adults on a sidecar outfit, and this in a manner much more comfortable for the third passenger than on the average light car fitted with a dickey seat.

On a sidecar outfit it is a simple matter to fix a sprung seat on the carrier for an adult, and many a motor cyclist has travelled thousands of miles with his wife in the sidecar and "grown-up" daughter on the pillion, and, provided due attention is paid to the method of fixing and supporting the seat, there is nothing to be said against the practice. Even the $3\frac{1}{2}$ h.p. outfit is used quite extensively in this manner, though at first sight it appears a somewhat heavy load for a 500 c.c. engine. While three adults on such a machine are not to be recommended, one cannot ignore the argument brought forward by those who find that the popular single $3\frac{1}{2}$ h.p. will do the work. Briefly, the argument is this: a $3\frac{1}{2}$ h.p. outfit weighs approximately 350 lb., three adults approximately 450 lb. more, making a total of 800 lb.

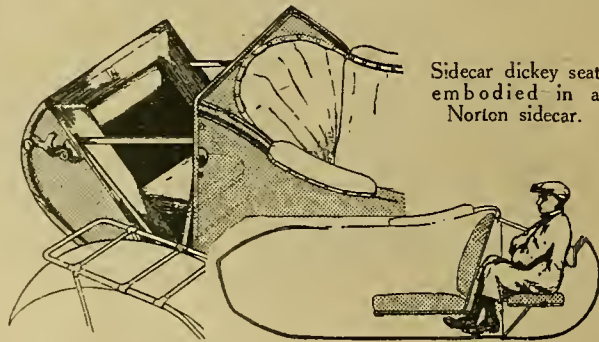
Engines of twice the size frequently are used in cycle cars weighing 900 lb. unladen, and successfully carry three adults who bring the total weight up to 1,350 lb. In addition, the vehicle has four wheels against the sidecar's three, and the effort required to overcome the extra friction of the car type transmission and the extra wind resistance brings up the total load on the engine to quite twice that of a $3\frac{1}{2}$ h.p. carrying three persons. Whether this is a reasonable view to take is an open question. We know that a $3\frac{1}{2}$ h.p. will take three persons, but it means hard work for the engine, which must be detrimental if the outfit be used a great deal in this manner. A 5-6 h.p. twin is the smallest engine which can be expected to give satisfaction if three adults are to be carried.

Inside or Outside the Sidecar?

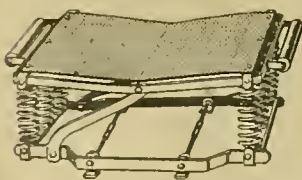
The majority of owners will prefer to carry the third passenger on a pillion seat, but the alternative method of having a double-seated sidecar is well worth considering. True, the average tandem sidecar is not so pleasing in appearance as the single-seater, but there are good-looking tandems which, attached to a big twin machine, do not look unduly large. There is another two-seated sidecar which has not been seen in this country in any great numbers. This is the sociable sidecar with side-by-side seats. Probably this type is only suitable for the most powerful machines owing to the extra windage of the wider body, but except for this the sociable sidecar has much to commend it.

It is in accommodating the juvenile passenger that the greatest difficulties arise. It is a problem which may be solved for one year and have to be tackled again the next.

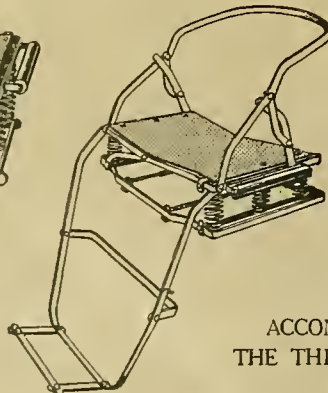
That a baby can be carried in the arms of its mother is true, but even a young baby can rob side-carring of most of its pleasures if the sidecar is not roomy. Especially is this so if the mother is not strong, when the strain



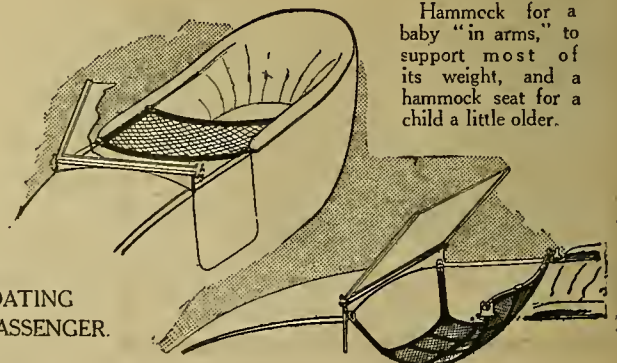
Sidecar dickey seat embodied in a Norton sidecar.



The Tan Sad seat for tandem or pillion rider.

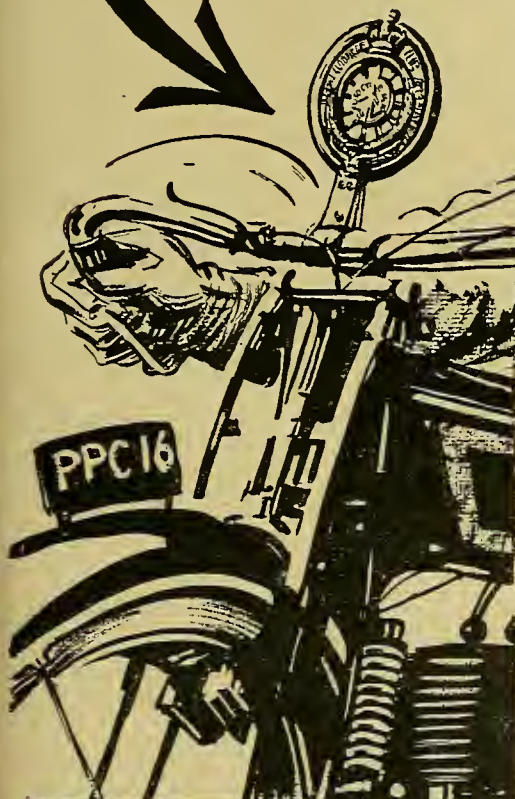


ACCOMMODATING THE THIRD PASSENGER.



Hammock for a baby "in arms," to support most of its weight, and a hammock seat for a child a little older.

*Fit THIS Badge
to YOUR machine*



EVERY Motor Cyclist should
Join the A.C.U. without delay.

The A.C.U. gives its members the fullest value for their subscriptions, and places an organisation at their disposal which is unapproached by any other association

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FREE "GET-YOU-HOME" SCHEME, whereby in case of accident or breakdown on the road your machine is taken to the nearest garage and a car is placed at your disposal to drive you and your passenger home or to the nearest Railway Station, FREE Legal Advice and Defence on all matters motor cycling, FREE Assistance of the R.A.C. Road Guides, FREE Use of a Reading Room at the R.A.C., FREE Assistance in Touring and Foreign Travel, SPECIAL INSURANCE FACILITIES, etc., etc

**Fill in and Post the Information
Coupon for full details NOW!**

Information Coupon

The Secretary,
AUTO-CYCLE UNION,
PALL MALL, LONDON,
S.W.1.

Please send me further particulars regarding the advantages of becoming a member of the A.C.U., together with Application Form for membership.

Name

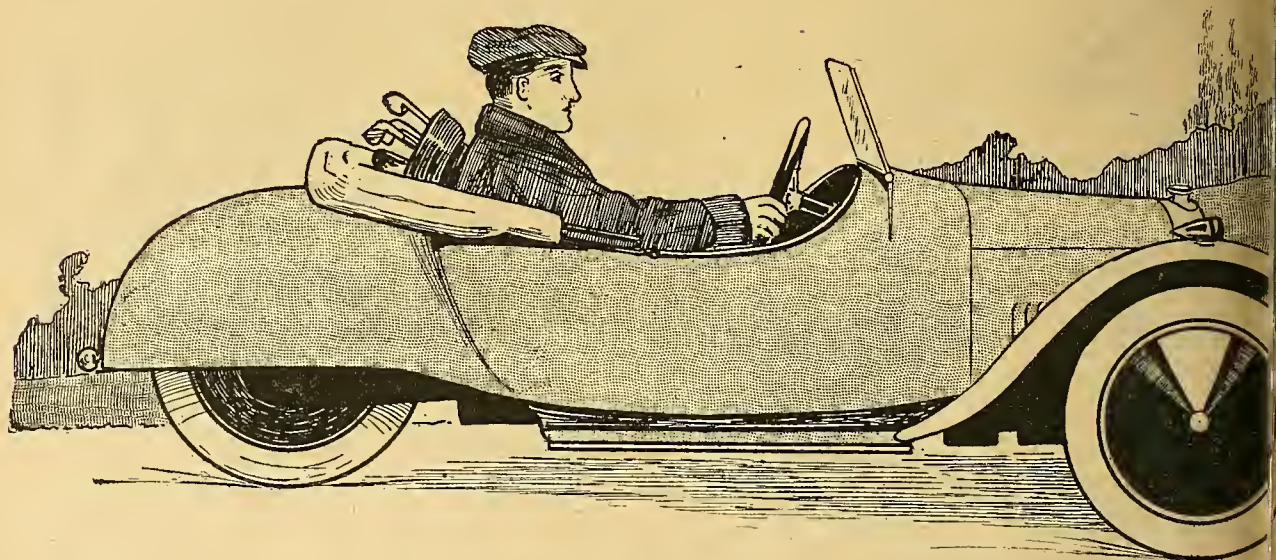
Address

"The Motor Cycle," 314 1/2.

In answering this advertisement it is desirable to mention "The Motor Cycle."

PREMIER

SUPER RUNABOUT



GOOD APPEARANCE IS ANOTHER STRONG POINT OF THE SUPER RUNABOUT

It appeals to men and women who want a car and do not feel justified in paying the car price. Here, they think, as they turn to watch it speed by, is a vehicle embodying most of the advantages of both sidecar and car — a real stepping stone between the two — clean, cosy, and compact.

If they obtain a catalogue they learn that it is fitted with a water-cooled 8-10 h.p. twin engine, three speeds and reverse shaft and enclosed chain transmission, and 700×80 tyres. Such particulars may convey little to them, but on enquiry their more mechanical friends tell them that it is a sound engineering job, and one they can recommend. Then another couple joins the ranks of motorists to experience the joys of the open road.

Write to-day for advance list.

COVENTRY PREMIER LIMITED,
COVENTRY.

and Bristol House, 19-20, Holborn Viaduct, London, E.C.1.



In answering this advertisement it is desirable to mention "The Motor Cycle."



KEMPSHALL'S

have been on
WAR SERVICE

for more than four years.

PRIOR TO THE WAR Kempshalls
held the World's Record both for
SPEED & RELIABILITY

DURING THE WAR we have added
still further to our reputation as
the finest Motor Cycle Tyre on the
market. Although many thou-
sands of tyres have been supplied
to the British, American, and
Allied Governments, we have not
received one single complaint.

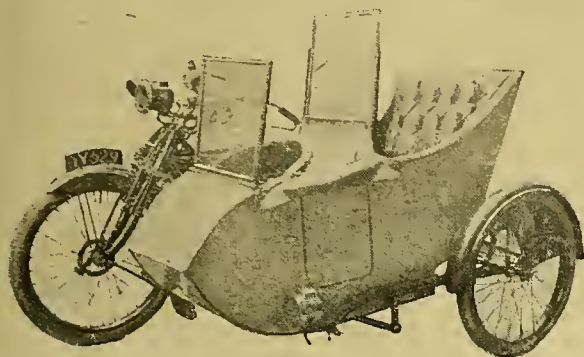
Write for copy of new List with prices
and illustrations of our new models.

THE KEMPSHALL TYRE CO. (of Europe), LTD.
97-98, LONG ACRE, LONDON, W.C.
Telephone—244, Gerrard (2 lines). Telegrams—"Studless, London."
Cambridge Street Rubber Works, Manchester.

C.D.C.

The Question of Accommodation.—

of sitting in a cramped position makes a moderately long journey most fatiguing. Therefore, the motor cyclist who contemplates taking his wife and baby with him on his jaunts this year should devise some



Tandem sidecar for adult and child.

means to relieve his wife of the baby's weight. It should be quite an easy matter to make a portable hammock to be slung on the sides of the sidecar.

It is the slightly older child who is so difficult to accommodate; too young to sit on a stool at its mother's knee, and too heavy to be "nursed" for long journeys, probably a hammock seat to take the weight from the mother's lap is the only solution to the problem. When it is a little older a stool before the seat will meet the case, but when the child reaches the age of four the problem has to be tackled more seriously, and probably a larger sidecar will be necessary. The stool is inadequate again; in fact the hammock seat will be found useful in carrying a juvenile inside the sidecar body from all ages until he or she becomes too big for the space available.

At eight—and until the child is a child no longer—proper accommodation has to be provided. If this is to be in the sidecar, then the tandem type must come into use, but there is no reason why the sociable idea should not be considered. Without going to the width of the side-by-side seater for two adults, it should be possible to have on a chassis of conventional type a body of sufficient width to accommodate one adult and a juvenile. A few inches could be spared between sidecar and driver, and on the majority of sidecars there is quite a wide gap between sidecar and wheel which could be utilised to advantage.

If a sociable sidecar on these lines were made it might be found convenient to stagger the seating slightly. Such accommodation would be quite suitable for a boy or girl from eight to twelve years of age, after which the juvenile becomes an adult so far as seating is concerned, and the only means of accommodating her (or him) is on a full-size two-seated sidecar or on a pillion seat.

Sidecars have been produced which have a dickey seat for a child, but it cannot be claimed that they are an unqualified success, for while the baby may be content to go off into the land of dreams—and it almost invariably does when sidecarring—the child old enough to occupy a dickey seat usually desires to see more than the back panel of the sidecar body and the bottoms of hedgerows streaking past in a blur.

To summarise, it should not be a very difficult matter to accommodate the third passenger—juvenile or adult, but certain it is in the former case a large number of motor cyclists do not take the trouble. Let them do this and so make sidecarring a greater pleasure to their passengers, and then there will be fewer



A sociable-seated sidecar fitted to a Harley-Davidson motor cycle.

complaints of cramped quarters. In conclusion, it should be remembered by those who do not occupy the sidecar seat that the larger the sidecar the more comfortable it is, and that it should have a screen to keep off the pressure of the wind, which is not noticed by the man on the saddle.

THE VICTORY CUP TRIAL.

THE first post-war open reliability trial to be held in Great Britain is bound to attract a great deal of interest, therefore the Victory Cup Trial, organised by the Birmingham M.C.C. for Easter Monday, will probably be well supported by Midland competition riders. In addition to medals, the awards will include three cups, *i.e.*, the Victory Cup, presented by Lord Calthorpe for the best performance on any machine; the Duke Cup, presented by R. W. Duke, Esq., for the next best performance; and the Evans Service Cup, presented by P. J. Evans, Esq., for the best performance by a member or ex-member (either sex) of His Majesty's Forces.

The start will be at 9 a.m. from the top of Griffin's Hill, Selly Oak, Birmingham, and the course will be approximately 120 miles, taking in many of the well-known hills in the Malvern and Cotswold districts, and probably including the Old Wyche, Portway, Birdlip, Gamble's Lane (Rising Sun), and Sudeley. The lunch stop will be at Cheltenham.

The schedule has been worked out at 20 m.p.h., and awards will be made on marks. The entries close on Saturday, April 12th, the entry fees being £1 rs. for non-members of B.M.C.C. and 10s. 6d. for members.

The hon. trials secretary is Mr. S. K. Jones, 93, John Bright Street, Birmingham.

A SPRING RUN INTO KENT AND SUSSEX.

Legend and Folklore of Old-world Villages.

By CHARLES G. HARPER.

THERE will be more enjoyment in the opening spring runs of 1919 than many a year has known; and Easter fortunately comes late this year, so that the trees will not be altogether bare, the days will be longer, and—if the spring itself be not unkind—the weather warmer than that of most Easters.

Where, then, shall we go? There is an actual embarrassment of choice, for one can go so far nowadays, and some folk are ambitious. This is not an ambitious tour. It is, indeed, quite a little one, but I think it will be found of interest. We will start from Hyde Park Corner, and, coming out of London by New-Cross, Lee, and Eltham, make, by way of Sidcup and Farningham, for Maidstone. It is an excellent main road, and not likely to be lonely, to say the least of it. The holiday-maker, come back anew to the road after the winter, will probably not want to stop anywhere short of Maidstone, and the broad highway leads him on. Beyond that capital of Kent it is another matter. Maidstone at holiday times does not attract me; nor, indeed, does any considerable town at such seasons. Otherwise I would invite you to inspect the upper floor of the curious old red-brick Town Hall in the High Street, which was once used as a lock-up. On its beams the prisoners have left some quaint records; among them one Davis: "Davis. 3 times here to please his wife." And Davis yet again: "Job wept at Misfortune. Davis smiles. Davis. 1799. 3 months."



A Biddenden cake.

I confess I should like to know something more of Davis: but it may not be!

So we proceed on our way, making for Sutton Valence and Headcorn; now fairly in the midst of Kentish ruralness. At thirteen miles from Maidstone stands Biddenden, whose Easter Monday custom is one of the objects of this little tour. It is one of the several villages known locally and collectively as "the dens," of which Smarden, Bethersden, and Rolvenden are examples. Biddenden, once one of the Kentish cloth-weaving villages, still has some of the old cloth-weavers' cottages to show, and it is in addition a most picturesque and old-world place; almost unique in keeping to this day the original old rough flagstones, quarried locally, which for centuries have paved the footpaths of the village street. Exactly what Biddenden is the accompanying illustration serves to show: an unspoiled community of the Kentish weald. There are the old red-roofed cottages, with two or three inns, and the grey church tower at the further end. Few tourists know Biddenden, but it is locally famous for the "Biddenden Maids," sisters who are reputed to

have lived in the twelfth century, and to have founded the charity which is still oddly celebrated every Easter Monday. Some antiquaries insist that the famous "Maids"

never existed, but that view is not popular in Biddenden itself; and the antiquaries, while (as we think) unreasonably sceptical, do not explain how, if they never had any existence, the charity came into being. The accepted legend tells how Eliza and Mary Chulchurst were twins, born in Siamese twin fashion, joined together at hips and shoulders. Thus they are supposed to have lived thirty-four years; and, when one sister died, the other survived her by only six hours. They died, according to the story, in 1100, and bequeathed "twenty acres, more or less," for the purpose of providing an income by which annually, on Easter Day, the poor of Biddenden were to receive each a loaf and a piece of cheese; and in addition all strangers passing through the village were to have a cake stamped with the effigies of the sisters. No trace of this will has ever been found, nor can the date of the first celebration be traced. In fact, the antiquaries aforesaid consider that the date stamped on the cakes should be "1500," not "1100." The charity has been at least once in danger, notably in 1656, when the then rector of Biddenden, one William Horner, laid claim to the "Bread and Cheese Land," but happily failed. This land now produces some £40 annually. Until 1906 the distribution of bread and cheese took place at the church door after morning service on Easter Sunday, the cakes being handed to all and sundry at the same time. Crowds came with the object of receiving one



The old church, Rye.



Biddenden, an old Kentish cloth weaving village.

A Spring Run into Kent and Sussex.—

of those singular cakes; and the day was changed to Monday, in the hope that not so many people would be able to put in an appearance.



The picturesque ruins of Ore old church.

The bread and cheese distribution is now made at a cottage which was once the old workhouse, half a mile from the village, at ten o'clock in the morning. There are about one hundred recipients of this dole.

The so-called "cakes," of which any stranger may obtain one or two, are desirable rather as curiosities than as edibles. They are made of plain flour and water, and are, in fact, a kind of biscuit, impressed by a wooden stamp with two curious (and ferociously hideous) figures of the legendary sisters.

Old-world Places.

Tenterden, in a further four and a half miles, is one of those old remote and unchanged towns, which look much alike, holidays or no holidays. It is a stately and a likeable place. The most interesting way from it to Rye is by Smallhythe, a tiny hamlet with very picturesque half-timbered houses and the most remarkable toll-gate in England. The gate admits to a privately-owned road, and the tolls are eccentric. Pedestrians pay one farthing, a motor bicycle three-pence.

Rye looms ahead, prominent on its hilltop across the marshes: an old, old town, beloved of artists. There are the old quays, the Ypres Tower, the Mermaid Inn, the cobblestone streets, to tell of what an old seaport was like centuries ago. Rye is quiet, but Winchelsea is dead and buried as a seaport. Once ships came to the haven under the hill, but the sea is now two miles distant, and sheep graze where vessels once rode at anchor.

Eleven miles of a swooping undulating road bring one to Hastings, which the spring tourist, now on the road for the first time after the winter, may like to visit for the invigorating sea air. To me the most interesting part of Hastings is the Old Town, where some quaint streets survive. There, too, is St. Clement's Church, with the old cannon-ball in the upper part of the tower, shot into it by the French or the Dutch at some date unknown. Down on the beach, in the fishermen's quarter, the odd "tackle boxes," where the fisherfolk store their nets and other gear, form a curious survival.

The Return.

We have now come some seventy-three miles. There are two London roads out of Hastings: the new, through Silverhill and Bohemia, and the old, through the Old Town and Ore. Both meet at Baldslow, and both are horribly infested by tramlines. But the old road for preference. Rarely noticed at Ore, away to the left, is Ore old church, roofless and fast going to complete ruin. The sole reason for neglecting it was that the people of Ore new village lusted for a brand new building beside the road.

At Baldslow we leave the tramlines behind, and come up along the main road to London through Battle, too well known to be mentioned in detail. Thence by Robertsbridge and up Silver Hill to Hurst Green and a junction of roads at the approach to Lamberhurst. Instead of proceeding into the village, we turn here to the left, leaving the main road through Tonbridge to London, and make for Tunbridge Wells by Frant, a very good and fast road indeed. The only things to interest the pilgrim in search of the picturesque in Tunbridge Wells are the unique old promenade called "The Pantiles" and the red brick church hard by dedicated to "King Charles the Martyr"—one of the five churches in this country thus honouring the memory of Charles the First. I should like to add that no man knoweth why "Tonbridge" should be spelled with an "o" and "Tunbridge Wells" with a "u."

An interesting way back to London is by Langton Green. Passing the church and then turning right, one comes in two miles to the quiet spot called "Pound's Bridge," with the inn of that name as its chief feature. It bears the date "1593," and was built by one William Darkenall, rector of Penshurst, as a residence. Strange fortune made an inn of it



Tackle boxes at the fishermen's quarters, Hastings

many years ago. Penshurst itself, one of the prettiest villages in Kent, lies ahead; famous for Penshurst Place, the baronial home of the Sidneys. Straight on, to Penshurst railway station and then turning left, a good six miles run follows to Crockenhill, in the midst of the Kentish fruit farming district. Then come Limpsfield and Oxted, followed by Tyler's Green, hard by Godstone. Turning here to the right, and climbing up to Caterham, the way grows suburban to Purley and Croydon. The whole trip comes to 140 miles.



How the Blue Riband of the Motor Cycle World originated, and its Progress up to the Present Time.

THE memory of the public is proverbially short, and perhaps it is not generally known how closely *The Motor Cycle* is connected with the origin of the Tourist Trophy Race. Nor is it fully appreciated how the race has grown from an after-dinner suggestion to the Blue Riband of the whole motor cycle world. To review the famous race is the object of this article, and no doubt it will serve to refresh the memory of our older readers, in addition to placing before new-comers to the sport and pastime a comprehensive history of the classic event.

The first suggestion that such a race as the T.T. would be keenly followed by motor cyclists and benefit the movement was made by the late Mr. H. W. Staner, editor of *The Autocar* and at that time managing editor of *The Motor Cycle*. This was at the A.C.U. dinner in January, 1906, and the very uncertain position of the motor cycle movement at that time (due to daily press attacks) is revealed in the following extracts from Mr. Staner's speech.

A Perpetual Challenge Trophy.

Was he, he asked, at a funeral banquet? It might be so. Motor cycling was dead—at least so said its enemies. . . . Motor cycling was the finest amusement in the world. . . . He hoped that some competition could be arranged for motor cycles on the lines of the car Tourist Trophy. He suggested that the engine dimensions and weight should be limited and that the machine should be fitted with mudguards, brakes, etc., and should be fit to ride as a touring machine.

That a Tourist Trophy race would be held during the next year was announced in *The Motor Cycle* for December 12th, 1906, and in the following issue particulars were given of the trophy, which, it was announced, would be presented by the Marquis de Mouzilly St. Mars—a gentleman who had done an enormous amount of work towards the furtherance of the motor cycle sport and industry. It was presented as a perpetual challenge trophy and the race was to be an international one.

Classifying the Competitors.

The main object of holding the competition was to show that British motor cycles could beat their foreign competitors.

Although the first race was not a consumption trial, each machine was allowed only a certain amount of fuel. There were two classes—singles and twins—and the allowance of petrol for the former was on a basis of 90 m.p.g. and that for the twins 75 m.p.g. Each rider was given an extra pint for leakage and wastage. The course was from St. John's to Ballacraigne, via Creg Willey's Hill to Kirk Michael, and back to the starting point by way of Peel—a distance of 15½ miles, which was covered ten times.

In 1908 the petrol allowance was reduced to a gallon for a hundred miles for the singles and a gallon for eighty miles for the twins. This year no machines were allowed to be fitted with pedals.

In 1907 and 1908 the single and multi-cylindere machines were raced separately, but in subsequent races there was one class only—single and multi-

The Story of the T.T.—

cylindere machines competing against each other, although not exactly on equal terms, the singles being handicapped until 1912, when the capacity limit of 500 c.c. applied to all types of engine.

In 1909 the fuel allowance was abandoned and a cylinder capacity limit imposed, the singles being limited to 500 c.c. and the multi-cylinders to 750 c.c.

In 1910 the single-cylinder capacity limit remained the same, but that of the multi-cylinders was reduced to 670 c.c., while in 1911 the capacity of the multi-cylinder machines was further reduced to 585 c.c.

From the schedule on page 351 it will be seen that in 1907 and 1908 the singles of 431 and 454 c.c. were considerably faster than the twins of 662 and 745 c.c. capacity. That great improvement was deemed to have been made in the latter type is revealed by the reduction of the twin c.c. limit to 670 c.c. in 1910 and 585 c.c. in 1911. The A.C.U. evidently underestimated the advance in twin design, and by the time it realised this and raced all types on equal terms the Scott two-stroke twin had come forward as a speed machine.

1911 saw the first of the Junior races with singles limited to 300 c.c. and twins to 340 c.c., but in 1912 the limit was made 350 c.c. for all types.

In 1911, also, the course was changed from one 155 miles in length to 262½ miles for the Senior and 225 miles for the Junior race. This was the car trophy course, known as the four-inch course, on account of the fact that the engines of the cars using it were limited to a 4in. bore.

Single v. Twin.

In the six Senior races in which singles raced against twins (1909-1914 inclusive), the single-cylinder scored in the last event only, *i.e.*, the Rudge in 1914. In three of these races the twins were given the advantage of increased cubical capacity. Of the three remaining races, in which the two types raced on equal terms as regards cylinder capacity, the Scott two-stroke won twice (1912 and 1913)—hence the net result of the six races was as follows:

585, 670, and 750 c.c. twins *versus* 500 c.c. singles; the two-cylinder won three times. 500 c.c. twins *versus* 500 c.c. singles; two-cylinder two-stroke won twice, one-cylinder four-stroke won once.

Thus it will be seen that a four-stroke twin (V or flat) has not yet succeeded in beating a single of the same capacity.

Highest Average Speeds.

The highest average speed in the Senior T.T. was that of Mr. C. R. Collier (5 h.p. Matchless), the winner in 1910, when the old course was covered at an average speed of 50.6 m.p.h.

In the Junior T.T. the machines have raced on equal terms, excepting in the first of the races in 1911, when the twins were given the advantage of an extra 40 c.c. capacity. The net results give three wins to V twins and one to a single (A.J.S., 1914).

Mr. Eric Williams (A.J.S.), the winner of the last Junior T.T., made the fastest time of the series, Mr. C. Williams (A.J.S.), second in the 1914 race, making second fastest time of the series, the average speeds being 45.6 and 44.7 m.p.h. respectively.

In the earlier races the places were about equally divided between the Triumph and Matchless machines, but after the Indian secured first, second, and third places in 1911, this rivalry became submerged in the brilliant successes of others.

The results given below show that throughout the history of the T.T. race six makes only figured in the first, second, and third positions. This is excluding the multi-cylinder classes of 1907 and 1908.

1907 ... 1.	Matchless.	2.	Triumph.	3.	Triumph.
1908 ... 1.	Triumph.	2.	Matchless.	3.	Triumph.
1909 ... 1.	Matchless.	2.	Indian.	3.	Triumph.
1910 ... 1.	Matchless.	2.	Matchless.	3.	Triumph.
1911 ... 1.	Indian.	2.	Indian.	3.	Indian.
1912 ... 1.	Scott.	2.	Triumph.	3.	Matchless.
1913 ... 1.	Scott.	2.	Rudge.	3.	Indian.
1914 ... 1.	Rudge.	2.	{Sunbeam. Indian.}	3.	Matchless.

Senior T.T. Leaders.

If we count the twin-cylinder classes of 1907 and 1908 and make a total of ten races, it will be seen that it was possible for thirty different makes to figure as first, second, or third in the Senior results. Instead of thirty (or rather thirty-one, because in one race two machines tied for second place), twelve only can be mentioned, and seven of these are only mentioned once. These twelve makes secure the following places:

	First.	Second.	Third.	Total.
Bat	1	—	—	1
Dot	1	—	—	1
F.N.	—	—	1	1
Indian	1	3	2	6
Matchless	3	2	2	7
Norton	1	—	—	1
Rex	—	—	1	1
Rudge	1	1	—	2
Scott	2	—	—	2
Sunbeam	—	1	—	1
Triumph	1	2	4	7
Vindec	—	1	—	1
				31

Junior T.T. Leaders.

Treating the Junior T.T. in a similar manner, we arrive at the following results:

	First.	Second.	Third.	Total.
Douglas (2-cyl.)	1	2	—	3
Forward (2-cyl.)	—	—	2	2
Humber (2-cyl.)	1	—	—	1
Matchless (1-cyl.)	—	1	—	1
N.U.T.-J.A.P. (2-cyl.) ..	1	—	—	1
Ivy-Precision (1-cyl.) ..	—	—	1	1
A.J.S. (1-cyl.)	1	1	—	2
Enfield	—	—	1	1
				12

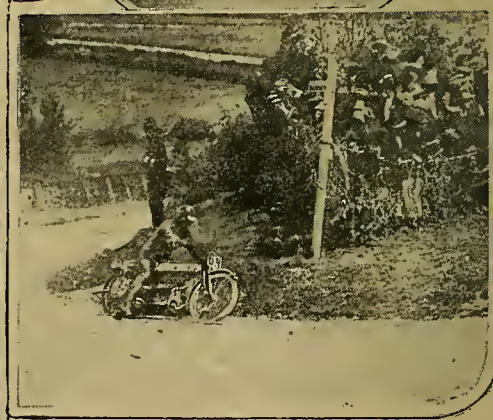
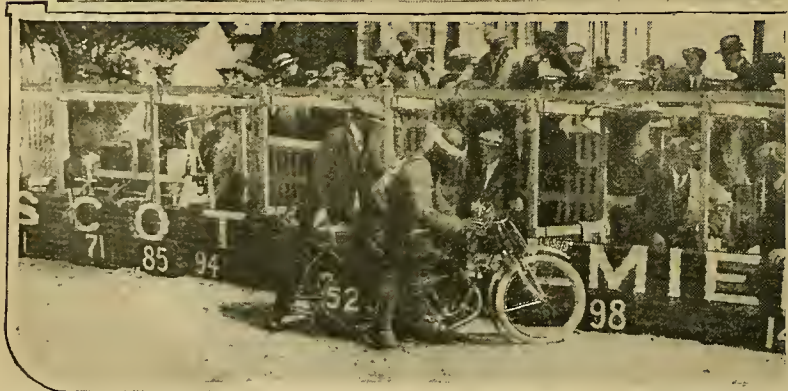
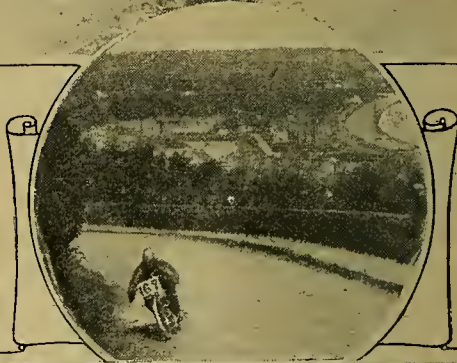
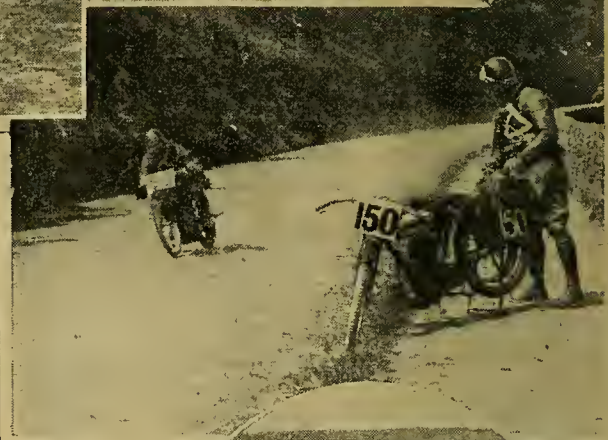
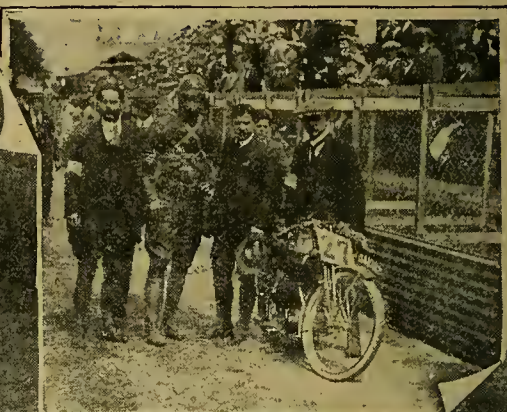
Thus in four races eight makes secure a place out of a possible twelve, which is a more equal distribution of honours than in the Senior T.T.

The Next T.T.

The next T.T. race is likely to surpass all others on the point of interest. For one reason, there will have been a gap of five years, and most engine designers have learned more during that time than any similar period before. In all probability we shall see a very keen contest between five different types of engine, *i.e.*, the four-stroke singles, V twins and flat twins, and two-stroke singles and twins, and while present-day tendencies appear to indicate that the high-revving flat twin will be prime favourite, it would not surprise us if the single-cylinder type gave the motor cycling world a surprise. The single four-stroke still holds all the 500 c.c. records, and the makers of this type of engine still retain their faith in it, even as a record breaker.

The Blue Riband of Road Events.

SCENES AT THE T.I. RACES, ISLE OF MAN



THE TOURIST TROPHY RACES,

1907-1914.

Classification of Entrants. First Three in each Race, and the Machines they rode.

Date.	Conditions.	No. of Entrants.			Rider and Machine.	Particulars of Engine.				Time.	Average Speed, m.p.h.
		Singles.	Multi-cyl.	Total.		No. of Cyl.	Bore. mm.	Stroke. mm.	Capacity. c.c.		
1907	Two classes. Singles and multi-cylinders. Fuel limits of one gal. per 90 miles for singles; 1 gal. for 75 miles for multis.	17	8	25	Singles.					h. m. s.	
					C. R. Collier, 3½ h.p. Matchless.	1	85	76	431	4 8 8½	38.5
					J. Marshall, 3½ h.p. Triumph.	1	82	86	454	4 19 47½	36.5
					F. Hulbert, 3½ h.p. Triumph.	1	82	86	454	4 27 49½	35.5
					Twins.						
					H. R. Fowler, 5 h.p. Norton.	2	75	75	662	4 21 52½	36.2
					W. H. Wells, 5 h.p. Vindec.	2	75	75	662	4 53 44½	32.3
1908	Two classes. Singles and multi-cylinders. Fuel limits, 1 gal. for 100 miles for singles; 1 gal. for 80 miles multis.	15	22	37	W. Heaton, 5 h.p. Rex.	2	77	80	745	5 11 3½	30.5
					Singles.						
					J. Marshall, 3½ h.p. Triumph.	1	84	86	476	3 54 50	40½
					C. R. Collier, 3½ h.p. Matchless.	1	85	76	431	3 57 0	40
					Sir R. K. Arbuthnot, 3½ h.p. Tri'ph.	1	84	86	476	4 7 57	38½
					Multis.						
					H. Reed, 5 h.p. Dot.	2	75	75	662	4 5 58	38½
1909	Fuel limits abandoned. 1 class only. Capacity limits: singles 500 c.c. multis 750 c.c.	31	28	59	W. H. Bashall, 6-7 h.p. Bat.	2	76	95	431	4 8 15	38
					R. O. Clark, 5 h.p. F.N.	4	50	57	494	4 11 2	37½
					(1) H. A. Collier, 5 h.p. Matchless.	2	85	65	738	3 13 37½	49.04
					(2) C. Lee Evans, 5 h.p. Indian.	2	71.5	89	714	3 17 35½	48
1910	1 class only. Capacity limits: singles 500 c.c. multis 670 c.c.	43	40	83	(3) W. F. Newsome, 3½ h.p. Tri'ph.	1	85	88	499	3 31 10	44.92
					(1) C. R. Collier, 5 h.p. Matchless.	2	85.5	58	666	3 7 24	50.62
					(2) H. A. Collier, 5 h.p. Matchless.	2	85.5	58	666	3 12 45	49.22
					(3) W. Creyton, 3½ h.p. Triumph.	1	85	88	499	3 17 58	47.92
1911	Capacity limits: Singles, 500 c.c. Multis, 585 c.c.	43	24	67	(1) O. C. Godfrey, 3½ h.p. Indian.	2	70	76	584	3 56 10	47½
					(2) C. B. Franklin, 3½ h.p. Indian.	2	70	76	584	3 59 52	47
					(3) A. J. Moorhouse, 3½ h.p. Indian.	2	70	76	584	4 5 34	46
					(1) F. A. Applebee, 3½ h.p. Scott.	2	69.8	63.5	486	3 51 3	48.69
1912	Capacity limit: 500 c.c. in all types.	27	22	49	(2) J. R. Haswell, 3½ h.p. Triumph.	1	85	88	499	3 57 57	47.28
					(3) H. A. Collier, Matchless.	2	70	64.5	496	4 1 56	46.50
					(1) H. O. Wood, 3½ h.p. Scott.	2	69.8	63.5	486	5 26 18	48.28
1913	Capacity limit: 500 c.c. for all types.	78	25	103	(2) A. R. Abbott, 3½ h.p. Rudge.	1	85	88	499	5 26 23	48.27
					(3) A. H. Alexander, 3½ h.p. Indian	2	70	64.5	496	5 30 11	47.67
					(1) C. G. Pullin, 3½ h.p. Rudge.	1	85	88	499	4 32 48	49.49
1914	Capacity limit: 500 c.c. for all types.	49	53	102	(2) H. R. Davies, 3½ h.p. Sunbeam.	1	85	88	499	4 39 12	48.39
					(3) O. C. Godfrey, 3½ h.p. Indian.	2	69.8	65	498	4 39 23	48.36
					(4) H. V. Colver, 3½ h.p. Matchless.	2	70	64.5	496		

JUNIOR T.T. RACE FOR LIGHTWEIGHTS.

1911	Capacity limit: Singles, 300 c.c. Twins, 340 c.c.	21	16	37	(1) P. J. Evans, 2½ h.p. Humber.	2	60	60	340	3 37 7	41½
					(2) H. A. Collier, 2 h.p. Matchless.	1	76	65.5	297	3 46 20	39½
					(3) H. J. Cox, 2½ h.p. Forward.	2	56	69	339	3 55 56	38
1912	Capacity limit: 350 c.c. for all types.	9	16	25	(1) W. H. Bashall, 2½ h.p. Douglas.	2	60.7	60	350	3 46 59	39.65
					(2) E. Kickham, 2½ h.p. Douglas.	2	60.7	60	350	3 51 36	38.86
					(3) H. J. Cox, 2½ h.p. Forward.	2	56	70	344	4 6 29	36.51
1913	Capacity limit: 350 c.c. for all types.	11	33	44	(1) H. Mason, 2½ h.p. N.U.T.	2	60	61	344	5 8 34	43.73
					(2) W. F. Newsome, Douglas.	2	60.7	60	350	5 9 20	43.64
					(3) H. C. Newman, Ivy.	1	70	90	346	5 23 6	41.79
1914	Capacity limit: 350 c.c. for all types.	15	34	49	(1) E. Williams, 2½ h.p. A.J.S.	1	74	81	348	4 6 50	45.6
					(2) C. Williams, 2½ h.p. A.J.S.	1	74	81	348	4 11 34	44.7
					(3) F. J. Walker, 3 h.p. Enfield.	2	60	61	345	4 19 55	43.3

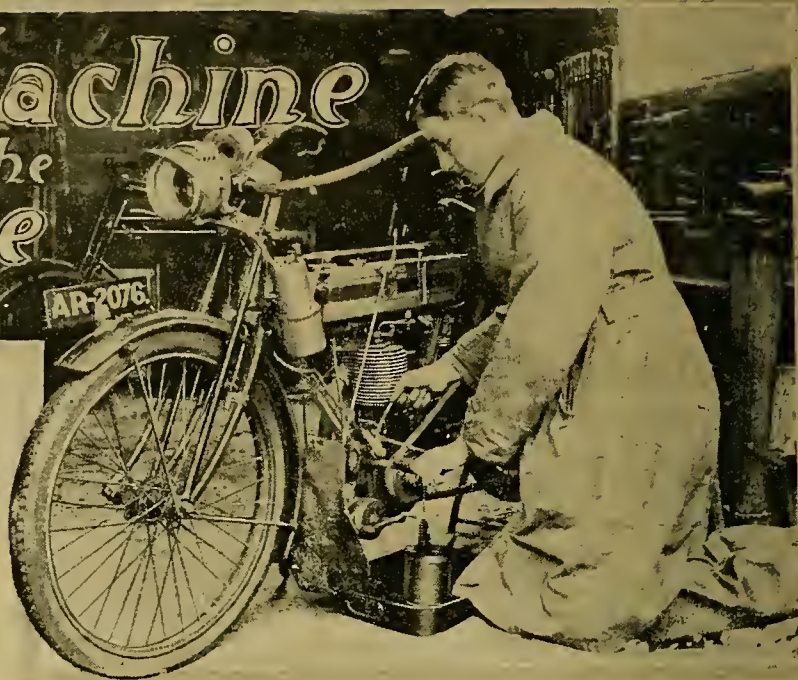
The Machine in the Garage

PREPARING FOR THE ROAD.

GIVEN fine weather motor cyclists should have a glorious Easter.

The weather has been so bad in the early part of the year and Easter comes so late in 1919 that we may look forward in pleasurable anticipation to days of sunshine. It will also be an exceptional holiday; the war is over, there is a spirit of freedom about, and it will be enjoyed all the more, because the motor cycle has been denied to so many during recent years. There is only one fly in the ointment, and that is the roads, which, in many places, are not good, but we are better off in this respect in England than elsewhere, and, provided the rough stretches are taken easily, no troubles should be experienced.

Now, troubles are avoided by care in the motor cycle house, and all the time possible should be spent in preparing the machine for the road. The first thing to do is to clean it down thoroughly. Begin with the engine, and, with a good supply of paraffin and brushes, remove oil and road dust until all is scrupulously clean. Special engine cleaning brushes can be obtained from most dealers, but often an old stiff paint brush is better, as it will more easily reach the nooks and crannies where oil and dirt collect, as it is usually not too thick at the end. A cycle cleaning brush of a kind sometimes, we believe, sold as a bottle brush, is very useful. The small flat end is good for cleaning inaccessible places on the engine, and the long narrow part is specially adapted for all other parts of the machine which are difficult to reach. Paraffin is unfortunately expensive, but it is the only convenient medium for removing grease and oil at the present time. There is no need to polish the machine until it is ready for the road, the object of cleaning

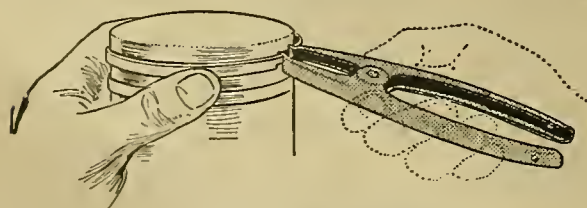


being to render the motor bicycle pleasant to work upon, to ensure parts working freely, and to reveal to the owner those defects which are only apparent through careful examination. In the cleaning process the rider is brought into intimate contact with his mount, and, as he proceeds, he comes upon loose nuts, badly working control wire, improperly adjusted tappets, a loose steering head, and other such defects which, if not put right at home, may cause delay or serious trouble, on the road.

If the machine has been stowed away for some time, it is almost certain that, in consequence of months of abominable weather, the magneto rocker arm is stuck up owing to the fibre bush having swelled through damp. The object of this bush is not generally known; it is not for insulating purposes, but it is made of fibre because this is the only suitable material which will allow the rocker arm to work for long without lubrication. Consequently no oil should be placed on the rocker spindle, as it only aggravates the trouble. A piece of emery cloth wrapped round a match and worked through the bush may effect an improvement. The tang of a file may be used in an emergency, but usually it is of too steep a taper. The best method is to use a special reamer made to size. Such a tool was once placed on the market by Simms Motor Units, but was withdrawn as there was apparently no market for it.

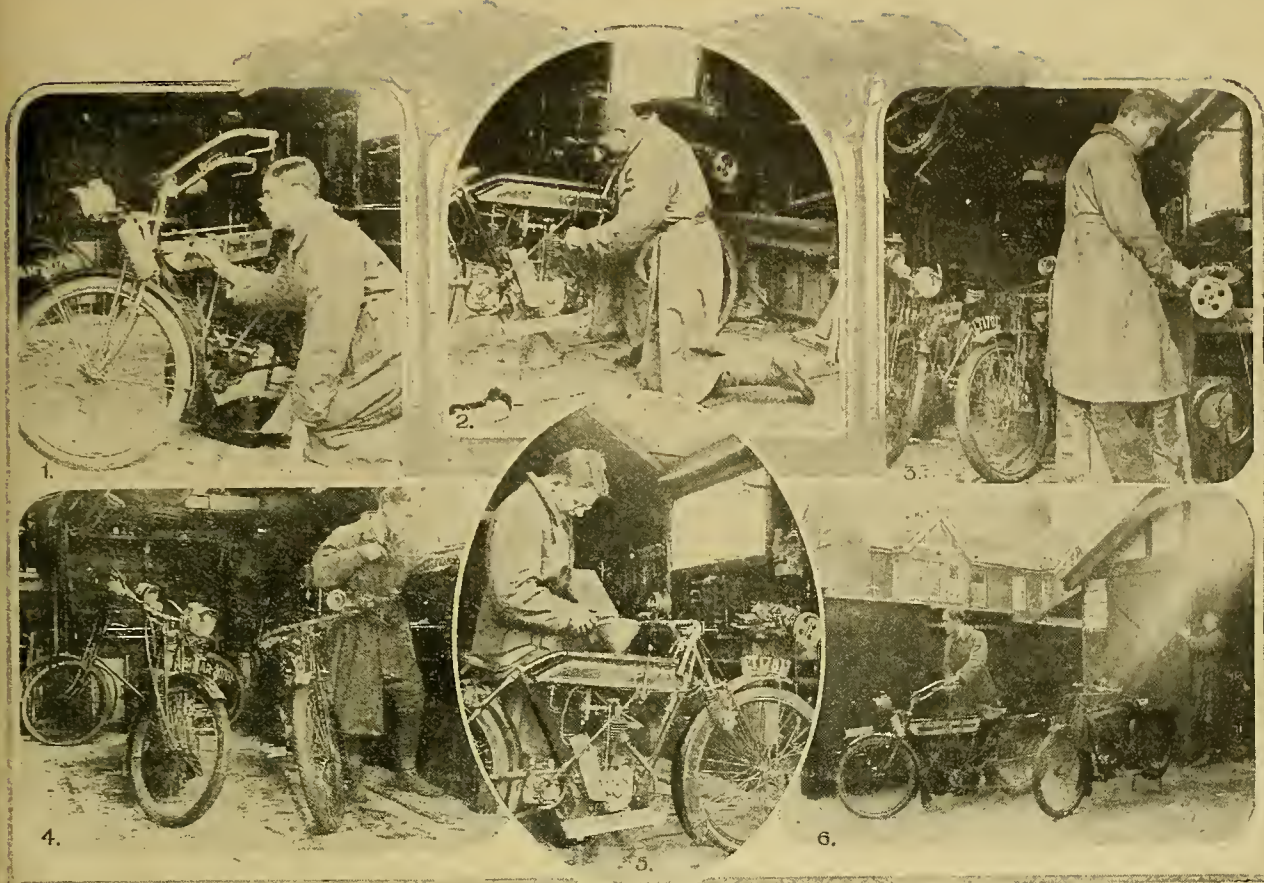


A magneto spanner fitted with a fibre bush reamer.



A special tool for opening piston rings.

Now that so many motor bicycles are being taken out of store and being made ready for the road again, it would seem that this simple little device would be especially welcome. It consists of a tiny D-shaped reamer made accurately to size and riveted on to a magneto spanner in the same manner as the gauge usually attached to this tool.



- (1) Cleaning inaccessible parts. A narrow brush is convenient for this purpose. (2) Every part should be examined.
 (3) Using the grinder. Note the pedal cycles hung overhead so as to be out of the way.
 (4) Making a cutter out of an old mowing machine blade. (5) Filling up. The modern motor bicycle has large filler caps and so a good-sized funnel can be used. (6) Ready for the road.

While paying attention to the magneto it is advisable to trim up the platinum points, set them to break .4 mm., and touch up the carbon brush and clean the collector ring. If chain-driven, the tension of the magneto chain should be adjusted when necessary, for a slack chain means late ignition.

The cylinder and piston should be cleaned of carbon and the valves taken out and examined. It is also advisable to wash out the crank case with paraffin and insert at least three charges of oil.

Attention to Valves.

It is almost certain that the exhaust valve will need attention, and if it is in bad condition it is best to take out the "pits" in a lathe by taking a slight skim off the face, or if no lathe is available put the valve in a bench drill, get someone to turn the handle, and hold a piece of emery cloth at the correct angle against the valve face until all trace of pits has disappeared. Then grind the valve on to its seating with grinding compound, and if it is thought necessary to give a very fine finish, complete the job with rouge. If the whole of the grinding is done in the cylinder it is a long and tedious process, resulting in much wear of the seating.

Attention should be paid to the strength of the valve springs, and if weak they should be renewed. The rings should be removed from the piston and replaced

if badly worn, the ring grooves being carefully cleaned at the same time, but if the rings are free they are best left alone. A useful tool can be purchased for opening the rings, after which they may be slid off or on to the piston, or if no special tool is handy they may be removed by placing three slips of tin vertically at equal intervals round the piston, and sliding the rings on these. The novice must remember that piston rings are exceedingly brittle.

The carburetter should be cleaned and the controls carefully examined, and a spot of oil on the Bowden wires where they enter their outer casings is advisable.

When the engine has been reassembled it should be run for a minute on half throttle or less, and then the valve tappets may be adjusted to give a clearance about equal to the thickness of the blue cover of *The Motor Cycle*. A complete overhaul should, of course, include taking down all ball bearings in the bicycle parts, washing them in paraffin, replacing any broken balls, and carefully adjusting the bearings.

To Adjust the Head.

To test the adjustment of the steering head the rider should stand astride the saddle and try to lift the machine by raising the handle-bar grips. It is almost certain that plenty of play will be found, which, of course, should be taken up. This is an important

The Machine in the Garage.—

point which is far too often neglected, and few appreciate that it is advisable to test the head adjustment every few hundred miles. The head is a part of the machine which has to put up with heavy stresses, especially at the present time when so much riding has to be done over rough roads, and neglect means worn ball races or perhaps more serious trouble.

Change-speed Gears.

Now, as regards change-speed gears. The modern countershaft gear box is likely to need little attention save lubrication, but care should be taken that the gears engage properly. In the case of hub gears it is most essential to see that the bracket on which the change-speed lever is mounted is firm, otherwise the gear wheels will not mesh properly and will suffer damage. A useful item in the motor cycle house is a force feed oilcan. This type is vastly superior to the ordinary kind, as it causes the oil to be forced right into the bearing, and is especially valuable in lubricating such points as wheel bearings and spring fork links. The rider should be careful to oil all moving parts such as links, brake rod joints, Bowden control stops, etc.

Next, the tyres having been removed, the rims should be cleaned and painted. It is most unwise

to start a holiday on bad tyres, and great care should be exercised in seeing that both covers and tubes are sound. All nuts should be examined, and last, but not least, the lamps should be overhauled. The best plan when an acetylene generator has been neglected for a long time is to place it and all its parts in a bucket of water and leave them there for an hour or so, then remove all trace of residue by scraping and by the aid of a stiff brush, and dry thoroughly before filling. It is most essential to see that the lamp is clean, the filter should be taken apart, and the gas passages should be clear. Remove the burner and blow it through with a tyre pump.

Accessories and Fittings.

Finally, the motor cyclist should cast an eye over his accessories and fittings, look to his speedometer drive, and see that the pinions are not meshing too deeply, and that the speedometer itself, the horn, mirror, and watch are firmly in place. Then, after a final polish, the motor cycle is ready for the Easter trip. After attention such as is suggested a no-trouble "non-stop" run may be anticipated. Time spent in the motor cycle house is time well spent. It is a splendid cure for brain fog, and well rewards the rider who indulges in this form of relaxation.

AILETTE.

The Principal Motor Cycle Records existing on April 3rd, 1914. (See article on page 324.)

Class.	Duration or Distance.	Date.	Rider.	Cyls.	Machine.	Bore and Stroke.	C.C.	Record.	Speed, m.p.h.
A.	Flying km. ...	17/ 4/14	W. A. Jacobs.	1	Singer.	65×75	249	38½s.	57.65
Under 250 c.c.	Flying mile ...	31/10/11	N. D. Slatter.	1	Alcyon.	62×82	247	1m. 1½s.	58.63
	1 hour			1				43 miles 850 yds.	43.48
A1.	Flying km.	26/ 8/11	H. Martin	1	Martin-Jap.	76×59.5	270	33.68s.	66.42
Under 275 c.c.	Flying mile ..	23/ 9/11	"	1	"	"	"	55.60s.	64.75
	1 hour		"	1	"	76×60	272	54 miles 310 yds.	54.17
B.	Flying km.	19/12/12	S. L. Bailey.	2	Douglas.	60.9×60	350	30.8s.	72.63
Under 350 c.c.	Flying mile ..	19/10/13	G. E. Stanley.	2	"	60.9×60	350	51.4s.	70.04
	1 hour			1	Singer.	75×79	349	62 miles 1,199 yds.	62.68
C.	Flying km.	6/ 4/14	D. R. O'Donovan	1	Norton.	79×100	490	27.6s.	81.05
Under 500 c.c.	Flying mile ..	6/ 4/14	"	1	"	"	"	45.4s.	78.60
	1 hour	15/10/12	G. E. Stanley.	1	Singer.	85×88	499	67 miles 782 yds.	67.44
D.	Flying km.	6/ 4/14	D. R. O'Donovan	1	Norton.	79×100	490	27.6s.	81.05
Under 750 c.c.	Flying mile ..	6/ 4/14	"	1	"	"	"	45.4s.	78.60
	1 hour	15/10/12	G. E. Stanley.	1	Singer.	85×88	499	67 miles 782 yds.	67.44
E.	Flying km.	2/ 5/14	S. George.	2	Indian.	82.5×93	998	23.93s.	93.48
Under 1,000 c.c.	Flying mile ..	11/ 8/11	C. R. Collier.	2	Matchless-Jap.	90×78.4	"	39.40s.	91.37
	1 hour	21/11/11	A. J. Moorhouse.	2	Indian.	82.5×93	"	70 miles 1,388 yds.	70.78
F.	Flying km.	7/ 2/14	A. C. Starace.	2	N.S.U.	54.5×75	349	43.8s.	51.07
Under 350 c.c. with sidecar.	Flying mile ..	13/ 8/14	T. B. Haddock.	2	"	"	"	1m. 12.4s.	49.72
	1 hour			1	A.J.S.	74×81	348	41 miles 757 yds.	41.43
G.	Flying km.	6/ 4/14	D. R. O'Donovan	1	Norton.	79×100	490	34½s.	64.65
Under 500 c.c. with sidecar.	Flying mile ..	18/10/13	C. G. Pullin.	1	"	"	"	58s.	62.07
	1 hour			1	Rudge.	85×88	499	52 miles 764 yds.	52.43
H.	Flying km.	6/ 4/14	D. R. O'Donovan	1	Norton.	79×100	490	34½s.	64.65
Under 750 c.c. with sidecar.	Flying mile ..	18/10/13	E. B. Ware.	1	"	"	"	58s.	62.07
	1 hour			2	Zenith-Jap.	76×82	744	56 miles 542 yds.	56.30
I.	Flying km.	17/ 5/12	G. F. Hunter.	2	Zenith-Jap.	90×77	986	30.76s.	72.72
Under 1,000 c.c. with sidecar.	Flying mile ..	17/ 5/12	F. W. Barnes.	2	"	"	"	51.35s.	70.11
	1 hour	18/10/12	E. B. Ware.	2	"	76×82	744	56 miles 542 yds.	56.30

QUESTIONS AND REPLIES

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C.4, and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

Advanced Prices.

? I placed an order with a local firm for an 8 h.p. sidecar for 112 guineas. I gave a deposit of £5. I got a letter to say that there was an advance on the price of eight guineas, which I would have to pay. I shall be greatly obliged if you will tell me whether I shall have to pay the extra.—C.J.

Unless your receipt for the £5 states the price to be 112 guineas, we fear you will have a poor case. It is more than likely that the firm in question print their conditions in the catalogue or on a slip attached to their receipts covering this point. If, however, your receipt states definitely the price, and there is no mention made of possible advances, you can hold them to that figure.

Removing the Timing Pinion.

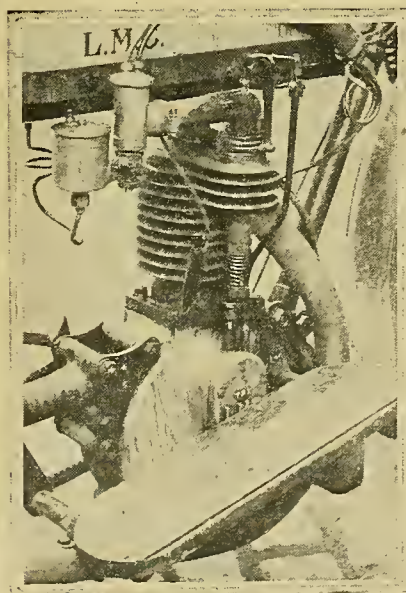
? (1.) I have a 1911 $3\frac{1}{2}$ h.p. Bradbury, which I am overhauling. Will you kindly tell me how to remove the small pinion which drives the timing wheels?
(2.) The valve rocker arms are worn into fairly deep holes, especially the rocker for the exhaust valve. Can this be remedied by putting the little steel tappet adjuster caps over the lower end of the tappet stem? (3.) What is the correct valve setting for this machine? —E.R.W.

(1.) The small pinion is secured by means of a nut. This nut should be removed, and it can then be seen if the pinion is keyed on. If it is keyed it may be withdrawn by the aid of a small tool drawer, obtainable from such firms as Bransom and Kent, 70, Great Eastern Street, London, E.C.2. and Lake and Elliot, Ltd., Albion Works, Braintree, Essex, etc. If, however, it is screwed on it will require a special tool, which the makers may supply, for removing it.
(2.) The tappet adjuster caps would certainly improve matters, but a new rocker arm should be fitted if possible.
(3.) Time the engine in the following way: *Valves*.—Set the exhaust valve to close just after the completion of the exhaust stroke. It will then commence to open when the piston is about one-seventh of the length of the stroke from the bottom of the firing stroke. The inlet should commence to open as the exhaust closes, and remain open for one complete stroke of the piston, or while the flywheels turn through 180°. *Magneto*.—Place the piston exactly on top of the compression stroke, and connect up the magneto with the points just about to break and the ignition lever two-thirds retarded.

A Faulty Mixture.

? I have recently obtained an old Kerry motor cycle, which has an automatic inlet valve and a B. and B. carburetter. It starts up easily with the air closed and the gas about half open, but when I mount the machine and open the throttle to three-quarters and begin to open the air slightly the engine stops. I have put a little tap in the induction pipe, and if I open it slightly the machine gains a little more speed. Can you kindly give me some advice on the matter?—L.E.M.

It looks very much as if you are opening the air too soon. Continue running for a short time before you open the air, that is, until the machine has attained a little speed and has become warmed up, then open the air slightly, giving the engine as much as it will take. If you find the engine runs better with the tap in the induction pipe open, then leave it open, for more air is required.



An ancient L.M.C., which originally had an automatic inlet valve, converted by Mr. R. R. Harris, a Coventry motor cyclist. The cam for the inlet was welded on to the second wheel in the magneto train. Most details of the additions are to be seen in the illustration. The alterations have effected a great improvement in the power of the engine.

Difficult Starting.

? I have a large, low compression, single-cylinder engine on my runabout, which is often difficult to start. The magneto runs at engine speed and is timed to fire just before the top of the compression stroke. Will it be safe and an improvement to adopt the following method of starting up: Shut off the extra air lever of the B. and B. carburetter and lead a small copper pipe connected with the acetylene generator through one of the holes of the fixed air intake; turn on the water and then crank the engine?—J.P.S.

Acetylene is not very reliable in its action, and it would be safer to use a gas jet to enable you to start easily. Just push a piece of rubber pipe from a gas bracket up the fixed air inlet of the carburetter, leaving the throttle and air a little way open, and the engine will start quite easily.

Old Carburetters.

? I have an 8 h.p. J.A.P., and shall be very pleased if you can help me out of my difficulty. The original carburetter was lost, and having an old Triumph carburetter by me (two-barrel type) I have fitted this to the induction pipe, but cannot get the bicycle to run except with the control levers in one position, that is, shut right off. The first time taking the machine out for a test after a complete overhaul it started off at about 25 m.p.h. through the throttle not closing more than half way with the lever in the off position, and the least touch of the air lever increased the speed tremendously, and the only means of keeping down the speed to the above limit was to keep the air lever off and lift the exhaust. I have adjusted the throttle slide to come to the bottom of the barrel, the only position in which I can get a start. Once started, moving either throttle or air levers causes it to misfire and eventually stop (simply misfiring, not blow-backs or popping), so I have only one speed. Variation has to be obtained through the exhaust lifter, which I know you will say is detrimental to the valves.—A.E.S.

There is evidently something wrong with the slides if it will not take extra air—or possibly there is considerable air leakage between the carburetter and the cylinders. Have you tried a larger jet? We cannot suggest anything else without examining the machine or the carburetter, but we should advise you to get a new carburetter.

A Stationary Engine.

? I have bought a single-cylinder, vertical water-cooled motor cycle engine, of 3in. bore \times 3 $\frac{1}{2}$ in. or 3 $\frac{1}{2}$ in. stroke. It has four legs on it, and has been running a workshop. I should like to adapt it for driving a dynamo. (1.) Will this type of engine run for, say, six hours? (2.) What should be the size and weight of an extra outside fly-wheel, to be added for steadier running for the dynamo; also what should be the approximate capacity of the water tank—ten gallons? (3.) At what speed would it be advisable to run the engine continuously—about 1,000-1,200 r.p.m.; and what would be the possible horse-power on gas and paraffin? (4.) How often, approximately, should a pumpful of oil be given, in minutes at, say, full load?—D.B.

(1.) The engine in question would be quite satisfactory if properly cooled. (2.) The flywheel should be about 20 lb., while the water tank should hold at least ten gallons; more, if possible. (3.) About 1,000 r.p.m. On gas or paraffin it would develop about 2 $\frac{1}{2}$ h.p. at 800 to 1,000 r.p.m. (4.) As to how often you should lubricate depends upon the cooling very largely. We should say approximately a pumpful every ten minutes.

Magneto L.T. and H.T.

? Will you be kind enough to inform me how to distinguish a high-tension magneto from a low-tension magneto? We have an internal combustion engine which requires new parts, and even the makers of the engine are not sure whether it is high or low-tension. It has a Bosch magneto, type D.U.2.—CAPT. R.E.

There are two kinds of low-tension magnetos, both of which are distinguishable from the ordinary high-tension type. The older type of low-tension magneto was somewhat similar to the high-tension type in form, but had no contact breaker. The armature, instead of rotating, oscillated, and instead of a contact breaker there was a make and break inside the cylinder of the engine. The later type was more like the modern high-tension magneto, but was supplied with an additional coil which converted the current from a low to a high-tension one. Therefore, it was really a high-tension installation, though the magneto itself produced a low-tension current. The high-tension magneto can be easily distinguished by the wiring, which merely consists of a low-tension switch wire (sometimes not even this) and a high-tension wire to the sparking plug. The magneto referred to is a high-tension one.

Maximum Pressures.

? Will you please let me have some data which will enable me to calculate the maximum pressure resulting from the explosion of a proper mixture of petrol and air, with a given ratio of compression; or can you recommend a book touching on this subject?—A.J.

We are not in a position to furnish you with data for calculating maximum pressures, as such data entirely depend on circumstances, and are taken from the

particular engine under test. Innumerable factors have a bearing on the result, such as suction temperature, valve setting, size of induction pipe, compression pressure, stroke, etc., and over the whole range of the above factors the speed of the engine has a governing effect. We may mention that an average figure for explosion pressures in an internal combustion engine is about 350 lb. per square inch, but, on the other hand, it has to be borne in mind that an explosion of petrol and air in a closed vessel will produce pressures running up to some tons per square inch. There is no book solely devoted to such a subject. You should read a book on internal combustion engine design, particularly those parts dealing with the thermodynamics of the internal combustion engine.

READERS' REPLIES.

Uneven Firing.

Seeing in *The Motor Cycle* of March 13th that a fellow motorist, "J.G.," is having trouble with his 5.6 h.p. Indian with uneven firing, I might state I have a 5.6 h.p. Indian, and had exactly the same trouble, and I could scarcely move with a sidecar, except in low gear; also when solo I could not run slowly, but when going about 30 m.p.h. it was O.K. I think if he gets his magneto looked to it will put paid to all his troubles. I had mine overhauled, and I can now take a sidecar and two passengers without any trouble whatever. If it is of any assistance to our friend I can give him the address to which to send his magneto, where his troubles will be attended to, as mine were. The condenser in my magneto was punctured, and this caused erratic firing. I also had great difficulty in starting, but now I can start from cold in less than six yards.—C. H. BROCKEN.

Chain Bolt Working Loose.

In your issue of the 20th, a complaint is made of fastening pin nut coming loose and falling off, and you suggest that any mechanic will drill a hole through the end of the bolt for a split pin. As this chain was $\frac{1}{2}$ in. \times $\frac{3}{8}$ in. I should say it was no easy task, as these bolts are always hard and necessarily so, too, and, even if this were not so, the pin would be very small to be drilled to take a split pin. The obvious thing to do would be to have a spring coupling, such as Renolds fit. I have always found this to be perfectly reliable on chains up to $\frac{3}{4}$ in., such as the A.J.S. fit. I have been running a Morgan the last two years, and have had no end of trouble with these coupling pins, and I can say it is no light task when the back wheel has to be withdrawn to take two of these out and refit. As for burring over the end with a hammer, that is the last resource I should adopt, as not only is the pin difficult to withdraw on the road, but a new pin and link would be required every time. I have been in correspondence with the Renold firm, and I am informed that they now equip the $\frac{1}{2}$ in. \times $\frac{7}{8}$ in. chains which are fitted on the Morgan with these spring links, and I think it will be a great boon to the riders of those excellent runabouts.—MORGANITE.

RECOMMENDED ROUTES.

BARNESLEY TO LIVERPOOL.—J.H.C.G.

Barnsley, Penistone, Woodhead, Manchester, Eccles, Cadishead, Warrington, Prescott, Liverpool. This route probably involves much traffic and tramlines.

NORWICH TO LEAMINGTON.—M.A.C.

Norwich, Wymondham, Attleborough, Thetford, Barton Mills, Newmarket, Cambridge, Eltisley, Eaton Socon, Bedford, Northampton, Daventry, Southam, Leamington.

UXBRIDGE TO WEST NORWOOD.—B.L.B.

Uxbridge, Southall, Hanwell, Ealing, Acton, Shepherd's Bush, Fulham Park Rd., High Street (Wandsworth), Trinity Rd., Tooting Bec Common, over Streatham Common, West Norwood.

NEWCASTLE TO BLACKPOOL.—W.F.

Newcastle, Durham, Bishop Auckland, Barnard Castle, Bowes, Brough, Kirkby Stephen, Sedburgh, Kirkby Lonsdale, Lancaster, Garstang, Poulton, Blackpool. Approximately 115 miles.

UXBRIDGE TO BEDDINGTON.—B.L.B.

Uxbridge, Southall, Hanwell; after passing the asylum turn right and go across country to Brentford, Kew, Richmond, Petersham, Kingston, Norbiton, Malden, Cheam Common, Cheam, Sutton, Beddington.

COVENTRY TO SOUTH SHIELDS.—J.H.

Coventry, Nuneaton, Atherstone, Ashby-de-la-Zouch, Derby, Ripley, Chesterfield, Sheffield, Barnsley, Wakefield, Leeds, Harewood, Harrogate, Ripley, Ripon, Thirsk, Yarm, Stockton, Easington, Sunderland, South Shields.

CANTERBURY TO COVENTRY.—B.B.

Canterbury, Hockington, Sittingbourne, Chatham, Rochester, Gravesend, Dartford, Crayford, Woolwich, cross river to East Ham, Stratford, Leyton, Walthamstow, Tottenham, Edmonton, New Southgate, Chipping Barnet, St. Albans, Dunstable, Penny Stratford, Stoney Stratford, Towcester, Weedon, Daventry, Dunchurch, Coventry.

MANCHESTER TO LAND'S END.—E.F.

Manchester, Altrincham, Northwich, Tarporley, Whitchurch, Hodnet, Wellington, Bridgnorth, Kidderminster, Worcester, Tewkesbury, Gloucester, Cambridge, Stone, Filton, Bristol, Bedminster, Cross, East Brent, High Bridge, Bridgwater, Taunton, Wellington, Cullompton, Exeter, Okehampton, Lifton, Launceston, Bodmin, Mitchell, Redruth, Camborne, Penzance, Land's End.

EAST GRINSTEAD TO BOVEY TRACEY.—W.L.F.

East Grinstead, Felbridge, Burstow, Reigate, Dorking, Gomshall, Newlands Corner, Merrow, Guildford, Hog's Back, Farnham, Odiham, Basingstoke, Worting, Overton, Whitechurch, Andover, Weighill, Thruxton, Amesbury, Stonehenge, Depton, Wylve, Hindon, Mere, Bourton, Wincanton, Sparkford, Ilchester, Ilminster, Chard, Yarcombe, Monkton, Honiton, Exeter, Alphington, Chudleigh, Bovey Tracey. Distance approximately 180 miles.

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Sidecar Brakes.

OF the many machines designed as sidecar outfits, very few have embodied a brake on the sidecar wheel, and the 1919 model of a leading make upon which this was a feature before the war is now being re-introduced without it.

With the tendency for sidecars to be heavier as refinement after refinement is added, the necessity to equip the sidecar wheel with a brake appears to be obvious, especially when the average front wheel brake does not give the service it should.

It would appear that comparatively few experiments have been made by manufacturers, and, if the matter has been given consideration at all, the question has been dismissed as being one fraught with many difficulties. By others it is thought that, if one rear wheel brake is sufficient to hold a machine on a hill, the increased cost of production of the sidecar brake is not justified. This rather appears to be narrowing the margin of safety, as, if the back wheel brake fails to function, the driver has not complete control of the machine.

It is certain that a really satisfactory sidecar brake has yet to be evolved, and, although our own experience with sidecar brakes has been far from encouraging, we see no reason why a successful design should not be forthcoming if designers will give the matter proper attention.

We think one of the mistakes of the past has been the practice of having separate controls to the brakes on sidecar and back wheel, and also in so placing the lever that the former could be operated by the passenger. From actual experience we know it is most undesirable to permit the passenger to use the brake, as the least pressure upon the lever, if unexpected, instantly causes the machine to swerve to the left.

It is clear that for a sidecar brake to be successful it must be interconnected with the rear wheel brake, and that it must have a

balancing or compensating action, and an easy and accurate means of adjustment. Perhaps it may be found beneficial so to adjust the brakes that more pressure is applied on the rear wheel of the cycle than on the sidecar wheel.

Spare Parts.

IT may be admitted that the motor cycle manufacturer, like many another, is meeting with difficulties in his endeavour to satisfy all who ride his machines. The reasons are well-known to all, and need not be enumerated in detail. There is one point to which it seems to us, however, that rather more attention should be given, and that is the prompt supply of spare parts. We have had, of late, sundry complaints from our readers of failure to supply some small part or other which is actually in stock at the moment. Annoyance has also been caused by the despatch, after about a week's delay, of a *pro forma* invoice, followed later, after the money has been forwarded, by the information that the required part is not in stock and cannot be manufactured.

One correspondent, writing under the spur of some irritation, points out that a manufacturer's responsibility does not cease with the sale of a motor cycle. "A machine," he says, "may be the fastest, cleanest, lightest, handiest, most powerful, cheapest, quietest, and best climber in the whole wide world, but when it stands idle for the six finest weeks in the whole year, waiting for a fork spring or some other trivial but vital part, it is not one-tenth part as fast as $1\frac{1}{4}$ h.p. Dinkie, nor so satisfactory, and the owner will never buy another, and he will take care to spread the news among his friends, and will eventually sell the machine to his enemy."

It cannot be denied that there is justice in this complaint, but happily it is exceptional. It should be remembered that the prompt supply of spare parts will go a long way towards securing the order for next year's machine.

A FOOT-CONTROLLED THROTTLE.

A Device of Particular Interest to Those who have Lost an Arm.

SOME time ago, after a little experimenting, I constructed a successful combined hand and foot-operated throttle on my Lea-Francis motor cycle, and it may interest others who are thinking along similar lines to hear how this was carried out.

Necessarily, the method of procedure at the carburettor must vary slightly with different makes of carburetters. Although the Binks three-jet was the one to which this description applies, no doubt similar construction with slight modification would apply to other makes.

The first thing to be done was to lift the throttle by two independent Bowden wires, the sketch (fig. 1) showing how this was accomplished.

The original Bowden wire was removed from the throttle and a $\frac{1}{4}$ in. diameter brass rod substituted, with a small collar soldered to the bottom end to hold it in the throttle. To the other end was soldered a rectangular brass cross-head, drilled on either side with $\frac{1}{8}$ in. diameter holes to take the two Bowden wires from the hand and the foot controls. Over this, and soldered to the screwed cap of the throttle barrel, is a U-shaped piece of brass, serving as a guide for the cross-head and holding the outer Bowden cables at the top, the inner cables passing through two $\frac{1}{8}$ in. diameter holes. The inner cables have two small brass nipples soldered on in the usual way, after they have been passed through the cross-head. One cable is then led to the handle-bar, the other over the top of the tank and down to the right-hand



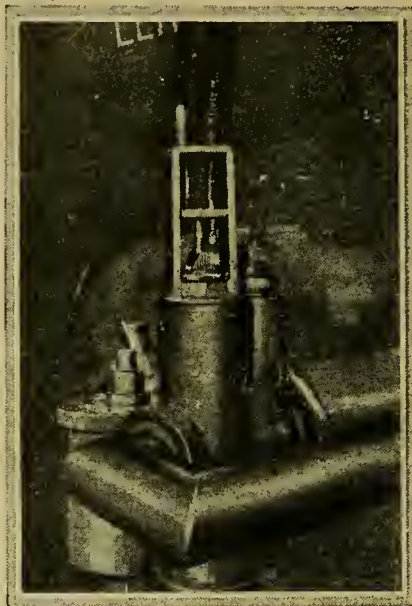
The pedal control fitted to the footboard.

footboard for the hand and the foot control respectively.

Fig. 2 shows the lever or accelerator pedal, as it would be called, on a car—fitted on the end of the footboard to the right of the brake pedal.

This was easily built up from $\frac{3}{4}$ in. square mild steel rod by acetylene welding. The vertical pillar was first welded to the base plate, then the horizontal piece to the top of this again. The

lever itself is a piece of the same material pivoted, by a $\frac{1}{4}$ in. Whit. bolt, to the vertical pillar, and held up to the adjusting screw by a flat spring. Two small steel screws hold the spring to the underside of the lever, after the



Showing how the throttle is lifted by two independent Bowden wires.

Bowden wire is passed through, on which is the usual nipple. Adjustment is carried out by the set screw and lock-nut shown.

It will be noticed that the extra air lever is not interfered with in any way, but, as a matter of fact, on this machine it is rarely used, the carburettor being quite automatic.

A little practice is required at first to get the "touch" of the pedal, but when this is overcome the machine can be controlled very easily, and the brake and clutch pedals of the Lea-Francis

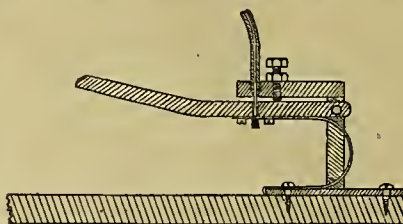


Fig. 2.

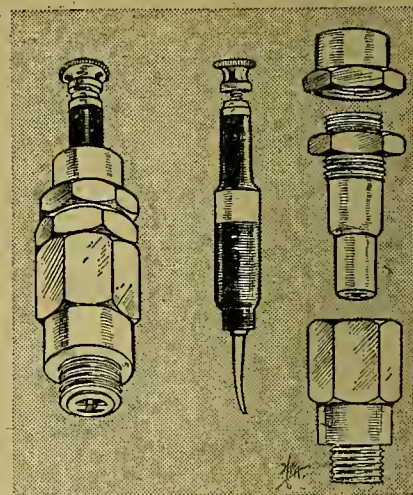
being right and left respectively, the control is exactly like a car. Of course, more accurate control can be obtained with a sidecar fitted, but even solo I find it very useful.

This system might be very useful to a motor cyclist who has been so unfortunate as to have lost the use of an arm or hand, as it would enable him to dispense with the hand control altogether.

I have been riding with the fitment mentioned for several thousand miles, and would not care to be without it, and although the hand control is always ready for use if required, I consider it has been well worth the energy and time expended on fitting. R.

THE M.A.C. SPARKING PLUG.

A SPARKING plug embodying one or two unusual features is the M.A.C., manufactured by the Mechanical Accessories Co., Oak Street Works, Preston, Lancashire. The central electrode is made of nickel steel $\frac{1}{16}$ in. thick with a shoulder $\frac{5}{16}$ in. thick. The insulator consists of some 280 mica washers compressed tightly together, the whole of the mica being held in position by a small brass ring and washer, and cannot be moved. This insulator is turned to a standard size so as to fit the thimble, which is turned out of the solid brass with a shoulder to fit the bottom body made with a taper thread



The M.A.C. sparking plug.

so as to form a perfectly gastight joint. The electrodes, made out of $\frac{1}{16}$ in. nickel steel, are spun on the bottom of the thimble, and are easily cleaned inside and outside after unscrewing the thimble from the bottom body. A brush is supplied with these plugs for this purpose. The bottom body is made out of solid brass, and need never be removed after once being put into the engine, as the thimble portion is the only part necessary to be taken out to be cleaned. The top body is also made of brass, and screws with a taper thread on the top of the thimble, binding the insulator, and making the whole plug gastight. The adjustment of the spark gap is effected in a somewhat novel manner. The central electrode is slightly bent, so that, by loosening the thimble, the central electrode may be turned and placed in the most suitable position.

Occasional
Comments

The Ratios of a Four-speed Gear Box.

THERE has been much discussion lately as to the merits of four-speed gear boxes as a class and as to the plotting of their ratios. Some enthusiasts hold that the ideal box should have a couple of close-set top ratios—e.g., $3\frac{3}{4}$ and $4\frac{1}{2}$ to 1—the former being used under easy conditions: e.g., speed bursts, gentle slopes, or with a following wind. Apart from the difficulty of securing two direct drives, such a series is fallacious. A $4\frac{1}{2}$ top is perfectly satisfactory, and the rider who possesses both will never be quite sure which is engaged unless he is extremely familiar with his machine or glances down at his gear lever. To my mind the sole justification of a four-speed box is the provision of a very low emergency ratio, running well into double figures. Whilst one cannot pretend that a 12 or 15 to 1 ratio is ever a necessity, it is occasionally a convenience. It permits you to dodge through a flock of sheep on the trough of Sutton Bank; it is handy in any freak climbing stunts you may be disposed to tackle; it facilitates starting from rest on severe inclines; it enables a small engine to pull a sidecar up any hill; and, last but not least, it is indispensable to many Overseas riders, who have to use tracks which are really unfit for motors. Thus for home use no machine need be “crabbed” because it has only three speeds: but the manufacturer who can crowd in an extra ratio without extra charge deserves every encouragement, and will certainly receive it from the export trade.

The Size of Petrol Tanks.

THE capacity of a petrol tank is usually dictated by one of two considerations. Some manufacturers think out their frame dimensions and stick in the largest tank which can be accommodated and will look presentable. Others make a great talking point of the fact that their tanks hold exactly two gallons, the presumption being that it is the correct size for taking an entire can, whilst it is implied that surly garages will not supply less than a whole can, which is often true. Unfortunately, our tanks run dry—if we are careless—miles from a garage, but if we are careful we fill up before the tank is empty, and so the fact that an empty tank will take two gallons is of no value whatever. Every practical rider knows that garages dislike “splitting a can,” partly because few cans contain full measure, partly because spilling and evaporation cause losses when a can is split, partly because customers dislike buying from a can which was opened before their arrival. It follows that the ideal tank capacity is not two gallons, but *two gallons plus a reserve* sufficient to propel the machine ten or twenty

miles—say $2\frac{1}{4}$ gallons in all. This tank is by no means cumbrous or unsightly on machines of 500 c.c. or over, nor even on small machines which possess scientific lubrication systems. If the reserve quarter gallon is tapable only by varying the setting of a three-way petrol tap, we could all blaze happily along till the engine began to spit, then put the petrol cock in No. 3 position, and buy a whole can of spirit at the next garage. Under the existing practice we have to take a precautionary peep at the tank every few miles, and then face a *fracas* with a surly garage hand. The remedy for both troubles is so simple that it should be applied to all large machines.

Another Puzzle.

EQUALLY mysterious is the protracted survival of a variety of obstacles to the withdrawal of wheels. Since Woodgate Bros., Surridge, and other vendors of quick-drying and tenacious solutions came to our rescue, we do not take our wheels out of the frame with such frequency as was forced upon the pioneer riders. Still, they have to come out sometimes, and even in this year of grace it is often quite a job to disengage them. I am not thinking of such snags as front wheel brakes, or chain cases: the difficulties which I have in mind often outlive knock-out spindles and other patented devices for making wheels detachable. One snag is the mudguard, which—whether of the front or back variety—is quite likely to foul the wheel when you are entering it into the forks, unless the machine is raised far higher than the makers' stands can lift it, unless some such common-sense device as the Rudge hinged guard is fitted. Another snag is the downward pointing eye in some fork ends. At any rate, the presence of a friend to hoike the machine a few inches higher than the stand can manage is often of vast assistance in replacing a wheel. Here, too, the remedy is obvious.

An Expensive Toy.

I HAVE always found it difficult to take the motor scooter seriously, but you can never say what is going to happen when society people unearth a new fad. The picture papers put a camera man in waiting; then the universe begins to gossip, and the toy has gone into mass production before you have time to look round. The motor scooter has hesitated for some time between remaining a roller skate or expanding into a lightweight motor bicycle. At the moment it is coquetting with the more ambitious alternative. It has certain obvious advantages over, say, a Baby Levis or Triumph. It costs some £20 less at a time when cash is distinctly shy. It dodges the odium attached to pukka motor cycles in the eyes of the smart set. If it goes wrong, you can tuck it under

Occasional Comments.—

your arm or put it in a cab. In some parts of the country the police apparently permit it to curvet on the pavement. On the other hand, it can never, never be used for touring in its original form, and is unlikely to commend itself for trips exceeding five miles at the outside. My own verdict is that the scooter cannot stay where it is. It may ultimately shrink back to its original dimensions, and revert to being a sort of pocket motor bicycle for shopping purposes: or it may swell out into a form indistinguishable from the cheaper lightweights. In road practice, of course, the snag of these lilliputs is that at the best you have no power to spare, and tune is seldom well maintained. Consequently, their usefulness is strictly limited, and unusually dependent upon the owner's skill. The real novelty of the motor scooter, as compared with lightweights, is that it presents itself frankly as a boulevard runabout and nothing more: it has no Land's End-John-o'-Groat's nonsense about it. Will many people pay £20-£30 for it at that? Well, it is certainly nice to be independent of trams, tubes, and taxis within a five-mile range; and that is what the scooter offers us. Except as a fashionable novelty it will not tickle the people who whistle for a taxi on the slightest occasion; and you can do a lot of tram and tube transport for £30.

The Ultra-cheap Machine.

VARIOUS designers, manufacturers, and would-be riders have taken interest in my occasional mentions of the great demand for a very cheap motor bicycle. It seems quite clear from their opinions that those impecunious riders who would make the backbone of this new market will accept almost any machine of 500 c.c. which is cheap, reliable, and fairly comfortable. They will not be fastidious about the transmission—belts not objected to—or the artistic hues of the tank enamel, or the glitter of the plating. But it must be able to pull a sidecar, and should be tolerably fast as a solo mount; they do not want under-powered and dithery lightweights. Quite a number of firms are feeling their way in the desired direction, and all of them are up against one or more snags. For example, one concern

has worked out extremely economical methods of constructing the frame, tanks, guards, etc., but cannot hit on any method of evolving a sufficiently cheap engine. Another firm wants to knock £1 off the cost of the wheels, £2 off the ignition, £1 off the carburetter, and so on. In other words, an engineer may see his way to cheapen the component parts for the design of which he is personally responsible, but the saving on these is inadequate unless it is balanced by corresponding reductions in the price of parts which are made by other firms.

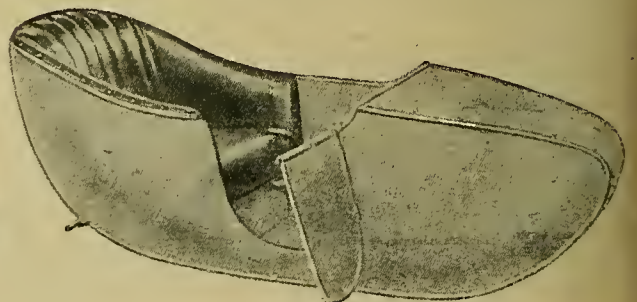
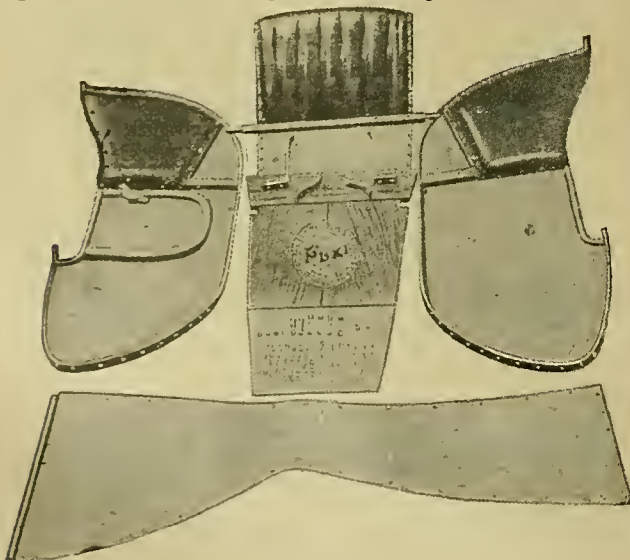
Some Side-Lights.

UNQUESTIONABLY the best prospect of, say, a £40 touring machine in 1920, ultimately reducible—as our finances stabilise—to £30 or £25, would come if a small group of specialists tackled the whole problem of design anew from stem to stern, as Ford did when he planned his car. In the meantime it is clear that this job cannot be half done. The “class” singles command £85 at the present minute; a simplified single at, say, £65 is hardly worth the making, but a simplified single at £40 would be as big a stunt as the Ford car. Before such a machine can be born, various specialists must break soil which is almost virgin. We can never get the £40 machine so long as we incorporate magnetos at £5, carburetters at 50s., and so on. It will not have hand-built wire wheels, but pressed metal wheels without wind-catching webs or discs. Its erection will not include the bolting into place of innumerable tiny gadgets, each of which is a separate job. This machine can be made, and will be made. At the moment it waits principally for:

1. A cheap engine.
2. A cheap ignition.
3. A cheap carburetter.
4. A cheap wheel.

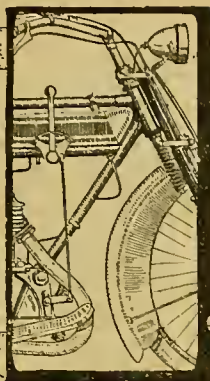
No. 1 implies a two-stroke or outside flywheel four-stroke. No. 2 demands something absolutely novel—perhaps a fixed firing point and a catalytic plug, or some such weird gadget. No. 3 might be managed by aluminium die casting, seeing how absurdly simple motor cycle carburetters are. No. 4 is not promising. Disc wheels in quantity might be cheap, but are unpleasant to ride under certain conditions: pressed steel artillery wheels are too stiff and too heavy. Nothing will happen till we get a big, wise firm genuinely interested; at present small outputs *de luxe* captivate all our manufacturers, and the handful who dream of big markets look Overseas to find them, ignoring the giant markets outside their own gates.

A sidecar produced by an American firm, and so designed that it may be separated into flat sections to facilitate compact packing for export trade.



IN THE FUEL WORLD.

A New Process showing
Great Promise.



FOR years the British motor industry has been deeply concerned over the supply of those fuels on which it is primarily dependent for its existence. Thirteen years ago, complaints of the high cost of petrol were rife, and experiments were conducted with alcohol, which, mixed with benzole, is an excellent fuel for petrol engines, but, although the trade and many private motorists saw the possibilities of the fuel, the Government either could or would not. And so, as a result of Excise restrictions, alcohol was effectively and permanently barred.

Benzole was the next palliative, and in 1913, when the price of petrol had risen to the unprecedented figure of 1s. 6d. per gallon, a certain amount of the home-produced coal product was on the market at a few pence cheaper. All motorists liked it—in fact they could do nothing else—but the benzole producers found a better market abroad, and most of the English-produced benzole went to Germany, where it developed the great dye industry and contributed to the accumulation of huge stocks of explosives!

A Promising Process.

The Del Monte process came next, and no one seems to know clearly why this gradually fell into oblivion, for its prospects were quite rosy. It was a thoroughly commercial proposition for the production of cheap motor fuel, and, if the truth ever becomes known, it may appear that the petrol combine was at the back of its early demise.

Then came the great upheaval of 1914, and with it the immediate disappearance of benzole from the market. The Government wanted all the benzenes it could get for the manufacture of explosives, and in some quarters it is believed that the war showed the Government the folly of its indifference to the long continued export of English benzole to Hunland. Petrol began to soar in price at an alarming pace, and a rationing system was introduced that added another sixpence a gallon, and ultimately had the effect of making motoring impossible to any but those who were directly engaged on "work of national importance," as the phrase went.

Now that the war is over, the authorities admit the real national importance of a home-produced fuel for road transport vehicles, and they are encouraging all enterprises that hold forth any serious promise of success. An experiment with alcohol is being conducted on London buses, and, if it is a success, it may be hoped that some relaxation of Excise restrictions will result, so that the artificially inflated cost of alcohol will undergo useful modification.

The Greenstreet Process.

A process that is entirely new to this country may be expected to fructify in the course of the next few months, and if it does the effect on the fuel situation as a whole should be considerable. Mr. Greenstreet has had working in America for some years his patent process for the conversion of heavy hydrocarbons into the lighter members of the same series, and also for the removal of all sulphur from fuels that have hitherto been unusable in internal combustion engines on account of their too great sulphur content, sulphur being injurious to both valves and cylinders.

From crude petroleum oil the process will obtain about 65% more motor spirit than has previously been possible, and the same holds true of its use with shale and coal tar oils. From substances as dissimilar as peat, sawdust, and coal tar by-products, a motor spirit of first-class quality has been obtained, and a useful feature of the process is that the boiling point of the resultant fuel can be controlled. In other words, the process will give a fuel to satisfy any reasonable stated requirements.

Peat is widely distributed in the British Isles and in other parts of the Empire, and great hopes are being centred in the promise of the Newfoundland peat fields.

The keynote of the process is high temperature intensive recovery, and reports on its working by experts whose opinions may be accepted with respect would appear to justify the claims that are made. Oil that has been discarded by the ordinary petroleum distillers as containing no more motor spirit—*i.e.*, crude oil from which the lighter members have all been extracted by methods in ordinary use—have been made to give a yield of as much as 40% of first-class motor spirit! The plant is comparatively simple and cheap, and can be erected almost entirely from materials which are likely to be in stock.

Expert Opinion.

Sir Boverton Redwood is a petroleum expert who has occupied a most important Government position with regard to fuels during the war, and upon his words unquestioned reliance may be set. His opinion of the Greenstreet process is that if it had been working and fully established in England before the war started we should have been *entirely independent of foreign imported fuels!* Negotiations for the full exploitation of the process in the whole of the British Empire are being conducted, and there should be further interesting developments to be recorded in the course of the next few months.



ADAPTING OLD CLOTHES FOR MOTOR CYCLE WEAR.

WITH the advent of spring, we of the weaker sex always give much thought to the suitability, or otherwise, of various types of dress. I remember seeing in the motoring press recently photographs of an American lady rider wearing a low V-necked blouse. This is unpractical and dangerous to health. To ride in such would be at least courting pneumonia, but, as I said before, the photographs were American, and funny things are done "over the water." After all, one can ride in unsuitable dress if one is so inclined. A footballer could play in evening dress. One must use one's own discretion; nothing teaches so well as experience, but the following ideas may assist the dubious.

The Question of Cost.

A friend of mine who rides a $2\frac{3}{4}$ h.p. Douglas in most weathers fancied a leather coat, but found that the price had soared since 1914 from a modest six guineas to fifteen, so this was ruled out and a substitute adopted. A quantity of washleather was bought and sewn inside an ordinary last season's long tweed coat; this method of lining was carried down each of the sleeves and found to be quite a success and completely windproof. This is a suggestion that anyone can carry out with time and patience, and, consequently, there is no need to resort to a tailor.

Woollen Coats.

Woollen coats are occasionally recommended. These might suffice on a warm day when pottering from street to street on a shopping expedition, but for real riding or touring are taboo. I ask any reader to recall walking in a woollen coat on a windy day; the open

texture is little protection, and one becomes miserably cold and uncomfortable.

Half-yard Remnant for a Cap.

The illustrations of the driver of the 4 h.p. Douglas combination show, I consider, a most practical "get up," and yet one can scarcely call it dowdy unless one is trying to be uncharitable. The tammie of tartan was made by the wearer from a half-yard remnant, and when pinned at the side it has the virtue of "sticking on." The Norfolk costume is durable, and can be covered in extreme cold by the long coat which at other times reposes in the capacious locker that is part of the Douglas sidecar. The scarf was also "home-made," and is equal to the usual shop variety. It is made of woollen material, worked round the edge with a blanket stitch and finished with squares at both ends in a purple wool. Gloves with fur backs are preferable to fur-lined, being as warm as most, but it stands to commonsense that if one motors in wet and cold long enough no gloves can entirely eliminate all physical discomforts. For summer wear a pair of double-lined woven gloves, which cost 1s. 11½d. at a village store, give much service. Spats are good wear for the legs, these being very easily put on.

When sufficiently clad, motor cycling is most enjoyable, but under bad weather conditions mackintosh and oilskin are the only possible wear. Meeting rain at twenty miles an hour will saturate any but the most impenetrable garments, and the lady motor cyclist will add to her comfort if she carries in the sidecar an "oily" and sou'-wester.



Miss Maud Dunham and her Douglas outfit. The upper photograph shows her clad for warm weather riding, and the lower in neat attire for winter time.

B.S.A.

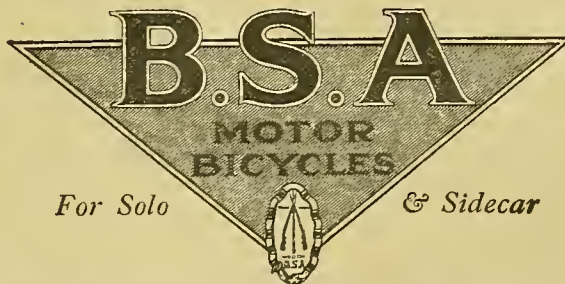
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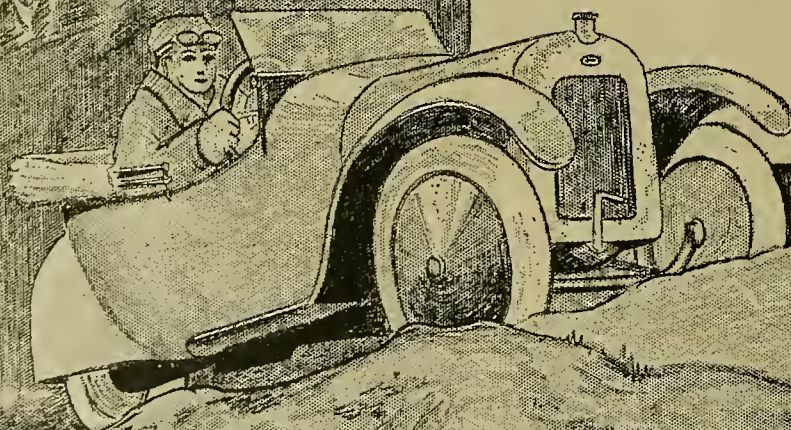
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Evolving a Motor Cycle from First Principles.

A Machine of Unorthodox Design embodying Aluminium Frames and Forks.

By MAJ. C. B. WATERLOW, R.A.S.C., M.T.

TO anyone returning from the uttermost parts of the earth, it is strange and delightful to pick up once more the threads of the old world, not the least interesting part of which is "the motor cycle world." "The blue" from which I am now returning has been of such an exceptionally cerulean hue that neither letters nor journals were able to reach me for the best part of a year. Therefore, I approach

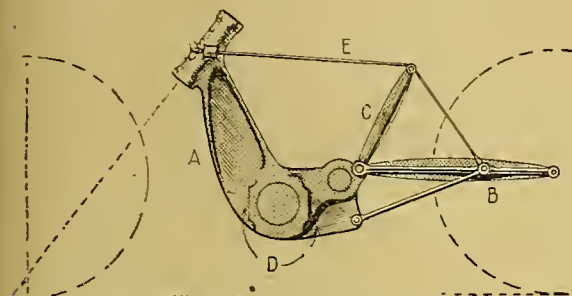


Fig. 1.—A motor cycle designed by the author from first principles. The frame also forms the crank case for a four-cylinder horizontally-opposed engine, two cylinders being mounted on either side. Rear springing may be incorporated also. For ladies' use the tie rod may be removed and the rear part triangulated.

once more the subject of the motor bicycle, its potentialities and future, almost as a visitor from another world, and in writing this article I am trying to imagine that the existence of push bicycles is unknown to me, so as to approach the question in the same way as one might, for example, tackle such a problem as "how to extract locked energy from the atoms," almost without reference to precedent or guiding formula of any kind.

The problem in this case is, "how to make a two-wheeled self-propelled vehicle that shall be as 'good' as possible in every way," and the latter part of the proposition needs so much amplification and definition that I shall content myself by endeavouring to describe my own particular ideals.

Following out this imaginary process of evolution without reference to precedent or example of any kind, I shall first of all discover that it is possible and easy to ride a two-wheeled vehicle, probably by trying it down a hill after the manner in which the Wright Bros. started their gliding experiments. Then I should have to think out the best means of connecting the two wheels together and of locating my source of power. Now the example of the brazed tubular steel frame would not be before me, and this structure, with its almost glass-like rigidity and fearfully unequal distributions of stress and strain, would not stand the slightest chance with me. At this point, many readers will call to mind the Brown Midget Bicar of the earlier days of motor cycling; but, excellent though Mr. Brown's endeavour undoubtedly was, it did not resemble very closely the frame (provisionally protected) which I illustrate in fig. 1.

A famous scientist of the automobile engineering world once remarked to me on seeing my motor

bicycle, a standard roadster of 1910, that it looked to him like an animal which kept all its vital organs outside instead of inside. My frame (fig. 1) has one principal member A, which is a kind of large breast-bone containing the crank chamber, cylinder beds, etc., as well as the steering head. To this principal member, which is preferably cast in some suitable alloy of aluminium, and which may be very light, are attached the other two main members, struts for the seat and the rear wheel respectively; a light tie bar, which also may be a continuation of the steel hawser or wires E, makes of the beam B a rigid structure with the principal member A. The duplicated adjustable steel hawser E maintains the whole in position, the seat strut C being adjustable for convenience of position about the pivot at its lower end, the adjustment being secured by lock nuts or set screws or other convenient means.

It will be seen at once that I have burdened myself with very few parts, and comparatively little work in making and assembling them, whilst I can easily so form my struts and ties as to get the most even distribution of stress, and so can reduce the weight out of all proportion to that of the brazed steel tubular frames that we know.

Having satisfied myself on the question of the main connection between the two wheels I must next think out my source of power from first principles. I have already indicated part of the conclusions to which I came by saying and showing that I propose to cast crank case and cylinder beds in one with the frame member A, so I may as well say at once that I arrive at a small four-cylinder horizontally-opposed four-stroke, air-cooled, with outside flywheels, further details of which I must for the present withhold. As regards its having four direct acting cylinders working on the Otto cycle—which, of course, I have to discover independently! — I soon find out that this is the smallest number

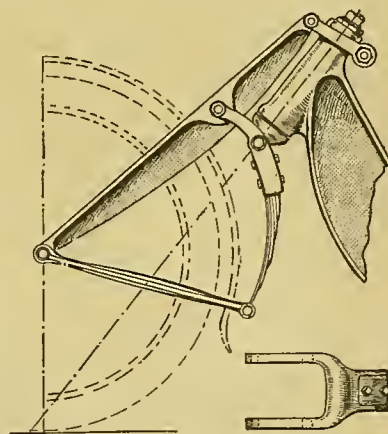


Fig. 2.—A cast aluminium alloy spring fork design by Major C. B. Waterlow.

of cylinders that will give me a semblance of continuous torque at all speeds, and, since I must have comfort as an essential part of the "goodness" of my machine, I must have at least four cylinders, which are attached to the crank case at D. I might have six or more, you say. Yes, but I cannot see my way to arrange them "conveniently" without sacrificing more "goodness" than I gain by the increased

Evolving a Motor Cycle from First Principles.—

number. Having generated my power I must find out how to transmit it. I see at once that there are many ways of doing this, that it need not even be done through one or other or both of the wheels, fan propellers being a possibility. However, I decide eventually upon the back wheel as being more consistent with that "goodness" that I have set out to seek; and I then puzzle my brains about how to get my power in suitable ratios from the engine to this wheel.

The Gear Box.

Here, in the real world, as distinct from the world of imagination in which I am at present wandering, a very interesting point crops up. The early motor bicycle manufacturers had the precedents both of chain and shaft drive on push bicycles, yet, for the most part, they chose neither, but painfully evolved belt transmission, following rather the example of power distribution in shops. Now, in these latter days, they are largely reverting to the chains that they cast off at first. This state of affairs sets one thinking: it tends to show that there is plenty of life in our engineering industries.

I decide on chain transmission *via* a countershaft gear box, and this box gives me much trouble. Of course, I knew nothing of the Frenchman who said of the early Panhard "crash" gear box, "*C'est crude et brutale, mais elle marche*": *elle marche*, "it goes," was the essential feature, the others were subordinate. However, I do not think that I, as a visitor from another world, could stand the crash: my gears would be always in mesh and would be brought in and out of action frictionally. Again, as a visitor from another planet, I should shy most emphatically at the sidcar: I could not possibly understand it, because it is a thing—a travesty of mechanics—that a close consideration of first principles could never evolve. Therefore, with my four-cylinder engine of fully six horsepower, I should only want two speeds. Therefore, my gear box would be a very dainty affair.

Having reached the rear axle, I see that I have still got to arrive at the road, and I say unhesitatingly that the tensioned wire wheel is the only thing consistent with the "goodness" of my machine.

I very soon discover from first principles and other things that I must have springing. In fig. 2, I show a form of spring fork similar in principle to one that I patented in those dim, distant pre-war days and that

others have again since patented, in so far as I can see all infringing both myself and each other. The fork that I show (also again provisionally protected) has the advantage of keeping the leaf spring—evolved from first principles—out of wet and dirt. The main fork member, which should preferably be of cast aluminium alloy, is carried in the usual manner on two pairs of links. Here, however, the similarity to general practice ceases, for the lower pair of links is extended to the rear (see small sketch), and carries a laminated spring, which follows approximately the line of the mudguard. The lower end of this spring is connected to the hub by two light struts which are normally in compression. These struts may be made to support the mudguard, but, if so, the latter must not be rigidly attached to the main fork member.

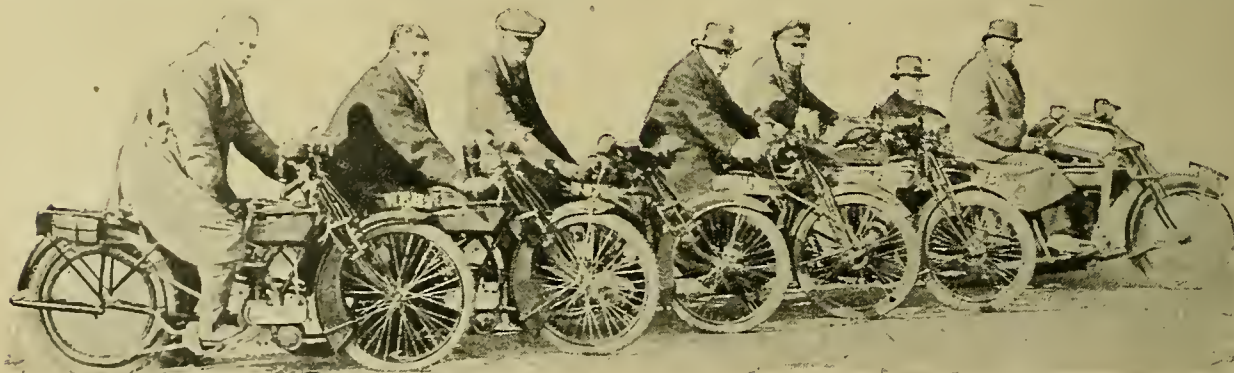
Now in order to correct the appearance referred to above as "carrying the vital organs outside"—look at any modern American machine with all its equipment on, and you will see the force of the illustration—I resuscitate a feature which seems to have disappeared, namely, windscoops for the engine. There are also other cooling arrangements provided, details of which I must withhold for the present.

The first principles of my own anatomy demand an extremely comfortable seat, footboards, and handlebars, and over the evolution of these I have little difficulty, most human achievements being made under the stimulus of pain!

Moonshine?

If this article succeeds in making its readers think thoughts that are in any way new, it achieves its purpose. I am, of course, well aware that there is "nothing new under the sun," but under the moon there may be: and I am being invalided home from Mesopotamia as a "mental case." Therefore, in the pale moonlight of thought in which I am officially supposed to be wandering, I may have touched a little of that magic of true novelty that does not appear in the daylight.

Coming out into the sunlight once more—not the sunlight of Mesopotamia: Oh, never that again, I beg!—I should like to conclude these remarks by reminding my readers that motor cycle manufacture is the only branch of the motor industry in which we British really lead the world. Let us all do everything we can, by our inventive endeavours and otherwise, to "keep these home fires burning."



A meet of enthusiastic Millhouse (Sheffield) motor cyclists, who met last Saturday for the "first run" of a club that is about to be formed in the district. Reading from left the first four machines are new model Diamond, Douglas, Rudge, and Enfield.

**N.M.C.F.U. (Leeds).**

This branch of the N.M.C.F.U. held a very successful whist drive and dance last week, over 250 persons being present. Hon. secretary, Mr. T. W. Lancaster, 7, Evelyn Street, Chapeltown Road, Leeds.

A New Sheffield Club.

An effort is being made to form a new club in the Millhouses district of Sheffield. Motor cyclists in this district who are interested should communicate with the hon. sec. *pro tem.*, c/o Mr. E. W. Hatfield, Millhouses Garage, Sheffield.

Widnes M.C.C.

A meeting of Widnes motor cyclists was held recently, with the result that a new club has been formed which will be known as the Widnes M.C.C. An opening run has been arranged for the 21st inst. to Llangollen. Hon. secretary, Mr. A. J. Bailey, 57, Regent Road, Widnes.

Streatham and District M.C.C.

In connection with the above club, a meeting of members will be held at the Crown and Sceptre, Streatham Hill, at 8 p.m., on the 15th inst. All old members (and prospective new members) will be welcome, and it is hoped to re-organise the club and arrange a series of runs and competitions during the year.

Troedyrhiw and District M.C.

This club will hold its opening run on the 20th inst., when the members will meet at 9 a.m. at the Masons' Arms Hotel for a run to Porthcawl. Any local motor cyclist desirous of joining the club should attend the headquarters any Wednesday evening at 7.30 p.m.

Manchester M.C.

Many new members are being enrolled, chiefly, we understand, from the ranks of new motorists. The hon. secretary announces the first competition, in the form of a twenty-five miles speed judging trial, starting from the Swan Hotel, Bucklow Hill, Cheshire, on April 13th, at 2.30 sharp. This competition is open to all (members or otherwise). No watches or speedometers will be allowed, and four prizes are offered.

Newcastle and District M.C.C.

The Newcastle and District Motor Club is nearing the end of its period of suspended animation. A beginning will be made on the 17th inst., when a run to Allendale is in contemplation. Members, friends, and prospective members will meet at the Herd's House, North Terrace, Newcastle, at 10.30.

The secretary, Mr. Wm. Robson Lister, 2, St. Nicholas' Buildings, Newcastle, will be glad to receive intimation from any motorist who may desire to take part, and will, if necessary, arrange for lunch at the King's Head, Allendale.

Future Events.

- April 11.—*Carlyle C. and M.C.C. (Chel-sea). Dance at Chelsea Town Hall.*
 April 12.—*Public Schools M.C.C. Opening Run to Shere.*
 April 13.—*Eastern Counties M.C. Run to Quendon.*
 April 13.—*Essex M.C. Opening Run.*
 April 13.—*Liverpool M.C. Opening Run.*
 April 13.—*Manchester M.C. Speed Judging Competition.*
 April 13.—*N.M.C.F.U., Sheffield. Run to Monsal Dale.*
 April 15.—*Streatham and District M.C.C. General Meeting, Crown and Sceptre, Streatham Hill, at 8 p.m.*
 April 17.—*Newcastle-on-Tyne M.C. Opening Run to Allendale.*
 April 18.—*York and District M.C. Run to Richmond.*
 April 19.—*N.M.C.F.U. National Meet at Stratford-on-Avon.*
 April 19.—*N.M.C.F.U., Sheffield. Run to Stratford-on-Avon for National Meet of N.M.C.F.U.*
 April 20.—*N.M.C.F.U., Newcastle-on-Tyne. Run to Alston.*
 April 20.—*Troedyrhiw and District M.C. Opening Run to Porthcawl.*
 April 21.—*Birmingham M.C.C. Open Reliability Trial for Victory Cup.*
 April 21.—*Dublin M.C.C. Dunlop Cup Trial.*
 April 21.—*Widnes M.C.C. Opening Run to Llangollen.*
 April 21.—*York and District M.C. Run to Fountains Abbey.*
 April 26.—*Public Schools M.C.C. Hill climb.*
 April 28.—*Edinburgh and District M.C. Open Reliability Trial.*
 May 4.—*Bolton and District M.C. Reliability Trial.*
 May 4.—*N.M.C.F.U., Sheffield. Reliability Run to Knutsford.*
 May 10.—*The M.C.C. Speed-judging Competition.*
 May 21.—*York and District M.C. Reliability Trial.*
 May 24.—*Birmingham M.C.C. Social Touring Trial. Week-end to Llangollen.*
 June 6.—*M.C.C. London - Edinburgh Run.*
 August.—*A.C.U. Six Days Reliability Trials.*

Edinburgh and District M.C.

The 1919 programme has not yet been definitely fixed, but the energetic band of enthusiasts, who were responsible for the popular Scottish Six Days, have already decided upon an open reliability trial, to be held on the 28th inst. Entry forms are now available from the secretary of the Trials Committee, Mr. J. W. Anderson, 6, Castle Terrace, Edinburgh. The question of a Scottish Six Days is under consideration.

N.M.C.F.U. (Sheffield).

On the 13th inst. members will meet at the New Town Hall at 11 a.m. for a run to Monsal Dale. On Easter Saturday those members who intend to participate in the run to the National Rally at Stratford-on-Avon will meet at 2 p.m.

N.M.C.F.U. (Newcastle-on-Tyne).

Mr. W. R. Squibb, hon. secretary of the Newcastle branch of the N.M.C.F.U., 63, Hampstead Road, Benwell Grove, Newcastle, advises a club run to Alston on the 20th inst. Meet at Haymarket at 10.30 a.m.

Hamilton and District M.C.C.

Mr. J. F. Burness, Reith Cottage, Hamilton Road, Motherwell, N.B., advises us that he is the hon. sec. and treasurer of the above club, and that an official announcement will be made shortly concerning the resumption of its activities.

N.M.C.F.U. (Portsmouth).

The N.M.C.F.U., Portsmouth and District Branch, will make their opening run to the White Horse, Easebourne, Midhurst, on the 18th inst., starting at 10.30 a.m. from headquarters, the Blue Anchor Hotel, Kingston Cross.

Bristol M.C.C.

The trustees and hon. treasurer of the above wish to notify all members that they are arranging for a meeting to be held on Monday, the 14th inst., at 7 p.m., at the Grand Hotel, Broad Street, Bristol, for the purpose of receiving a report from the hon. treasurer as to what has been done with the club's finances, and also to propose that the club resumes active operations. It is hoped that all members will make a special effort to be present.

Essex M.C.

The opening run will take place on the 13th inst. to the Green Man Hotel, Harlow, leaving headquarters, the Eagle, Snarebrook, at 11 a.m. sharp.

It is some considerable time since members had an opportunity of meeting on the road, and it is hoped that they will make a special endeavour to be present. It is proposed to arrange an impromptu competition during the afternoon.

Those desirous of participating in the Easter tour should advise the hon. sec. at once. The itinerary includes the Wye Valley, and embraces some of the finest scenery in the West of England. Easy stages have been arranged to give members an opportunity of seeing the many places of interest *en route*.

Members who intend to join the party, or who require further details, are asked to communicate with the hon. sec. (Holme Villa, Algers Road, Loughton) in order that hotel accommodation, etc., may be arranged.

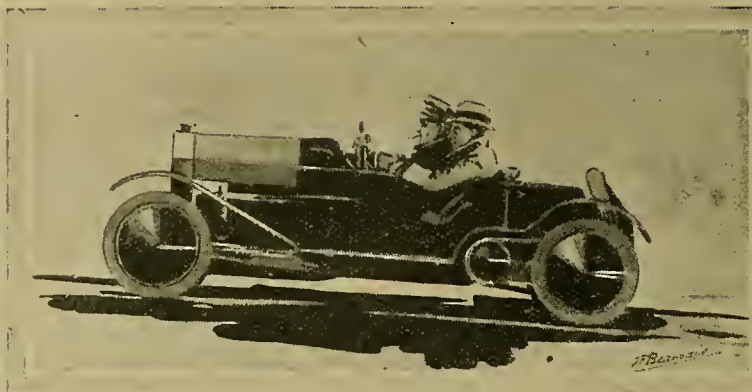
C.F.B. CYCLE CAR.

Advance Particulars of a Miniature Four-wheeler which may be Marketed Shortly.

THE C.F.B. cycle car is not yet on the market, but is an ingenious design got out by a correspondent, Mr. F. C. Beauvais, who has been, for several years, experimenting with various cycle cars. This contributor advises us that he is making preparations to make the first machine to demonstrate its features. The drawings show an 8 h.p.

air-cooled V twin engine placed behind a dummy radiator, immediately behind which the body is brought forward into a V shape, so that the air passing through the bonnet is directed on to the cylinders and swept away behind them.

It is the designer's idea to reduce price as far as possible, and he hopes to be able to produce the vehicle at £100. The chassis is of ash suitably strengthened, and wherever possible steel pressings are



The friction-driven C.F.B. cycle car

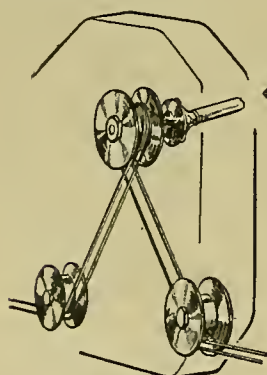
employed. The engine drives a propeller-shaft, at the end of which a large cone is mounted. This engages with a friction wheel capable of being slid along the face of the cone. On the end of the shaft there is a crown wheel meshing with one of two bevel gears mounted on the countershaft. From countershaft to rear wheels the drive is by short belts

running over large diameter pulleys to the back wheels. Sliding the friction wheel up and down the cone naturally varies the speed, while changing over from one bevel to the other produces the reverse. This gear gives five speeds forward and five reverse.

The frame is mounted on cantilever springs fore and aft, and should consequently be very comfortable. The steering is by wheel, wires, and bobbins, the latter being of large diameter and carried underneath the bonnet.

Hammock pattern seats have been adopted, and, by undoing a clip, the steering wheel may be moved from the extreme off side to the centre, so as to be in a convenient position should the driver elect to drive solo. This displacement of the steering wheel is rendered possible by the fact that it is provided with a universal joint just behind the topmost pulley. It may also be noted that one seat may be folded away and the other slid sideways so as to occupy a central position in the body.

The following dimensions may be of interest: overall length 10ft., overall width 4ft., overall height 3ft. 4½in., track 3ft. 3in., wheelbase 7ft. 6in.

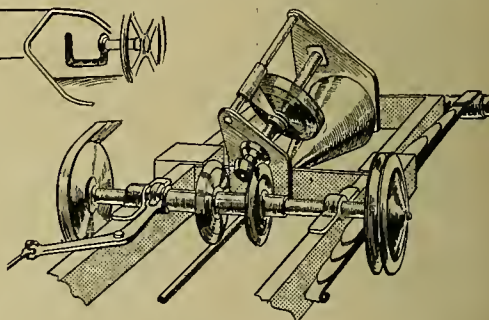
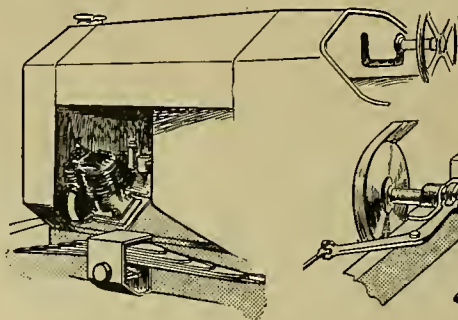
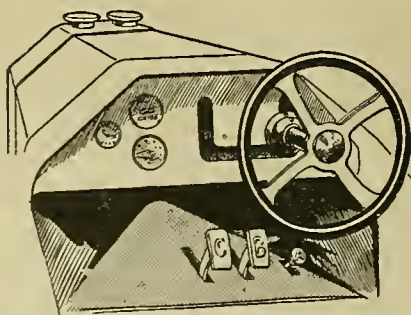


(Left) The steering is by bobbin and cables. The end of the steering-pillar has a universal joint, permitting the former to be used in or out of centre as desired.



(Centre) Showing the air-cooled V twin engine in position. The front of the body is wedge shape to deflect air currents past the cylinders.

(Right) Diagrammatic sketch of the friction drive, showing the bevel gears.



PETROL IN PLENTY—AT A PRICE!

The Petroleum Executive find it necessary to correct the impression which appears to prevail in some quarters that there is a serious scarcity of petrol. It is asserted that there are abundant supplies in this country available for all purposes.

The control system is being continued not in order to restrict supplies, but for the purpose of collecting the war tax of 6d. per gallon, the present arrangements for which must remain in force until the question can be dealt with in the new Budget.

CURRENT CHAT

Times to Light Lamps.

SUMMER TIME.

April 10th	...	...	8.14 p.m.
" 12th	...	...	8.18 "
" 14th	...	...	8.21 "
" 16th	...	...	8.25 "

Scottish Six Days' Trials.

The question of holding a six days' trial is at present under consideration by the Edinburgh and District M.C., the organisers of this popular event before the war, but, we understand, it is doubtful if such a trial will be attempted this year.

Special Features.

EVOLVING A MOTOR CYCLE FROM
FIRST PRINCIPLES.

CYLINDER DESIGN.

IN THE FUEL WORLD.

Motor Cycles by Passenger Train.

Through the action of the Coventry Chamber of Commerce, the restrictions on motor cycles over 1 cwt being carried on passenger trains have now been removed. The need for the abolition of this restriction has been referred to in *The Motor Cycle* several times.

Police Traps.

Police traps are in operation between Lewisham Obelisk and Bromley Market. The first is between St. Mary's Church and Catford Terminus. The second is on the London Road, just leading into Bromley Market, a third trap is on the Eltham Road, between Moltingham Lane and Lee Green Terminus, and a fourth on various parts of the Shooter's Hill Road.

A Former Zenith Rider.

A. B. Wade, formerly well-known as a rider of Zenith machines, informs us that he has had to resign his commission owing to ill health. He will be glad to hear from any survivors of No. 1 Battery, M.M.G.C., who would care to communicate with him with a view to a future re-union. Letters should be addressed to A. B. Wade, 3, Tydraw Place, Cardiff.

The Sarolea Motor Bicycle.

The Sarolea engine has been known in this country for quite a long time as being a very satisfactory Belgian production. The firm of Sarolea, at Herstal, near Liège, has been working hard since the Armistice to reorganise its factory, which was considerably damaged during the German occupation, and the firm is hoping very soon to begin to manufacture engines and motor bicycles once more. Towards the end of May it is hoped to produce a 4 h.p. single-cylinder motor bicycle, 85 x 97 mm., fitted with Sturmey-Archer countershaft gear, transmission by chain and belt, and all the latest improvements.

This information has been sent to us by M. Fagard, one of the Belgian representatives of the International Federation of Motor Cyclists. He states that the speed with which Belgian motor cycle firms can resume their pre-war activity depends to a large extent on the assistance the Allied Governments can give them in furnishing them with the necessary raw materials.

Children on the Highway.

The *Autocar* last week touched on a topic that concerns motor cyclists as much as car owners. The article in question was entitled "The Freedom of the Road and its Concomitant Obligations," and referred to the obligations of pedestrians on highways. In many districts during the war fast motor vehicles practically disappeared from the road, and the very young children now do not realise the difference in speed between a war lorry and a fast motor cycle. In consequence, we must safeguard both the child and ourselves by taking extra precaution, especially on passing schools and cinema shows. Time will however educate the younger generation to look after himself on the highway, but for the present extra caution will be necessary.

Singles on the Road.

A middle-aged family man who was beginning to take an interest in motor cycles said last week, "I suppose makers have stopped making V twins now? This remark was based on deduction, for the number of single cylinders seen on the roads compared with twins is particularly noticeable, though not at all extraordinary.

Runabout with Radial Engine.

The light four-wheeler with three-cylinder radial engine, to which we referred in a recent issue, will be made by the Cosmos Engineering Co., of Bristol. The wheelbase will be 7ft. 6in. and the track 3ft. 10in., the wheels being detachable and shod with 700 x 80 tyres. The transmission will be by shaft, and, complete with hood, screen, etc., the price, it is said, will be under £200.



All cars and sidecars entering Dublin have been stopped and searched by the police, with the object of ascertaining whether arms were being carried.



The M.C.C. opening run to Hatfield last week end. Many new machines were in evidence, together with a large number of well-known motor cyclists.

A Spring Frame Chater-Lea.

As mentioned in *The Motor Cycle* some time ago, the Chater-Lea Co. are introducing a spring frame model. This machine was present at the M.C.C. opening run last Saturday, and is a very striking looking outfit.

Prohibition of Imports.

We are informed by a reliable authority that the prohibition of imports is likely to be relaxed in the near future. It is probable that the various firms will be permitted to import 50% of the quantity brought into the country in pre-war days.

Coventry and Warwickshire Motor Club Opening Run.

Beautiful weather for the opening run brought a large gathering of members to the meet at Keresley House, the residence of the president, Mr. Edward Manville, M.P., on Saturday last. After a very cheerful reunion and excellent hospitality from Mr. and Mrs. Manville, a start was made with the first competition since 1914, this taking the form of a combined paperchase and speed-judging competition, for which eighteen competitors turned out. Mr. Sam Wright laid a sporting trail over twenty-two miles, ending up on the outskirts of Coleshill, where thirty-eight members afterwards met for tea, when the prizes were presented.

In the solo class the winner was Mr. A. L. Auerhaan (4 h.p. Triumph), second and third places being taken by Mr. W. Johnson (3 h.p. Enfield) and Mr. S. P. McGowran (4 h.p. Triumph). The winner's margin of error was 4½ m. slow.

In the passenger class the winner proved to be Mr. G. H. Vernon (8 h.p. Rudge), whose time was 1 m. fast. Mr. H. Nelson (5-6 h.p. Rudge) was second, 7 m. slow; and Messrs. F. Hulbert (4 h.p. Triumph), 7½ m. slow, and J. Bachelor (4 h.p. Triumph), 7½ m. fast, tied for third place.

The next competition will be held in May, the event being a long distance reliability trial for a fifty guinea challenge cup.

Birmingham M.C.C. Opening Run.

Upwards of a hundred members and friends turned out for the Birmingham M.C.C. opening run last Saturday to Stratford-on-Avon, in connection with which a speed-judging competition was held. The preliminary results include the following three names: E. Kibble and H. Kershaw (tied); —. Kuhn first among the non-members.

The New Indian.

One of the several new machines at Hatfield, last Saturday, was a new Power Plus Indian—ridden by Mr. E. Bridgman. It is the first of this model to be seen in this country. The chief novel features consisted of a Splittorf dynamo carried just level with the bottom of the front mudguard, and adequately protected by a wide shield. It was driven off the engine shaft by an enclosed chain.

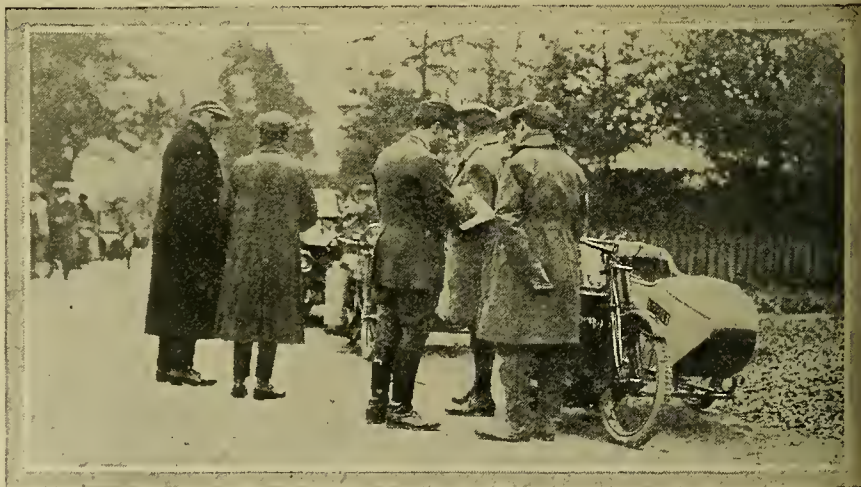
Instead of the usual rods, the carburetter and ignition controls were by Bowden wires and twist grips.

The Motor Cycling Club's Opening Run.

This year the Motor Cycling Club decided to hold its opening run to the Red Lion Hotel, Hatfield, instead of its usual rendezvous, Brighton, owing to the fact that sufficient hotel accommodation could not be procured. This took place last week-end.

Essex Club Dinner.

Many of the leading lights of the Essex Motor Club were present at the reunion dinner held at Frascati's on Saturday last. During the course of a speech, Mr. S. G. Cummings, the president, remarked that it was the intention of the club to embark on a big programme of competitions and events for this year, and progress had already been made in organising the Westcliff speed trials. The enthusiasm displayed proved patently that the foundation of the club had in no way suffered during the last four years of enforced inactivity, and the future of the club seems assured.



Starting off competitors at the meet of the Coventry and Warwickshire M.C.C. last Saturday

The New Claudel-Hobson Carburetter.

Single Lever Control, Adjustment Device for Varying Climates and Easy Starting, Slow-running By-pass, and Top Petrol Feed to Float Chamber.

THE announcement that the makers of the well-known Claudel-Hobson automobile and aero engine carburettors are shortly producing a new type of single-lever carburetter for motor cycle engines will be of considerable interest, particularly since the new device is altogether different in general design from the model produced before the war.

After a protracted series of tests, the new Claudel-Hobson carburetter, which is known as the H.C.4, will be ready for the market at no very distant date. Since it is of the horizontal type and very compact, it should be much more easily adaptable to motor cycle engines than

the exterior into the side of the chamber surrounding the jet.

When the engine is running with the throttle open, a certain amount of air is drawn through the two ports upwards past the jet into the throttle in addition to the main column of air passing through the carburetter to the engine, the combined action of which causes petrol to issue from the jet and become finely atomised, since the two air streams meet together inside the throttle above the jet. The correct proportions of air and petrol at all openings of the throttle are automatically obtained by the varying amount of air passing the jet *via* the annular chamber from the two subsidiary air ports, a point which constitutes the chief feature of this carburetter, particularly since the automatic proportioning of the mixture is gained without the use of a single moving part except that of the throttle. The throttle is also specially shaped, in order that the main air stream passing across the top of the jet shall have the maximum of efficiency in the atomising process when the air speed is comparatively slow at small throttle openings.

In order to allow for changes in climate or temperature, a remarkably neat and simple device is fitted on the carburetter, as shown in fig. 2. Projecting into a slot cut in the main air intake side of the throttle is a small streamline vane, which is connected to a small thumb lever on the outside of the carburetter barrel. By moving the lever the vane can be rotated in the slot of the throttle, thus varying the amount of air drawn through the carburetter to the engine, whilst, at the same time, the throttle can be rotated independently in its housing. By this means it is possible at any throttle open-

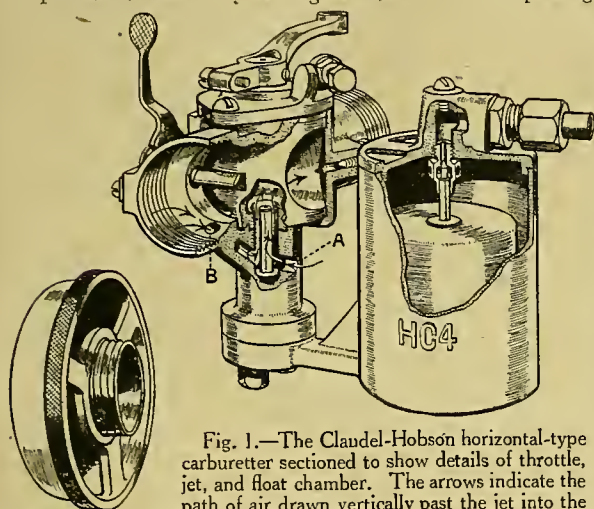


Fig. 1.—The Claudel-Hobson horizontal-type carburetter sectioned to show details of throttle, jet, and float chamber. The arrows indicate the path of air drawn vertically past the jet into the interior of the throttle from the auxiliary air ports A and B. The top feed of petrol to the float chamber will be noted.

the earlier Claudel-Hobson model, as it can be attached directly to the induction pipe in the usual manner without special alterations.

Although entirely automatic in action with the single lever control, the carburetter is extremely simple in design and operation, whilst the easy method of adjustment for climatic or temperature conditions and the slow-running device are two features which will make a special appeal to the motor cyclist.

Auxiliary Air Ports.

The main portion of the carburetter consists of a horizontal barrel casting, in the centre of which is a vertical rotating throttle fitted with a single control lever. Across the centre of the throttle a tunnel is bored equal in internal diameter to that of the carburetter barrel, and by rotating the throttle between given limits the column of air drawn through the carburetter to the engine can be varied. Immediately below the carburetter barrel, and protruding into the centre of the throttle is the jet, which is housed in a small annular chamber, as will be seen in fig. 1. Communicating with the annular chamber are two ports, A and B; one extending from the interior of the main air intake of the carburetter to the jet, whilst the other is drilled directly from

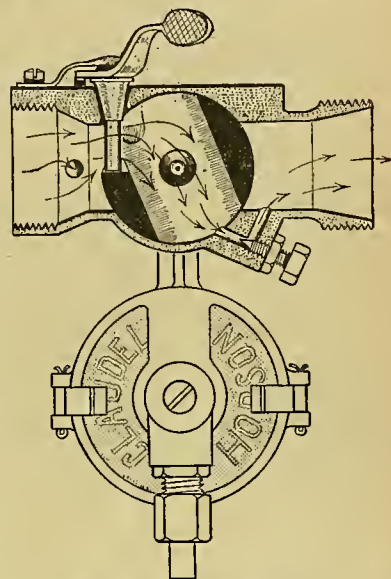


Fig. 3.—Plan of the Claudel-Hobson carburetter in section, showing the path of air passing the adjustment vane for temperature across the jet in centre of throttle and through the adjustable by-pass to the engine. When the throttle is rotated to the left the main stream of air is drawn straight through the throttle across the jet horizontally.

ing to vary the mixture without altering the permanent setting of the carburetter, in addition to which both the throttle and the vane can be shut right off, thus affording an easy means of creating an abnormal suction on the jet for starting up purposes, since the whole of the air has to pass the jet *via* the two subsidiary air ports. The thumb lever and vane are kept in position by a small spring, and are easily withdrawable at any time.

By-pass for Slow Running.

This device will undoubtedly prove extremely useful, for although the permanent setting of the carburetter is not altered in any way, it is at the same time possible to get the best results in fuel consumption and engine efficiency under all running conditions generally met with, by the simple movement of a lever.

The by-pass for slow running on this carburetter is shown in fig. 3, and it consists of a pointed screw projecting into a drilled passage, extending from the side of the throttle chamber to the induction pipe end of the carburetter barrel. The screw has a hexagon head and a lock-nut for adjustment purposes. Under ordinary circumstances the throttle is closed for slow running purposes, but the small amount of mixture required to keep the engine ticking over is drawn through the passage and past the by-pass screw at the side of the carburetter, and by adjusting the screw the engine can be set to turn over at the smallest number of revolutions possible.

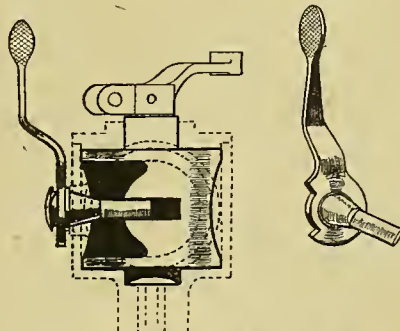
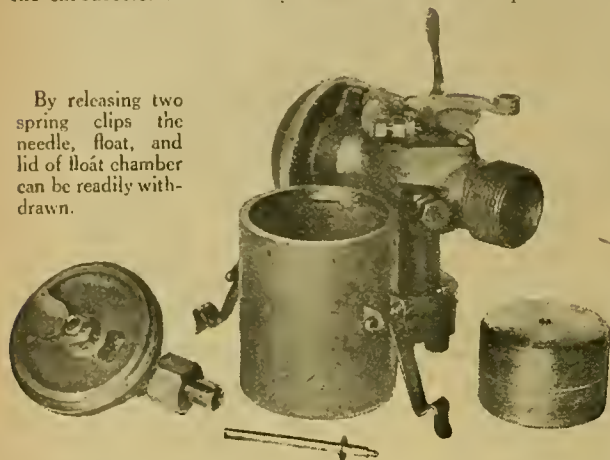


Fig. 2.—The diagram on the left shows how the temperature adjustment vane engages with a slot in the rotating throttle. (Right) The vane with operating thumb lever detached from the carburetter.

The New Claudel-Hobson Carburetter.—

To prevent "blow-back" of mixture from the throttle and, therefore, waste of fuel, a bell-shaped cap is screwed on the outer end of the carburetter barrel. Any tendency for the mixture to escape at low engine speeds when the suction is intermittent is frustrated by the cap, but at the same time the entry of air into the carburetter is in no way restricted.

By releasing two spring clips the needle, float, and lid of float chamber can be readily withdrawn.

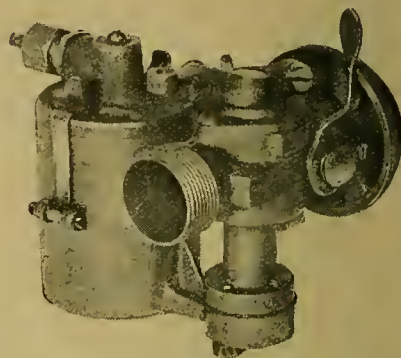


The chief feature of interest in the float chamber fitted to the new carburetter is the top feed arrangement of petrol. The float needle has no toggle and weight mechanism, and it simply engages directly with a seating screwed in the lid of the float chamber. An adjustable collar is fitted on the needle, so that the level of petrol can be regulated, whilst the needle is kept central by small guides in the base of the float chamber and in the needle valve seating respectively. By withdrawing a small screw above the needle valve seating in the float chamber, air locks in the petrol feed pipe can be eliminated should occasion demand it.

Accessibility.

As it is only necessary to unscrew a petrol pipe union and disengage two steel clips to withdraw the lid of the float chamber, it is an easy matter to get at the needle and float at any time.

Practically the whole of the carburetter is made of gunmetal, and the construction is particularly sturdy throughout. The makers, Messrs. H. M. Hobson, Ltd., 29, Vauxhall Bridge Road, London, S.W.1, will shortly announce the date when this new model will be ready for the market, but in the meantime it may be stated that either a union or a plain flange joint will form the means of attachment of the carburetter to the engine or induction pipe.



The Claudel-Hobson horizontal-type carburetter.

THE 8 h.p. BLACKBURNE TWIN.

New Entrant in the Big Twin Sidecar Class of British Motor Cycles.

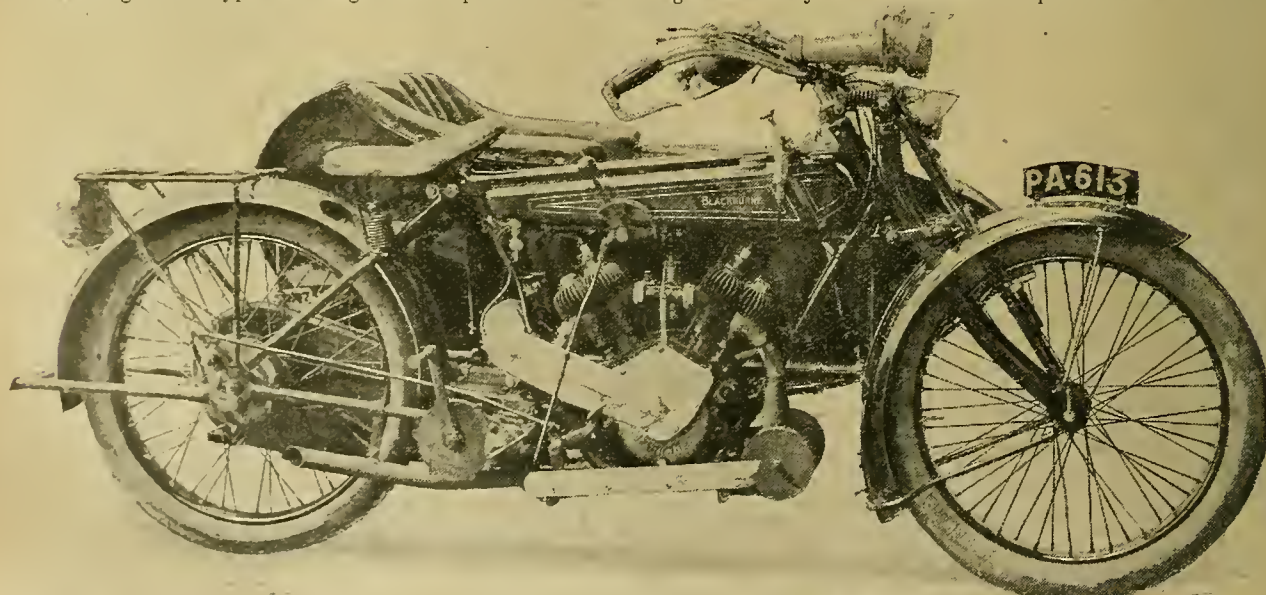
WE were afforded an opportunity to see and test the new 8 h.p. twin Blackburne last week, and as space in this issue is not available to do justice to the performance of the machine, we postpone details of the trial until the next issue. The photograph given here will show the reader how this new entrant into the big twin sidecar class appears now it is complete.

As will be seen, the outfit presents a very handsome appearance. The frame is of the straight tube type with diagonal

top tube, and the mudguarding is well carried out. The chief feature of the engine, however, i.e., the outside flywheel, is not seen, as it is on the side next to the sidecar, but many of the details of the engine are shown and will not fail to interest.

The bicycle part of the machine is similar in many details to the 4 h.p. model recently described in *The Motor Cycle*. The whole machine is symmetrical in design, even the frame tubes being sloped to the same angle as the cylin-

ders. The magneto chain case is split horizontally, the two halves being secured by two screws, the removal of which allows instantaneous access to the chain. It will be noted that the design of the front cylinder exhaust pipe is somewhat peculiar, the pipe being tapered to a funnel shape from the cylinder union, the final exit to the expansion chamber being 1½ in. diameter. This, it is claimed, assists in the expulsion of the exhaust. Coil springs are used for the sidecar suspension.



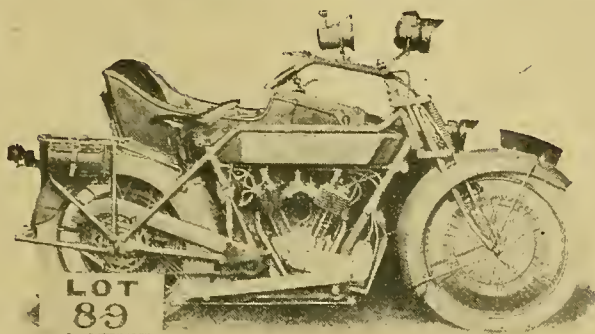
The new 8 h.p. Blackburne, the only "big twin" fitted with an outside flywheel. The engine has 85 × 88 mm. cylinders with detachable heads.

SALE OF U.S.A. ARMY MOTOR CYCLES.

Sidecar Outfits bought by Dealers at Figures Higher than the Catalogue Price.

A SALE of motor cycles used by the United States Army in this country was held by the Grahame-White Co., Ltd. (Auction Department), at the London Aerodrome, Hendon, London, N.W., last week, on instructions received from the U.S. Liquidation Commission. Altogether there were twenty-three motor cycles, and the prices fetched were remarkably good. The organisation of the sale was particularly well carried out, and the Grahame-White Co. deserve congratulation.

The sale opened with the disposal of a number of lorries and a few touring cars, and the first motor cycle to be put up was Lot 74. So far as motor cycles were concerned, the catalogue needed considerable alteration, because it was first announced that there would be nine Harley-Davidsons for sale, but 4 h.p. Douglases and sidecars took their place, and there were no motor cycles of American manufacture for disposal. The Douglases were in fairly good condition and vastly superior to the motor cycles sold by the Government Disposal Board at the recent sales we have attended. Nearly all were fitted with lamps, there were few parts missing, and, though there were signs that the machines had been used from a year to eighteen months, as the catalogue stated, they were in fair order.



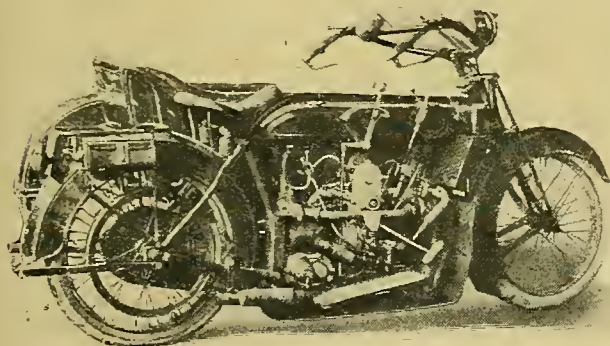
One of the nine new Enfield outfits that were disposed of at good prices. It made £145.

Bidding for the first Douglas started at £50, and it was eventually knocked down at £70. Probably because the buyer did not turn up promptly it was put up for auction again, and the next time fetched £65. Of the fourteen Douglases sold, six fetched £65 each, six were sold for £70 each, one was sold for £75, while the last on the list fetched £77 10s.

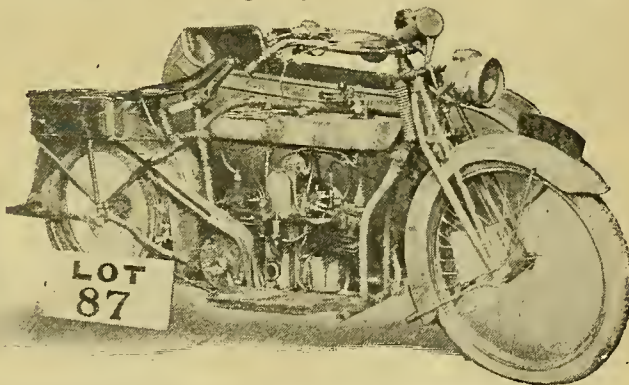
In the afternoon a number of 6 h.p. Royal Enfields, brand new and as taken out of their crates, were put up for auction. They were well fitted up, with luggage carriers attached to the sidecar bodies, and many had D.A. cylinders fitted. The bidding started at £100, and the first machine was knocked down for £145, the purchaser being heartily cheered. Six more outfits fetched the same figure, and three were sold for £147 10s. each.

Good Prices for Flat Twins.

A 6 h.p. water-cooled Humber and sidecar was sold for £95, while a 4 h.p. Douglas and sidecar which had been in use for about a year and was fitted with new tyres fetched £85. Another 4 h.p. Douglas and sidecar was sold for £80, while the last motor cycle on the list, a second-hand 6 h.p. Enfield and sidecar in fair condition, was sold for £110. Many of the new Enfields were bought by the trade.



A water-cooled 6 h.p. Humber outfit which made £95.



A 4 h.p. Douglas sidecar sold for £77 10s.

SELLING THE SIDECAR.

SOME rather amusing hints to agents on selling a sidecar were given in an American paper recently. "When you begin to talk motor cycle to Mr. Man-with-the-money, it's about time to say something about sidecars to the Lady-who-married-Him," is a useful hint in a country where motor cycles are used chiefly as solo mounts. The writer of the hints suggests that it is not wise to leave the sidecar proposition to be explained by the "hubby." "If the

job of making a sidecar enthusiast out of the missus is left to him, he may not deliver the goods. Mr. Man-with-the-money may try to explain matters, but maybe he's not a good explainer—even if he is married. Suppose he is not married? The only thing to do in that case is to watch where he goes on Wednesday and Sunday nights with his hair all slicked up and cologne on his coat lapel—then slip your sidecar letter under the girl's front door."



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor "The Motor Cycle" Herford Street, Coventry and must be accompanied by the writer's name and address.

A TABLOID HISTORY OF AIR-COOLING.

Sir,—I am glad to learn from "Revs" (page 335, April 3rd) that the Canton-Unné is a rotary engine. I have only encountered static radials of this make.

The loss of b.h.p. in a rotary ascribable to radial wind resistance is about 10%.

ROAD RIDER.

THE SUPER-SCOOTER.

Sir,—A misunderstanding exists among our friends regarding the relationship of Messrs. Trist and Co. and Messrs. Tankettes, producers of the super-scooter. Messrs. Trist, in order to help ex-Service men, the inventors of Tankettes, are affording all possible facilities in their works and London offices for the early production of these machines, and although a friendly *liaison* exists between Messrs. Trist and Tankettes there is no financial or any other agreement.

TANKETTES.

CHAIN TRANSMISSION.

Sir,—Your correspondent enquires as to the effect on chain transmission of unequal rise on the rear wheels, with its consequent twisting effect.

This state of affairs exists on all chain-driven cars, and no injurious effects are noticed. The chain is a wonderfully flexible medium, so much so, in fact, that on one car advantage was taken of this, and a castellated or other sliding coupling on the clutch was dispensed with. When the clutch was out, therefore, the chains—about 3ft. centres—ran one-eighth of an inch or so out of line, but with no harmful results.

H. RAYMOND.

MOTOR SCOOTERS IN ENGLAND.

Sir,—I notice that on page 197 of *The Motor Cycle* of February 27th mention is made of the number of motor scooters at present in London. I saw a girl riding one between East Molesey and Esher one afternoon last October. I was driving a Crossley-Bat tender when the girl in question came out of a side road on to the main road, about twenty yards in front of the car. Apparently, she took the corner too fast, because she ran on to the footpath on the near side of the road and turned a somersault into the hedge. Luckily, the rider was not hurt, but I remember it rather put the wind up me.

Blandford.

SINBAD.

SINGLE-SPEED SPORTING MODELS.

Sir,—I am sure that the manufacturers do not pay sufficient attention to the $3\frac{1}{2}$ h.p. four-stroke single and fixed engine. That is simplicity, and simplicity is the keynote of reliability. Everybody does not want a gear box, clutch, kick-starter, etc., to clean and to keep in order. A machine without this, with a well-tuned engine, makes a good light touring machine, and one that ought to cost much less than the other model—in other words, a fool-proof machine, and the machine for the million.

I am glad to see that a few readers have a good word for the simple single. If a maker was to put a model on the market at a reasonable price, consistent with good workmanship, he would deserve to do well.

W. J. STEVENS.

GEAR BOX LUBRICATION

Sir,—We read with considerable interest a paragraph in your paper dealing with a paper recently given by Capt. G. W. A. Brown, before the Institution of Automobile Engineers.

So far as gear box lubrication is concerned, we venture to think that this problem has been satisfactorily solved by our Ambroleum. We are glad to say that, our plant now

being free from war work, we have been able to resume on a large scale the manufacture of Ambroleum, and we expect in a week or two to execute all demands.

STERN'S LTD.

AVERAGE SPEEDS.

Sir,—I have heard such a lot of rot about average speeds. A friend of mine once told me that he had done a hundred and twenty miles in three hours on the road! He got quite angry when I suggested that his watch wanted regulating. I find that twenty miles per hour is a very fair average for a journey of over a hundred miles. I have as yet never exceeded that average. One can, of course, for short distances make pretty good averages. I have done ten miles in fifteen minutes, but then, the road was in perfect condition, and was also nearly straight the whole way. I am afraid I think a motor cyclist a liar if he says he has kept up an average of over thirty miles per hour for a hundred miles or more. I have no doubt it has been done, but then, the case in question is so isolated that it is probably "the exception that proves the rule."

Slough.

R.N.

REVS. AND THE SINGLE.

Sir,—Your article of March 20th raises the question in my mind of the physical causes tending to limit the revolutions of any particular engine. The time for closing of spring valves seems to be one of the more important causes. I took the first machine handy and weighed the parts. Weight of valve complete, 1,800 grains, plus one-third weight of spring 600 grains gives 2,000 grains, or $\frac{2}{3}$ lb. for the moving parts. The spring is 2.75in. long unloaded, and works between 1.6in. and 1.85in. for the $\frac{1}{4}$ ft. lift with a mean strength of 17 lb. The time of snapping over is obtained from the usual formula:

$$t \text{ seconds} = \sqrt{\frac{w \times \frac{1}{2}}{10.1 \times 17}}$$

if gravity is taken as 32.2. The time is therefore barely under 0.005 second or exactly 0.00466 second.

With a 26in. wheel and a gear of 5 to 1 the engine revolves 3,880 times in a mile. At a speed of 40 m.p.h. this is 2,588 r.p.m.

The engine therefore turns 360° in 0.0232 second, or makes one stroke of its Otto cycle in 0.0116 second. As the valve takes 0.00466 second to close the engine revolves 180×46.6

116 degrees, or practically 72° in this time.

Here at once is an obvious physical limit to the speed of the engine, as loss of suction must result from the late closing of the exhaust valve, and loss of compression from the lateness of the inlet valve, whilst the frictional losses remain unchanged.

The angular movement of the engine at a definite speed during this delay varies only as the time of closing, and this figure varies directly as the square root of the weight of the valve, and inversely as the strength of the spring. Hence, the angular movement can be diminished 5% by increasing the strength of the spring by 10% or by reducing the weight of the valve by 10%. The price to pay for such a gain is the increased work on the valve gear and the consequent danger of excessive wear or breakage.

The greatest road speed ever attained by this engine in low gear worked out at 2,600 r.p.m. On top gear it can barely touch 40 m.p.h. when in perfect order. I am not an expert in these matters, and should value the comments of those who are.

J.H.H.

THE NEW A.B.C.

Sir.—I am interested to note a few criticisms of the A.B.C. motor cycle in your issue of March 27th.

Mr. H. Walker says he was looking for a more accessible and a simpler machine, and quotes "Ixon's" suggestion of minimising bolts, flanges, awkward corners, etc., which are difficult to keep clean.

This, I think, everybody will thoroughly agree with, but I am quite sure that if Mr. Walker studies the design again, or, better still, examines an actual model, he will most probably change his opinion on this point.

It is the old question of the best compromise between reliability, strength, accessibility, efficiency, and various other items, all of which have their degree of importance, and a designer can generally only improve one point by sacrificing another.

For instance, it is easy to keep a machine clean if it is not fitted with a gear box or clutch, or springing, etc., etc., but the machine is then not very pleasant to drive, or so useful, and the same argument might apply to any single item of the design.

The engine unit is certainly not so simple and smooth externally as a bare single-cylindere engine, such as we have been accustomed to see, but the gear box is not hung under the bottom bracket with the clutch sticking out of one side, operated by external mechanisms with innumerable joints, and the primary drive does not consist of a chain running at high speeds, which makes a noise and has to be housed in a bulky-looking chain case; and the oil is not carried in a tank with protruding hand pump, drip feed, external piping, etc., nor is the change-speed lever attached to the top tube through bell cranks, rods, and hinge pins; but all these items are made in one enclosed and compact unit, which can be taken out of the frame with one spanner and a pair of pliers, and it is completely protected underneath and in front by an efficient shield.

The change in length of the chain wheel centres, on account of the rear stays not pivoting exactly on the centre of the driving sprocket, is one of those theoretical points which I doubt if anyone has ever been able to make evident in practice. The variation in length is not one-quarter of the amount the chain stretches under the pull of the engine, and in the A.B.C. machine in particular it is a matter of a few thousandths of an inch throughout the whole range of the springing.

Mr. Walker refers to the timing train of five wheels and the four-speed gear box and bevel all taking a percentage of power, and I have come to the conclusion that Mr. Walker's ideal must be a single-gear machine, such as were used in 1910.

In the timing gearing there is one wheel on the crankshaft, one driving the camshaft, one driving the magneto, and, in order to get the correct ratio, two driving the oil pump. These two latter could easily be obviated by returning to an oil tank and hand pump, drip feed lubricator, etc., with its consequent constant attention and extravagance in oil, coupled with shorter life for the engine, and I do not think that many motor cyclists would care to return to this for the sake of two small gear wheels running in oil and absorbing an infinitesimal amount of power.

Then Mr. Walker says the gear box may give direct drive on top, but not in the sense that it does on other machines, as it really gives direct drive to the bevel only. If Mr. Walker will think again he will see that by putting in the bevel I have reduced the number of drives from 4 to 3, as compared with all-chain machines, which have one drive from the engine sprocket to the chain, one from the chain to the countershaft, a further one from the countershaft to the rear chain, and a final one from the chain to the rear sprocket.

In the A.B.C. machine there are the two last mentioned, and in place of the two first mentioned (which is an unpleasant high speed engine chain, necessitating adjustment and difficult adequately to lubricate, noisy in operation, inaccessible, and very subject to back-lash) there is one reliable bevel drive completely enclosed, yet accessible, much smaller in bulk, adequately lubricated, and quiet in operation.

With reference to Mr. John Holland's criticisms and suggestions, I will take these in the order he names:

1. "Why should the front brake not be placed on the left of the wheel, thus allowing the speedometer drive its usual place on the right?" This was an error on my part, and has since been modified. At the same time, I might mention

that it was only modified in case the motor cyclist wished to fit his own pet speedometer, as the A.B.C. speedometer drive is incorporated in the gear box.

2. "Mudguards seem unduly narrow, with valances close to the wheel." These mudguards are not at all narrow in the actual machine.

3. "The splash guard is not high enough for winter riding." Careful experiments have been made in this direction, and it is only at very high speeds and on very wet roads that splashes can reach the top.

4. The oil spray directed on the chain is, I agree, a little doubtful, and is being thoroughly investigated.

5. "Why not lubricate the fork links by drilling the steel pins and fitting a grease cap on the end of each?" I should like to know what benefit Mr. Holland claims by this method? As far as I can see, the grease or oil has to pass down a long small hole, and through a further hole or holes, drilled into the side of the pin. This weakens the pin, increases the amount of drilling, increases the length of path of the thick lubricant, places the greaser in a more vulnerable position, and has in car shackles generally found to be very bad. Why should not the greaser be placed right on the very spot where the grease is required?

GRANVILLE BRADSHAW.

Sir.—I am glad to see Mr. Bradshaw has made an engineering job of his new effort. I had a little to do with his pre-war models, which were also beautiful little engines. On the power unit drawing I fail to see the engine suspension lugs. How is this attached to the frame? Also, would not a support for the carburettor be advisable, as the weight of the induction pipe and carburettor tend, with vibration, to make an air leak at the cylinder joint? Also, does only the left cylinder exhaust valve open when the lifter is raised, as is apparent by your diagram?

As for minor improvements, what are nicer or cleaner than disc wheels—stampings, not those awful spokes; and the toolbox, could not one be made on each footrest, as they would be accessible, large, and neat? The rear mudguard seems hardly big enough.

C. E. SMITH.



The parish church at Richmond, Yorks. Houses and shops form part of the building

LEST WE FORGET.

Sir,—Referring to *The Motor Cycle* of March 27th, page 292, "Occasional Comments," by "Ixion," on "Engine Bearings." Your gifted contributor refers to the increased application of roller bearings to the big ends in the new season's goods. May we call your attention to the fact that roller bearings were fitted to the Rudge gudgeon pin and big end bearings in April, 1912 (seven years ago).

RUDGE-WHITWORTH LTD.

BORROWING AN IDEA FROM HENRY FORD.

Sir,—I think your contributor would do well to pay back the idea he is borrowing from Henry Ford, so far as its applicability to cycle car design is concerned. Here we have the two extremes: one a tractor of about 4 m.p.h. speed, where weight and short wheelbase are an advantage; the other in which lightness is a *sine quâ non*. One might just as well start designing a traction engine on the lines of a Levis. If enclosure of cardan-shaft, etc., is desirable, well, put a case round it, and do not increase the unsprung weight enormously merely to close in the shaft. I do not see him selling many to customers when explaining the 30 m.p.h. governor stunt to prevent overturning of the chassis.

In your description of the Warner spring frame attachment you state that the rigidity of the frame is not lessened. I beg to differ. With an ordinary frame the axle supports are rigidly connected by the axle, whereas this connection is now removed. For solo riding probably the arrangement might do, but get a heavy sidecar attached to the chain stays, and see the "whip" taking a corner at speed.

WM. A. DAVIS, A.M.I.M.E.

ALUMINIUM COOLING.

Sir,—"By the way," said the Cheshire Cat, "what became of the Baby?"

"It turned into a Pig," replied Alice.

"Ah!" said the Cheshire Cat; "I thought it would!" (I quote from memory.)

What a world of trouble! The little thing decked out so convincingly: "as large as life and twice as natural"—to its nurse; and along comes that wretched cat, with a grin half an hour in length, and points out that the dear infant's clothes are lumpy in the wrong places. Dear, dear!

All very well to laugh, fellow readers, but do you realise to what sort of life the inventor is condemned in this nominally free and doubtfully happy country?

It will be within the recollection of many readers that during the month of July, 1917, there appeared in sundry issues of this journal, with appreciative editorial comments, a history of the genesis of aluminium cooling; also an *in extenso* reproduction of what the Editor was good enough to designate a "master patent," dated August 12th, 1898. This specification contained the following phrases:

"I provide the tube, cylinder, or other body from which heat is to be radiated with a partial or total covering of a metal having a higher conductivity than the metal of which the tube or cylinder itself is composed. . . . It is, of course, necessary that the conductive covering should be applied to the radiating body in such a way as to ensure intimate contact between the metals of which the body and covering are composed. . . . In order to ensure intimate contact between the metals, it is preferable to cast the gills in position upon the cylinder, but other methods . . . may be employed. . . ." (Tapering, shrinking, etc., described.)

Referring to the rapidly extending successful use of this invention, the Editor added remarks that, unfortunately, are as true to-day as in 1917:

" . . . War-time developments on aeroplane engines have demonstrated that such a patent might have been worth annually many thousands of pounds. . . . He (the inventor) was too much in advance of the times, and suffered as many other far-sighted men have done. . . . We regret to say that he saw no direct benefit from the patent. . . . It is galling to think that a patent expires automatically at the end of fourteen years, when during that period no one recognises the patent, and yet subsequently the scheme covered by the patent specification becomes common practice. . . . Mr. Ayton's patent was a strong one, and exceptionally lucid in expression."

No, sir, no direct reward—in cash. But think of the joy and gratification of seeing British officers rewarded and decorated for the successful exploitation of the very form

illustrated in the patent drawing, and the delirious delight of opening *The Motor Cycle* in 1919 and reading the following "modest" and "courtous" pronouncements over the signature "Edgar Russell":

"I have been experimenting for some considerable time with a view to obtaining better cooling of motor cycles (*sic*) and other air-cooled engines. . . . Numerous attempts have been made to fit ribs to iron or steel cylinders. ANY method of CASTING ON or shrinking the ribs over a barrel is BAD. . . . This" (his cast-on) "construction marks a distinct advance in CYLINDER DESIGN. . . . The method should be of great value," etc. (The variations in type are mine.)

And "this construction"? It proves to be, I gather, an application of a not very reputable art or device familiar to most foundrymen. It has been largely used for the "faking" of defective castings and the manufacture of cheap bedsteads. The claims made for the results indicate a joint similar to that obtained in the very engine illustrated on page 30, issue of July 12th, 1917, and also in the boiler tubes with which the comparative steam-raising tests were successfully carried out, *circa* 1899!

Evidently, therefore, in order to find the real novelty "of great value" which constitutes such "a distinct advance," we must take Mr. Russell's advice: "wait" a few months "and see" what the Comptroller leaves in his final specification.

"Well," says the reader, "and what has all this to do with me?"

Simply this, Mesdames et Messieurs: I have every reason to believe that ere long efficient and satisfactory waterless cooling for every class of motor vehicle will be *un fait accompli*, and that this desirable result will be attained by intelligent improvement upon the already successful system that Mr. Russell pretends, without any show of justification, to condemn. I therefore consider it inadvisable that prejudice should be engendered against waterless cooling by the booming of alleged "improvements" which are essentially *reversions*, and which, as such, are likely to be the cause of disappointment and dissatisfaction. Real progress, in the sense of the attainment of an efficiency comparable with that of a good water-cooled engine under equal conditions, is only to be arrived at by due consideration of all the essential factors, and these embody certain points that, to the best of my knowledge, have never yet been placed before the public or the trade in any published communication. As to this, I will, if the Editor desires, it, be more explicit at the earliest moment I am free to do so.

R. AYTON.

SPARE PARTS FOR OLD MODELS.

Sir,—I read with some surprise in *The Motor Cycle* (March 27th) a letter, signed "J." complaining of unfeeling treatment by A.B.C. Motors, Ltd., in the matter of spares for old models. I should just like to say that I am a rider of a 1915 A.B.C., and on the few occasions on which I have required spares, even during the war period, I have not only received the most courteous treatment and attention, but the spares as well.

I am prepared to admit that there is room for improvement in the way riders are treated by many firms in this matter, but I have always received the best possible attention from A.B.C. Motors, Ltd., who, if they merely retain the same standard of excellence in post-war productions as they did pre-war, deserve the best wishes of the motor cycling public.

FRANK MORRIS.

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CYLINDERS.

Extracts from a Paper read before a Graduate Section of the I.A.E.

ON Tuesday of last week Mr. A. Niven read a paper on "Cylinders" before the Coventry Graduate Section of the Institution of Automobile Engineers. Mr. A. A. Remington, of the Wolseley Co., was in the chair.

The major part of the paper was too technical for the average motor cyclist, but there was much to interest him in view of the consensus of opinion (many times expressed in these columns) that aero engine practice will be reflected in future motor cycle engines.

The author pointed out that in aero engines the cylinders weigh from 20% to 25% of the total weight of the engine, and for that reason the cylinder has received, and is still receiving, probably more attention than any other part.

"The weight saved by the adoption of aluminium is not so great as one

having no pockets or corners to cause trouble. Spark plug can be situated at the centre or offset as desired.

"(b.) Domed head, with overhead valves located at an angle. This type presents no machining difficulties, and has also a symmetrical head. The diameter of the valves in this type is limited by the diameter of the cylinder bore, unless valve cages or a detachable head is fitted. Spark plug is offset on crown or located at the side.

"(c.) Flat cylindrical head, easily machined, with valves side by side in the crown. The remarks regarding diameter of valves and location of spark plug in type (b) also apply to this type.

"(d.) Chevron head. The valves, the diameter of which may be slightly larger, according to angle of chevron, than those in types (c) and (b), are located at an

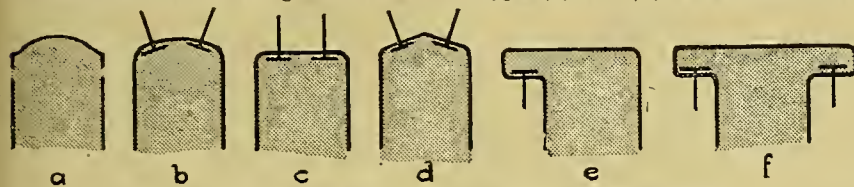
dying a natural death. The only thing in their favour lies in the valve position, which facilitates the 'grinding in' and removal of valves.

Aluminium Cylinders.

"Aluminium from a commercial, combined with an efficiency, point of view is the favourite material for air-cooled cylinders, and, provided a good contact is made between the cylinder and its liner, and an efficient fan and cowling system is incorporated, the production of an engine as good as any modern water-cooled high efficiency engine is quite within reason. The numerous advantages such as low petrol consumption, less weight and cleanliness, would outweigh the loss of power in propelling the air fan.

"The making of a satisfactory contact between the liner and cylinder is a serious problem which up to the present has not been solved. The cylinder, when heated, expands away from the liner, and the conduction is partially destroyed, a leak occurs, accompanied, of course, by an immediate drop in power. Numerous attempts have been made with the idea of combining the conduction qualities of aluminium with the strength and wearing surface of cast iron, at the same time avoiding a troublesome joint. Thus, we have the Buchanan bimetal construction in which an iron shell is encased in aluminium and the Russell process of casting aluminium fins in position on a cast iron cylinder barrel, both inventors claiming contact to be perfect under all conditions. Die casting aluminium fins on to a steel or cast iron liner has also been tried."

During the evening it was mentioned that the conductivity of aluminium may be increased about 15% with air-cooling and 6% with water-cooling by stove enamelling the rough cast surface, while the conductivity of ordinary cast iron cylinders, such as are used in motor cycle engines, is increased by about 7% by this method.



Types of cylinder heads and valve positions shown diagrammatically.

would at first imagine," said Mr. Niven, "taking into consideration the extra wall thickness required and the additional weight of a cast iron or steel liner and valve seats. The extra liner and valve seats would, of course, be unnecessary in the case of a sleeve valve engine, where the sleeve works direct in the cylinder, and provides the working surface for the piston. Cast iron pistons working direct in aluminium have been tried, but without success, the wear and surface of the cylinder bore being far from satisfactory.

"The glass surface attained under working conditions in the bore of a cast iron cylinder is ideal—a fact that should not be lost sight of when piston friction and absorption of heat by the cylinder wall are considered.

angle in the cylinder crown. Spark plug is usually placed at the side.

"(e.) T head, which cannot be machined. The valves are located in pockets on opposite sides, the spark plug being located above the inlet valve.

"(f.) L head, like its forerunner, the T head, cannot be machined. The valves are side by side in a pocket at the side.

"In types (a), (b), (c), and (d), where the heads are machined and polished, thereby preventing carbon deposit and pre-ignition, accurately equalised compression spaces can be obtained, with beneficial results in power and efficiency.

"Types (e) and (f), with their varying compressions owing to unmachined heads, their uneven cooling and distortion, are

Position of Valves and Form of Compression Space.

"The chief difference in cylinder design lies in the location of the inlet and exhaust valves, and in the form of the compression or combustion space. The loss of heat through the cylinder wall and crown depends very largely upon the area of the compression space surface, so this is usually designed so as to have the least wall area in proportion to its cubical contents. From this point of view, it will be obvious that the hemispherical crown is ideal, this type of head being approached in the sleeve valve engine cylinder, whereas in a poppet valve headed cylinder the surface is about 62% greater than that of a corresponding hemispherical head.



"The various types of heads and valve positions are shown diagrammatically above.

"(a.) Sleeve valve, with domed detachable head, which can be machined easily. The compression space is symmetrical,



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QUESTIONS AND REPLIES

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C.4, and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

Enamelled Brake Rim.

?

I have had my Douglas wheels re-enamelled, and the firm have enamelled the plated belt rim by mistake. Please say if it is possible to remove the black without damaging the plating.—W.H.W.

The enamel may be removed by soaking the rim in a hot solution of caustic potash, and scrubbing off with a brush. Why have the rim plated? It is a most unsuitable finish for a belt rim.

Difficult Starting.

?

I have a 1913 twin Rex, which I cannot start up. I have just had the magneto down and cleaned it. On the bench it sparks well, but on being replaced it will hardly spark, the sparks being very faint. Which cylinder is the best to start timing from—the front or back? The engine is also very hard to turn. I should be greatly obliged for a little information on these points.—A.G.

The reason for the magneto not sparking when on the machine is probably due to the fact that you do not rotate the engine fast enough. It is customary to time the engine first of all in the back cylinder, which in most cases is No. 1. The reason why the engine is hard to turn is not clear to us. You must find this out for yourself by examining it carefully to see if there is any stiffness anywhere, after having injected a little paraffin into the cylinder.

Two-stroke v. Four-stroke.

?

I have discarded a 4 h.p. combination, and am thinking of purchasing a lightweight. I have had no experience of two-strokes, but am told (1) that they are less economical (of petrol) than four-strokes; (2) they are more difficult to start; (3) they require more frequent decarbonising, and (4) are not such good hill-climbers. I should be glad of your opinion on these points. I think a 2½ h.p. two-speed of either variety ought to take me anywhere.—J.A.B.

(1.) This is quite true. (2.) This does not follow, if the carburetter is properly adjusted. (3.) A two-stroke may need more frequent decarbonisation if over-oiled. (4.) This is quite wrong. The average two-stroke is a better hill-climber for its size than a four-stroke. The two-stroke is not quite so economical in petrol as a four-stroke, nor is it so fast on the level, but it is a far better hill-climber than a four-stroke with the same engine dimensions.

Magneto Trouble.

?

I have a two-stroke motor cycle, which is fitted with a magneto, and which is without name or number. Unlike a Bosch, this magneto makes and breaks contact from a face disc. After riding five or six miles, the engine will suddenly pull up. I dismount, take the cap off the magneto, syringe out the front with petrol, place the cap back again, remount, and go merrily for another five or six miles, when the same thing happens again. Will you please tell me the cause and suggest a remedy?—MAG. KEN.

The magneto is probably a U.H., handled by Messrs. S. Wolf and Co., 115, Southwark Street, London, S.E.1. The trouble seems to be due to over-lubrication. Some of these magnetos, being provided with ball bearings, have the bearings packed with grease, and they will run for several years without attention. If you have been attempting to oil the magneto, or oil is reaching the magneto, then the trouble of which you complain would occur. At first, we were inclined to think that the trouble was due to a faulty condenser connection, which would cause excessive sparking

at the platinum points, but if this were the case merely washing out with petrol would not, we think, have cured the trouble, as it would necessitate the platinum points being touched up with a file.

Sidecar Track.

?

Can you tell me what is recognised to be the correct distance between the motor cycle and sidecar wheels? My 4 h.p. combination is very heavy on tyres, and it seems to me that my chassis is wider than the average; the distance from the centre of the cycle to the centre of the sidecar wheel is 3ft. 7½in. I have checked over the alignment, which is correct according to some articles which appeared in *The Motor Cycle* some time ago. There is a distinct pull on the front wheel towards the sidecar when riding.—H.D.

The track is quite an average width. Both sidecar and cycle wheels should be absolutely in alignment, both vertically and horizontally. If the front connection is strained or too long, the sidecar wheel will naturally wear the tyre quickly, and pull over. See that your connections are rigid, and note whether the sidecar stub axle is bent.



Why stand? This question was answered by Mrs. Kent, the inventor of the Moto-Frip, one of the first motor scooters, which appeared in 1911, for in 1913 it re-appeared with a bucket seat.

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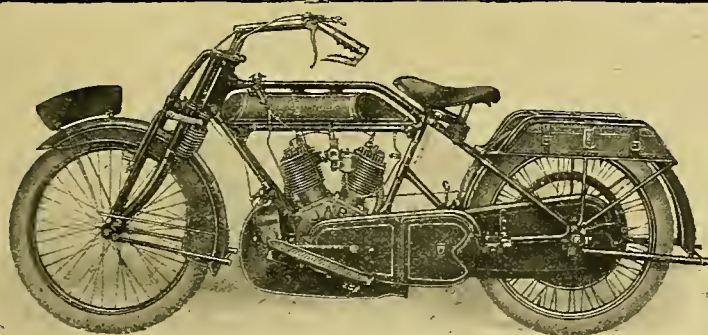


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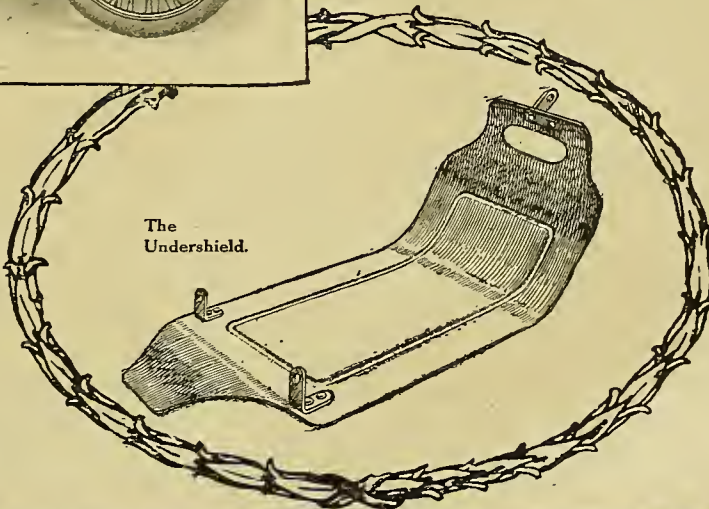
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All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.4), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

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For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge, which must include the words Box 000, c/o "The Motor Cycle." Only the number will appear in the advertisement. All replies should be addressed No. 000 c/o "Motor Cycle," 20, Tudor Street, E.C.4. Replies to Box Number advertisements containing remittances should be sent by registered post.

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Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pays carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged; when under £10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

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Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

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A.B.C.

A.B.C.—Earliest deliveries. Your name on our list ensures this.—Martin Mitchell, Ltd., Stafford. [7658]

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LIVERPOOL and District Agents for A.B.C. Place orders now to secure early delivery.—Victor Horsman, Ltd., 9, Parr St., Liverpool. [0003]

A.B.C.—Sole agents for these famous machines. Orders booked now for early delivery.—Chandler, Heve, and Williams, San St., Hitchin. [0996]

JONES Garage.—We are in a position to accept orders for A.B.C. motor cycles; deposits optional; delivery April or May.—Broadway, Muswell Hill, N. [0991]

A.B.C.—Conlans, Ltd., Enstbourne, distributors for Sunsex, are looking orders for the earliest deliveries; sub-agencies considered where not represented. [6786]

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IMPORTANT NOTICE.

Owing to the Easter Holidays, the issue of "The Motor Cycle" for April 24th must be closed for press earlier than usual. All copy and instructions for Miscellaneous Advertisements in that issue must, therefore, be in our hands not later than first post on Wednesday, April 16th.

MOTOR CYCLES FOR SALE.

A.B.C.

ISLE of Wight.—Witham Bros., Newport, I.W., are Island agents for A.B.C. machines. Full particulars on request. Orders being booked for earliest delivery. [7515]

NORTH Ayrshire.—Place your orders now. Early delivery of A.B.C. Demonstration runs arranged by appointment. You are interested, so write.—Uawin, Glengarnock. [X7022]

A.B.C.—We are now taking orders for earliest deliveries, which commence about May; book early to be in time.—P. Ellis and Co., 360, Lillie Rd., Fulham, London, S.W.6. [5373]

WE Are Now Booking Orders for earliest deliveries of A.B.C. motor cycles. Secure an early delivery by placing your order with us now.—Dunwells' Garage, Wigan. Tel.: 328. [X3219]

A.B.C.—Book early and prevent disappointment. A Specification and full particulars will be sent on application.—The Spalding Motor Co., Ltd., Spalding, distributing agents for Lincolnshire. [X6969]

DAN BRADBURY, 224, London Rd., Sheffield, sole A.B.C. distributing agent for Sheffield and district, will give you earliest possible delivery of the new A.B.C. motor cycles and light cars. [7270]

LATE Model T.T. A.B.C., 2-speed countershaft, front and rear springing, steel cylinders, overhead valves, very fast, splendid condition; best offer over £75.—Benger, 7, St. Matthews St., Rugby. [7294]

A.B.C.—Sole Agents, wholesale and retail, for Cornwall and Devon; sub-agencies now being allotted. Liberal terms and favourable deliveries; exchanges.—Mandes, 100, Great Portland St., London, W.1. [6983]

Abingdon.

A BINGDON 3½ h.p. Combination, 2-speed, free engine, handle start, lamp, Cowey; 35 gns.—17, Tamworth Park, Mitcham. [7563]

A BINGDON 3½ h.p. King Dick, 2-speed, clutch, h.b.c., handle starter, new extra heavy Dunlop, good condition; £35.—102, Lothian Rd., Brixton, S.W.9. [7312]

A.J.S.

CROW Bros., Guildford.—A.J.S. Agents since 1912. Write us for your requirements. [9777]

A.J.S. Combinations.—District agents, Hilton, Sharp and Co., Ltd., Foxhall Rd., Blackpool. [X7105]

1919 A.J.S. Combinations.—White Merrick's Stores, 174, Listerhills Rd., Bradford. Phone: 2439. [X2430]

A.J.S. Combination.—Book your order now for earliest delivery.—Parker's, Bradshawgate, Bolton. [7215]

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A.J.S.—For quick deliveries try the sole Leicester shire agent, Will Chapman, 113 Belgrave Rd., Leicester, the first appointed A.J.S. agent [3531]

A.J.S. 6 h.p. Combination, 1915, stored 18 months, wind screen, and all accessories; trial with pleasure; £90.—McCurran, 297, Nantwich Rd., Crewe. [X7507]

A.J.S.—Exeter Motor Cycle and Light Car Co., Ltd., Bath Rd., Exeter, and 28, Tavistock Rd., Plymouth. Sole agents. Now booking for earliest deliveries. [0007]

A.J.S. 1916 6 h.p. Combination, hood, screen, lamps, horn, mirror, spare wheel and tyre, very fine condition; £125.—Halifax Motor Exchange, Union St. South, Halifax. [7305]

A.J.S.—For the earliest possible deliveries of 1919 models, specifications, and super service, try the A.J.S. Specialists, The Walsall Garage, Wolverhampton St., Walsall. Phone: 444. [4668]

A.J.S. 6 h.p. 3-speed Combination, late 1913, stored since 1915, in excellent running condition throughout; any trial or examination; £63, complete.—Cotton, Coalville, Leedbury. [7347]

LATE 1915 2½ h.p. A.J.S., 3 speeds, kick starter, handle-bar controlled clutch, Lucas lamps, 2 generators, new tyres, stored 18 months, like new; £55, or nearest.—Lt. Hallam, Inkerman Barracks, Woking. [X7586]

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A.J.S. 1914 2½ h.p., 2-speed, hand clutch, Amac, P. and H. and rear, neat coach sidecar, a smart lightweight combination, owner maimed, getting run about, £60.—Letters only, 27, Rosemary Av., Finchley, N.3. [7337]

A.J.S. 1916, 2½ h.p., 3-speed, clutch, kick start, all enclosed chain drive, P. and H. lamps, Stewart speedometer, done 700 miles only, stored since 1916, and is practically as new; price £60.—Watson, High St., Aldeburgh, Suffolk. [X7542]

A.J.S. Spares, prompt delivery.—Cyril Williams, Tel. Chapel Ash Depot, Wolverhampton. [9184]

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ALLOD, 2-stroke, 2-speed gear, with hand-operated clutch, kick starter; £65; immediate delivery.—Parker's, Bradshawgate, Bolton. [7221]

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ALLDAYS Allon, 2½ h.p., late model, excellent condition, ready to drive away; £37.—Vivian Hardie, Ltd. 24, Woodstock St. (off Oxford St.), Bond St., W.1. [7446]

SACKS, motor cycle engineer, has 1914 Alldays Matchless 2-stroke, thoroughly overhauled; £20.—Alfred Sacks, Motor Cycle Engineer, 39-40, Rednal Terrace, Great Church Lane, Hammersmith. [5797]

ALLDAYS Allon, late 1915, 2½ h.p., 2-stroke, 2-speed, and hand-controlled clutch, Lucas lamps, Stewart speedometer, and horn, tyres and belt as new, excellent condition and mechanically sound, been stored for 3 years; a genuine bargain, £40.—Gordon's Motor Works, Royston, Herts. [7591]

ALLDAYS Matchless, 6-8 h.p., even firing twin, chain drive, 3-speed, Bosch, Sensapray, speedometer, horn, pillion, P. and H., new coach sidecar, screen, hood, little used, under 3,500, equal any combination; 100 gns.; garaged Sulway Motor Works, Woodford.—53, Empress Av., Woodford, Essex. [7425]

Ariel.

ARIEL.—Caffyns, Ltd., Eastbourne, for the earliest possible deliveries. [6788]

CROW Bros., High St., Guildford, Ariel agents since 1913, have 1919 models in stock. [5299]

ARIEL, 1919, 3½ h.p., just from makers; list price; one only.—Cooper, 6, Caple Rd., Harlesden, N.W. [7552]

ARIEL, 3½ h.p. and 6-7 h.p.; early deliveries.—Speakman, Ariel Expert, 7, Rochdale Rd., Harpurhey, Manchester. [5265]

3½ h.p. Ariel Combination, 3-speed, clutch, lamps, speedometer, etc., perfect condition; £45.—Seen, 239, Liverpool Rd., Islington, N. [7369]

ARIEL, 5-6 h.p. twin, and sidecar, 2-speed gear, Bosch mag., in good running order; price £20.—Manners, Bankside, Dane Hill, Sussex. [X7485]

ARIEL, 3½ h.p., just arrived from works; £85, or exchange, will allow full value of your present machine.—Bunting, Mason's Av., Harrow. Phone 193. [7594]

ARIEL 3½ h.p. 3-speed Countershaft Combination, 1919 model, hardly used; £100.—Longman B. os., 2, King's Parade, Uxbridge Rd., Acton. Tel.: 157. [7699]

Arno.

ARNO, 3½ h.p., T.T., September, 1915, Sensapray, E.I.C., Drums, mileage 500, condition, appearance as new; £40.—Riddle, Ashkirk, Hawick, Scotland. [X7477]

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WALL Auto-Wheel, good running condition; 9 gns. bargain.—Stone, Midland View, Belper. [7330]

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AUTO-WHEEL, in good running order, and gent's B.S.A. cycle; 16 gns.—Booth, Eglantine, Brockley View, Forest Hill. [7350]

WALL Auto-Wheel, in fine condition, complete with all fittings for lady's or gent's cycle; price £12/12.—Yandle, Ilminster. [7215]

AUTO-WHEEL, 1914 model, complete, and in excellent condition; £15.—The Eastern Garage Co., 418, Romford Rd., Forest Gate, E.7. [7417]

Bat.

BAT-J.A.P., 1915, 6 h.p., 3-speed, clutch, K.S. coach sidecar, speedometer, lamps, new condition; £90.—55, Appach Rd., Brixton Hill. [7459]

8 h.p. Bat-Jap and Sidecar, sprung frame, Bosch, B. and P., variable jet, lamps, horn, etc.; £25.—40, Harvey Rd., Hornsey, London. [7465]

BAT-J.A.P. Twin, 10 h.p., Bosch, 3-speed, in good condition; what offers!—Brown, 66, Inverness Terrace, Hyde Park, London, W. [7163]



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MOTOR CYCLES FOR SALE.

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BAT-J.A.P., 8 h.p., 3 speeds, kick starter, Millford coachbuilt sidecar, excellent running order; accept £65.—Drake and Fletcher, Maidstone, Kent. [6733]

MODERNISED 3½ h.p. Bat-De Dion, Cl. tyres, perfect, in splendid running order; approval willingly; 15 gns.—Box 1,394, c/o The Motor Cycle. [7652]

BAT, 4½ h.p., N.S.U. 2-speed, B. and B., accumulator ignition, going order, good tyres, 2 bikes, in good order; £17.—J. W. Thorpe, 13, Broadbottom Rd., Mottram, Manchester. [7170]

BAT-J.A.P. Special Racing Model, 7-9 h.p. twin, o.h. valves, J.A.P. carburettor, Bosch mag., including all accessories, a fine machine; £55; write appointment.—37, Daleham Mews, Belsize Lane, Hampstead, N.W. [7529]

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BLACKBURN.—Caffyns, Ltd., Eastbourne, for earliest deliveries of all models. [6785]

CROW Bros., High St., Guildford, are old Blackburne agents, and can give early deliveries. [5300]

BLACKBURN.—Sole agents, Book now for early delivery.—Chandler, Reyne and Williams, Sun St., Hitchin. [0999]

BLACKBURN.—For earliest deliveries come to the sole agents, Barnett and Whetstone Garages, Ltd., 202-4, High St., Barnet, Herts. [7616]

BLACKBURN.—Sole Agents, wholesale and retail, Cornwall and Devon; sub-agents now being appointed.—Mandes, 100, Great Portland St., London, W.1. [6584]

JONES' Garage.—We can accept orders for all models of Blackburne motor cycles; delivery expected in April; deposits optional.—Broadway, Muswell Hill. [0992]

Bradbury.

1914 4 h.p. Bradbury Combination for sale.—Apply, J. J. Pitt and Sons, Bakers, Deptford. [7281]

3½ h.p. Bradbury, Bosch, sound condition, last; bargain, £26.—Page and Gilling, Melton, Suffolk. [7505]

BRADBURY, 4 h.p., 1914, 3-speed, clutch, special coach sidecar, horn, lamps, tools, spares; offers.—111, Green Walk, Crayford, Kent. [X7483]

4½ h.p. Bradbury, as new, very fast, excellent condition, Bosch mag., B.B.; £32, no offers.—G. Denton, 75, Etta St., Deptford, S.E. [7207]

BRADBURY.—For the earliest possible deliveries of 1919 models try the sole Manchester agent, Tom Davies, 229, Deansgate, Manchester. [6652]

BRADBURY, late 1914, 2-speed, clutch, kick starter, chain driven, coachbuilt sidecar, very little used, owner been in army; £60.—Creese, Sun St., Hitchin. [7242]

BRADBURY, 1914, 4 h.p., 2-speed, kick start, clutch, and coachbuilt sidecar, in splendid condition, engine just overhauled; ride away; lamps, tools, etc.; £50, no offers.—Brown, Hotel, Endon, Staffs. [X7540]

BRADBURY Combination, 4 h.p., 2-speed, all chain, countershaft, clutch, Bosch, new chains and Dunlops, lamps, tools, overhauled; £40; any time except Saturday, Monday, and Tuesday.—98, First Avenue, Bush Hill Park, Enfield. [X7499]

Brough.

3½ h.p. Brough, 2-speed, flat twin, very O.T., an 32" Foster fier; £67.—Clapham (Motors), King George St., Greenwich. [X7644]

BROUGH, 2-speed countershaft, speedometer, fast, powerful, splendid condition; £60, lowest.—804, Seven Sisters Rd., Tottenham. [7182]

VERY Fast 1917 T.T. Brough, 3½ h.p., practically new, adjustable pulley, Klaxon, Lucas lamps; £55.—Box 3,218, c/o The Motor Cycle. [X7190]

BROUGH, 5-6 h.p., Bosch, Sensapray, 3-speed Armstrong gear, speedometer, lamps, horn, with Canoelet C.B. sidecar; £60.—Barnes, 2, Flat, 388, Finchley Rd., N.W.2. [7549]

B.S.A.

B.S.A., 3-speed, 1919 models in stock.—Reys, 378, Euston Rd. [2972]

1919 B.S.A. K., never ridden; reason given; £77.—20, Sylvan Rd., Snaresbrook. [6856]

NEW B.S.A.'s in stock; immediate delivery Model K.—Alexander, Agent, Wallasey Village. [1506]

B.S.A., 1916, and Mills-Fullford sidecar, accessories, excellent condition; £75 lowest.—Edwards, Hillgrove, Wells, Somerset. [X7385]

B.S.A., 4½ h.p., 1915, 3-speed countershaft, all-chain drive, speedometer, lamps little used; £68.—4, Station Buildings, Woodside, S.E.25. [7607]

B.S.A. Tourist Trophy, not done 200 miles, perfect condition, enamelling and plating new; £50.—Allen, 10, Alexandra Gardens, Folkestone. [X7554]

B.S.A., 3½ h.p., 1912 clutch model, a splendid solo mount and good condition in every way, ready for faster; any trial given; price £35.—Tegg, Camille, Pangbourne, Berks. [X7441]

B.S.A.—For the earliest possible deliveries of 1919 models, specifications, and prices, sole district agents, The Walsall Garage, Wolverhampton St., Walsall. Phone 444. [4669]

MOTOR CYCLES FOR SALE.

B.S.A.

B.S.A. Combination, new 1917, 4½ h.p., countershaft 3-speed, mileage 500, Dunlop and Palmer tyres, Burbury sidcar, new, not run 20 miles; £95-16, Bickershaw Lane, Abram, Wigan. [X7364]

B.S.A., 1914, 3-speed countershaft gear, 4 h.p., chain-sum-belt, excellent condition, tyres new, speedometer, lamps and horn, not earlier than 4 o'clock. £70-27, Cranborne Rd., Barking. [7559]

1914 3-speed Countershaft 4½ h.p. B.S.A. and excellent case sidcar, first-class condition. Lucas lamps, horn; nearest £70 secures.—T. Pearce, Melrose, Boughton Park, Worcester. [X7602]

B.S.A. Late 1913 Coach Combination, Model H, F.R.S. lamp set, mechanical horn, spare butt-end tube, tools, a first-class outfit; £75, no offers.—27, Melrose Gardens, Hammersmith. [7290]

B.S.A., 1916, 4½ h.p., all-chain countershaft 3-speed, speedometer, full set spares, tools, new cylinder, mudguards, kick starter, lamps, horn; what offers?—Newton, Rose Cottage, Little Hulton, Bolton. [X7423]

B.S.A., August, 1917, Model K, 4½ h.p., 3-speed, clutch and kick start, Miller head lamp and generator, Lucas rear generator, Perry's links, mechanical horn, mileage about 3,000, condition excellent; trial by appointment; £75.—The Elms, Gosforth, Newcastle-on-Tyne. [7507]

B.S.A.—The Birmingham City agents and specialists who confine their business absolutely to B.S.A. manufactures always holds the most complete stock of motor cycles, sidecars, bicycles, etc., and can give immediate delivery of all replacements.—The County Cycle and Motor Co., 307-8, Broad St. Phone: Midland 733. [7250]

Calthorpe.

CALTHORPE Lightweight, 2 speeds, free engine, good order, ride away; £25.—Davidson, Acacia, Centre Av., Acton Vale, W. [7455]

CALTHORPE, 1914, 2-stroke, 2-speed, lamps, horn, tools, thorough condition; £32.—Pickett, 8, Court Rd., Tunbridge Wells. [7449]

CALTHORPE, brand new 2-stroke, 2-speed, Klaxon lamps; £45; governors car wanted.—Percy, 17 Crescent Gardens, Wimbleton Park. [7540]

CALTHORPE Junior, 1914, 2 speeds, perfect condition, little used; £25; combination wanted.—After 6, 24, Garden Av., Streatham Rd., Mitcham. [7612]

CALTHORPE J.A.P., 1915, 2½ h.p., 2 speeds, free engine, Senspray, lamp, horn, tyres new, condition good; £40.—Buck, Garage, 27, Sackville Rd., Brixton Hill. [7198]

CALTHORPE J.A.P., private owner, 2½ h.p., fine condition, equal new plating, enamel perfect, Senspray, X1 All saddle; £38/10.—Webb, 5, School Rd., Hounslow, W. [7239]

CALTHORPE Lightweight, 2 speeds, free engine, and other improvements, splendid order; £27/10.—302, Albany Rd., Camberwell, S.E. [7366]

CALTHORPE J.A.P., 1915½, 2½ h.p., free engine, Enfield gears, P. and H. lamp, horn, etc., in perfect running order, not used since 1918; £30.—Searle, Fruit Grower, Bluntisham, Hunts. [X7496]

Campion

LIGHTWEIGHT 2-speed Campion, in splendid order; £25, or exchange higher power.—A. Moyse, Kessingland. [7592]

1915 6-8 h.p. Campion-Jap, 3-speeded, clutch, sidecar, just overhauled and repainted like Sunbeam at cost £25, perfect; first £70 secures.—42, Hardy Rd., Blackheath, S.E. [7287]

Chater-Lea.

5 h.p. Twin Chater, 26x24 tyres, mag., King of Road lamp and generator, speed gear; £22, bargain.—E. Bros, 20, Blackfriars Rd., S.E.1. [7642]

CHATER-LEA, 3½ h.p., Bosch, B. and B., variable gear, lamps, tyres, and condition as new; £26.—After 6 o'clock—10, Woodwarde Rd., Dulwich Park S.E.22. [7166]

CHATER-LEA 6-8 h.p. Coachbuilt Combination, countershaft 3-speed; seen running; great bargain, £72.—Speechley, 1, Gunnersbury Lane, Acton, London. [7434]

Chater-Lea-Jap

4 h.p. Chater-Lea-Jap, Bosch mag., Amag, spring forks, very powerful and fast machine; £20, or exchange good lightweight.—Jeffery, Onchan, Isle of Man. [X7546]

3 h.p. Chater-Lea-Jap, 1914, Bosch, Binks, N.S.U., 32 speedometer, excellent condition; £37.—Brookfield Garage, Swan's Lane, Highgate. Hornsey 1657. [7637]

Chater-Lea-N.S.U.

CHATER-LEA, N.S.U. 3½ h.p. twin, Bosch, Senspray, 2-speed, free engine, tyres and belt as new; £18/10.—Chambers, Preston Bissett, Buckingham. [X7442]

Clyde.

CLYDE J.A.P. 5-6 h.p. Twin, Bosch, B. and B. carburettor, clutch, tyres good, ready to ride away; £25; stamp, photo.—64, Doncaster Rd., Leicester. [X7617]

Clyno.

CLYNO.—Earliest deliveries.—Your name on our list ensures this.—Martin Mit-hell, Ltd., Stafford. [7659]

CROW Bros, High St., Guildford, West Surrey agents for the 1919 Clyno. Order now to ensure early delivery. [1653]

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Ditto, 1913 exhaust	4/6
P. & M. pattern valves	3/9
Rudge 3½ and 5-6 h.p. valves	3/9
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MOTOR CYCLES FOR SALE.

Clyno.

GROVER, Smith and Willis, Basingstoke.—Agents for Clyno combination. Don't wait until the fine weather comes before placing your order. [6263]

CLYNO.—Sole Agents Cornwall and Devon (except small districts); sub-agents now being appointed.—Maudes, 100, Great Portland St., London, W.1. [6585]

CLYNO Combination, 1914, 6 h.p., interchangeable wheels, spare wheel, speedometer, hood, screen, horn, lamps, and spares; £60.—Baker, 86, Beulah Rd., Thornton Heath. [7550]

CLYNO Coachbuilt Combination, 1912, 6 h.p., 2-speed, kick start, all accessories, spares, etc., recently overhauled, new tyres, ready for road; £65-72, Hampstead Rd., N.W.1. [7542]

CLYNO Combination, late model, plating and enamel as new, 4 detachable wheels, perfect, only wants seeing; 100 gns., no offers.—Ward, Riverside, Lea Rd., Waltham Cross. Phone: 5. [7324]

CLYNO, 6 h.p. twin engine, 3-speed gear box, 1914 model, stored since the war, new tyres, detachable wheels, speedometer, horn, and tools, special coachbuilt sidcar, privately owned, in perfect condition; £105.—Brook, Burnham, Somerset. [6745]

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1917 2½ h.p. Consul-Villiers 2-stroke, single speed good order; first cheque £33-25, Colegate St., Norwich. [X7506]

Coventry Eagle.

COVENTRY Eagle 1919 2½ h.p., 2-speed, only ridden few miles; 55 gns.—Apply, 45, Friern Barnet Rd., New Southgate, N.11. [7472]

COVENTRY Eagle, 1918, 2½ h.p., 2 speeds, Klaxon horn, head light, etc., quite new; £45-53, Hawk's Rd., Kingston-on-Thames. [7626]

Diamond.

DIAMOND 2-stroke, 2½ h.p., good condition; £30.—Longman Bros., 2, King's Parade, Uxbridge Rd., Acton. Tel.: 1578 Chiswick. [7701]

Dot

DOT Combination, 9 h.p. J.A.P. engine, 3 speeds, real road racer, with sidcar; £85-23a, Bramber Rd., West Kensington, W.14. [7573]

Douglas.

DOUGLAS, 2½ h.p., 1915, 2-speed; £48-4, Station Buildings, Woodside, S.E.25. [7608]

DOUGLAS, 1914, 2½ h.p., 2-speed, perfect; 45 gns.—13, Freeland Rd., Ealing Common. [7569]

DOUGLAS, 4 h.p., Model B, 1919; price £85; never used.—The Rectory, Brimfield, Herefordshire. [X7192]

1911 Douglas, complete, less magneto, Palmer tyres, new tubes; £12.—Wiles, Dymchurch, Kent. [7410]

1913 Douglas, 2-speed, just overhauled, good condition; £30.—Blake, 86, Herbert Rd., Plumstead S.E.18. [X7056]

DOUGLAS 1914 T.T., lamps and horn, new Dunlop tyres; £45; evenings.—11, Gordon Rd., Finchley N.3. [7621]

1914 2½ h.p. Douglas, 2-speed, T.T., lamps, spare belt, fine order; £42.—Page and Girling, Melton, Suffolk. [7504]

DOUGLAS in Stock, 4 h.p. combination, £105; War Office 2½ h.p. model. £60; new.—Moat, Yeovil. Phone: 552. [7105]

GIBB, The Douglas Expert, Gloucester, is the man to get in touch with for best deliveries and advice. Phone: 852. [4749]

DOUGLAS, 2½ h.p., very good order, recently overhauled, believed 1911; offers.—Box L393, c/o The Motor Cycle. [7651]

DOUGLAS, 2½ h.p., 1915 Colonial model, in first-class condition; £45.—R. Alexander, Beacon Farm, Hungerford, Berks. [7258]

DOUGLAS, 2½ h.p., 2 speeds, Bosch mag., 1913, just overhauled; £34.—Watts, 15, Victoria Rd., Stechford, Birmingham. [X7572]

4 h.p. 1916½ Douglas, in perfect condition, lamps, speedometer, etc.; any trial; 76 gns. cash, 1, Church St., Kingston, S.W. [7571]

DOUGLAS, 2-speed, 1916 engine, very good condition; price £42.—Addess, Canty, Butcher, Crockenhill, Swanley, Kent. [7192]

2 h.p. Douglas 1914 Model W., 2-speed, kick starter 24 and clutch, new tyres, lamp set, and horn; £49-8, Waterloo Rd., Leyton, Essex. [7421]

DOUGLAS 4 h.p. Combination, Feb., 1919, run 300 miles, 3 lamps, speedometer, horn, etc.; for sale at cost £120.—Broad, High St., Esher. [7541]

DOUGLAS, 1915, 2-speed, W.D. model, £50; another, 1914, 2-speed, £45; both in good condition.—455, York Rd., Wandsworth. [7179]

DOUGLAS, 2½ h.p., 2-speed, kick start, splendid condition; £38; seen before 11.30 a.m. and after 6.30 p.m.—Herbert, 520, High Rd., Chiswick. [7321]

1914 2½ h.p. Douglas, 2 speeds, Bosch mag., lamps, horn, accessories, 1915 mudguards, carrier, just re-enamelled; bargain, £40.—Flowers' Garage, Harpenden. [X7382]

MOTOR CYCLES FOR SALE.

Douglas.

DOUGLAS 2½h.p., 2-speed, T.T., purchased 1915, exceptional condition, long exhaust, accessories: £52/10.—L. Disney, Kossie, Gloucester Rd., Kingston Hill, Surrey. [7464

1914 2½h.p. Douglas, Amac, Bosch, long exhaust, lighting set, brand new tyres, 2 kits, spare belt, beautiful tune; £46, no dealers.—Thomas, 32, Stockwell Green, Stockwell. [7164

ELI CLARK can give you good advice also good deliveries of 1919 Douglas motors. He will help you if possible with spare. The man on the spot.—196, Cheltenham Rd., Bristol. 'Phone: 4169. Wires Ignition, Bristol. (Please do not send sample spares. [0966

DOUGLAS 4h.p. and 2½h.p., brand new models, in stock. We are stockists and specialists of Douglas machines only, giving the finest service and the greatest choice of models in the South. Over nine years' experience as Douglas agents.—Thompson and Co., 408, Commercial Rd., Portsmouth. 'Phone: 7105. [2518

4h.p. Douglasses, brand new, fitted 3-speed gears, clutch, kick-start, with Douglas coachbuilt sidecar, £105; 3 lamp sets, horn, registration, writing number plates, £5/10 extra; specification with dates of delivery by post.—Douglas specialists, Robinson's Garage, Green St., Cambridge. Tel.: 388. T.A.: Bicycles. [7665

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Elswick.

ELSWICK, 2½h.p., less cylinder and piston, new tyres; £15.—V. Hinton, Woodham Mortimer, Meldon, Essex. [7238

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ENFIELD Combination, first-class throughout; any trial; £60.—31, Church St., Wolverton. [7581

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6h.p. Enfield Combination, excellent condition; £63.—Southbury House, Mytchett Rd., Frimley Green, Surrey. [7344

ENFIELD, 2½h.p. twin M.A.G. engine, 2-speed chain drive; £28/10.—9, Moorcroft St., Peckham, S.E.15. [7362

1916 Enfield Combination, 6h.p.: £85; no offers; reasonable trial.—Box L395, c/o The Motor Cycle. [7653

ENFIELD 3½p. Twin, 2-speed gear, good condition; any trial or examination; price £45.—Parker's, Bradshawgate, Bolton. [7225

ENFIELD Lightweight, free engine, 2 speeds, new tyres, lamp, horn, etc.; 40 gns.; after 5.—132, Holmleigh Rd., Stamford Hill. [7413

ENFIELD Combination, 6h.p., 1915, just overhauled handle start, in perfect running order; £75.—Burgess, Northdown, Wrotham. [7527

ENFIELD Military Combination, 1917, in good condition for Easter tour; £120.—L. Rogers, 106, Fulham Palace Rd., Hammersmith. [7517

ENFIELD Combination, 1916, 6h.p., perfect condition throughout, fully equipped, as good as new; 96 gns.—76, Haaden Rd., Lee, Kent. [7610

ROYAL Enfield 6h.p. Combination, lamp, speedometer, etc., any trial; £76, or offer.—C.S., 14, Swaton Rd., Campbell Rd., Bow, E.3. [7444

1916 6h.p. Enfield Combination, fitted with Lucas lamps, luggage grid, horn, etc., excellent running order; £95, or nearest offer.—Houle, Wilberforce, York. [7203

3h.p. Enfield, 1916, thoroughly overhauled and tested by makers last month, will take sidecar and starts first kick; £60.—30, Bleasheim Av., Ilford. [7175

1916 6h.p. Enfield Combination, as new, not done 3,000 miles, 3in. tyres; £110.—Apply, after 6 p.m., Fancourt, 4, Sussex St., Barking Rd., Plaistow. [7554

ENFIELD 6h.p. Coach Combination, speedometer, all accessories, luggage grid, in top hole condition; £78; owner bought car—244, Mount Pleasant Rd., Tottenham, London, N.17. [7323

6h.p. 1914 Enfield Combination, fitted with 3 lamps, generators, horn, speedometer, tools, etc., in excellent condition throughout; £78.—Scholes, "Burnside," Lightwood Rd., Buxton. [X7607

Excelsior.

5h.p. Single British Excelsior Combination for sale, head, screen, and lamps, all in new condition; £88.—Mottram, 77, Craven St., Coventry. [X7467

EXCELSIOR, 2-stroke, 2-speed, hand clutch, all-chain drive, lamp, etc.; any trial; £46, or offer.—C.S., 14, Swaton Rd., Campbell Rd., Bow, E.3. [7394

AMERICAN Excelsior 7-9h.p. Twin, and coachbuilt sidecar, 2-speed, clutch, kick start; £80.—Write appointment, Liddell, 62, Camden Rd., N.W. [X7552

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1913 F.N. Combination, good condition; £40.—Tucker, 30, Briton Rd., Faversham. [X7488

F.N., 2½h.p., 2 speeds, free engine, cardan drive, good order; any trial; £26/10.—17, Goldhawk Rd., Shepherd's Bush, London. [7409

F.N., 2½h.p., shaft drive, 2 speeds, clutch, fast and powerful, good condition, ready ride away; £20, close offer.—Fuller, Carter Rd., Horchurch. [7638

Harley-Davidson.

HARLEY-DAVIDSON Combination, as new; £97/10.—462, Lea Bridge Rd., Bakers Arms. [7709

1916 Harley-Davidson Combination, Swan torpedo, Bush. £120.—57, Lime Grove, Shepherd's Bush. [7488

HARLEY-DAVIDSON Combination, electric model, in good condition; £89.—5, Caoning Place, Deamark Hill, S.E. [7213

HARLEY-DAVIDSON 1915 7-9h.p. Combination, dynamo model, £115; good as new.—29, St. Leonard's St., Bromley-by-Bow. [7491

HAKI Harley-Davidson and Bramble Sidecar, mag. model, Nov., 1915, fully equipped, splendid condition; £110.—Bevir, Hurstdown, Hendon. [7282

HARLEY 7-9h.p. Combination, 3-speed, kick start, new 1916, perfect, £120; 1915 Douglas, 2-speed, £52/10, perfect.—5, Victoria Av., Surbiton. [7648

HARLEY-DAVIDSON, immediate delivery, latest 1919 models, 2 only, 1 electrically equipped and 1 magneto model.—Parker's, Bradshawgate, Bolton. [7219

HARLEY-DAVIDSON Combination, late 1917, electric model, complete; £140; hood and screen, luggage carrier, lovely condition.—Short, 485, Upper Richmond Rd., East Sheen, S.W. [7495

HARLEY-DAVIDSON Combination, 1917 (late), mag. model, fully equipped, perfect condition; £138; would exchange for late Rover, Sunbeam, or Triumph with cash.—40, Golders Manor Drive, Golders Green. [7301

HARLEY-DAVIDSON Combination, late 1915, with 1916 improvements, 7-9h.p., electric model, Gloria sidecar, hood, screen, 3,000 miles, electric horn, lamps, etc., thoroughly overhauled by H.D. Co. in autumn, 1917, hardly ridden since, in beautiful running condition; £85, no offers.—Brynawel, Cwmshpant, Llan-y-bryher, Carmarthen. [X7347

1917 7-9h.p. Harley-Davidson Combination, magneto, in excellent condition throughout, tyres and chains almost new, spare cover half worn, screen, 3 lamps, D.A. cylinder, and ordinary generator, strong, spares, tools, insured; trial by appointment; owner ordered abroad; £140.—Capt. Hay, Varley, Bromley, Kent. Tel.: Bromley 1482. [X6307

Hazlewood

HAZLEWOOD Motor Cycle Combination, 5-6h.p. J.A.P. engine, coachbuilt sidecar, good order; £110, or near offer.—Crows' Garage, Willesden Lane, N.W. [7376

1914 Hazlewood-Jap, 5-6h.p., countershaft, clutch, kick starter, Phoenix torpedo coachbuilt, all accessories, can drive away; £75.—Weller, 507, Hornsey Rd., N.19. [7329

Henderson.

4-CYL. Henderson Motor Cycle, new 1914, been stored 3 years; £65 carriage paid, no offers, worth £80.—Box L379, c/o The Motor Cycle. [7379

HENDERSON, 1915, 10h.p., 4-cyl., 2-speed, new Dunlop studded 28x3in. tyres, splendid condition, £90; Ivy sidecar to suit, hood, new tyre, £7.—156, Browning Rd., East Ham, after 6 p.m. [7298

1914 Henderson Combination, stored 3 years' original tyres, engine as new, very powerful and economical mount, guaranteed; private owner; £95, or £70 solo.—F. Deveraux, Bellvue Villas, Shillington, Hitchin. [7296

Hobart.

HOBART 1915 2½h.p. 2-speed Sporting Combination, Watsonian coachbuilt sidecar, disc wheel, lamps, horn complete; bargain, £50.—E. Woods, 312, Deansgate, Manchester. [X7393

Humber

HUMBER, new 3½h.p., 1917, flat twin model, unused; in stock.—Moss, Wem. [X7473

HUMBER, 3½h.p., mag., Mabon clutch, new tyres, excellent condition; £15.—16, Belmont Rd., Mordenhead. [74619

HUMBER Lightweight, 2h.p., spring forks, mag.; £16.—Halifax Motor Exchange, Union St. South. Halifax. [7306

31h.p. Humber, 1914, 3 speeds, very low mileage, perfect condition, Montgomery sidecar; £55.—Oliver, Sandlands, Walton-on-the-Hill, Tadworth. [7370

HUMBER Lightweight, engine and condition splendid, tyres and belt new, ride away; £22; after 6 and week-ends.—Kenwood Stables, Gower Rd., Weybridge. [X7438

MOTOR CYCLES FOR SALE.

Humber.

HUMBER, 3½ h.p., 2-speed, free engine, handle start, Bosch mag., new tyre foot, new rear wheel, been stored; £18.—Bailey, Sandwich Rd., Exthorpe, Dover. [X7573]

HUMBER, 4 h.p., 2-speed, clutch, handle starter, Amac, new belt, Millport coachbuilt sidecar, all lamps, perfect condition; £55.—63, Solon Rd., Brixton. [7694]

3½ h.p. Humber Combination, 2-speed, handle start, 32 wants new tyre, engine just overhauled, owner bought car; first £30 secures.—Lines, 102, Midland Rd., Wellingborough. [7202]

LATE 1913 3½ h.p. Humber, 2 speeds, clutch, handle start, lamps, horn, good tyres and condition; £35.—Cromhill, Myrtle Villa, Shoulder of Mutton Green, Welling, Kent. [7487]

HUMBER, latest model 3½ h.p. opposed twin, 3-speed, handle starting, clutch, Lucas lamp set and horn, had 3 weeks' use only; £80.—Barnet and Whetstone Garages, Ltd., 202-4, High St., Barnet, Herts. [7617]

HUMBER, 3½ h.p., 1913, 3 speeds, free engine, good tyres and tubes, new belt, good plating and enamel-lug, in thorough good condition, never had sidecar on it, not been ridden for 4 years; any trial gives Saturdays or weekdays; £32.—Tom Batt, Tordone Farm, Bethereden, Ashford, Kent. [X7426]

Indian.

1915 Indian Combination, good condition, 3 speeds. —Jeweller, 13, New St., Wellington, Salop. [X7576]

INDIAN, 1916, 7-9 h.p., electric lighting, exceptionally fast, not used 2 years; £82.—104, White-chapel Rd., E.1. [7579]

INDIAN, 7-9 h.p., 2-speed, clutch model, good condition; £55; after 6 p.m.—30, Hartfield Crescent, Wimbleton, S.W. [7575]

INDIAN, 7-9 h.p., 2 speeds, 1914 model, just renovated; £55.—H. Pilford, Richmond House, Odel St., Albany Rd., S.E. [7177]

5-6 h.p. Indian, clutch model, less mag.; exchange 3 h.p. Eofield or Douglas; sell 30 gns.; after 6 p.m.—14, Cowper Rd., Acton, W.3. [7510]

INDIAN, 5-6 h.p., T.T., solo, good condition, fast, new tyres, 2 new spares; £37; viewed Saturday afternoon.—247, High Rd., Lea. [X7608]

LIVERPOOL and District Agents for Indian. Place orders now to secure early delivery.—Victor Horsman, Ltd., 9, Parr St., Liverpool. [10002]

INDIAN, 7-9 h.p., 2-speed, 1914, coachbuilt sidecar, new Dunlop tyres, in good condition; £70.—L. Freeman, Poulis, Bookham, Surrey. [X7584]

INDIAN, 7-9 h.p., T.T., clutch model, electric lamps, separate dynamo, horn, speedometer; £60.—Loweth, 6, Mount Pleasant Rd., Ealing. [7453]

1914 7-9 h.p. Indian, clutch model, just overhauled, in fine condition; £50, no offers.—Between 9 a.m. and 6 p.m., 6, Percival St., Clerkenwell, E.C. [7599]

INDIAN Combination, 2-speed, clutch, coachbuilt sidecar, speedometer, 2 lamps, horn, beautiful turnout; £78, bargain.—411, City Rd., Angel, Islington (over shop). [7257]

INDIAN, 7-9 h.p., Powerplus, almost new, and new £40 all-steel sidecar, complete lamps, horn, speedometer, etc.; any trial London.—Box L369, c/o The Motor Cycle. [7277]

INDIAN, 5-6 h.p., 1915, clutch, ready to drive from London to Scotland, topping condition; £60; no dealers; appointment.—Derwent, Clarence Rd., Clapham Park, London. [7589]

1916 Indian Combination, 5-6 h.p., 3-speed, kick starter, lamps and horn, sporting torpedo sidecar, top hole condition; 70 gns., no offers.—Buckman, 31, Bayley Lane, Coventry. [X7662]

LATE 1914 2-speed 7-9 h.p. Indian Combination, kick starter, clutch, electric light, not ridden for 20 months, just partly overhauled, fast, splendid climber; what offers?—Casson, Seacombe, Chard. [7185]

INDIAN Combination, Gloria, 2-speed, 1914, wonderful condition, just thoroughly overhauled, electric lamps, horn, tyres new, speedometer, T.T. machine part; sell, £65.—Cpl. Biss, Royal Air Force, Dundee. [7328]

INDIAN Combination, 1914 7-9 h.p., clutch model, Palmer cords, mechanically perfect, red finish, and new condition, light sporty underslung sidecar, stored 3½ years; £65.—Write, Martin, 8, Greaville St., W.C. [X7585]

7-9 h.p. Indian Combination, with screen, 1915, electric lighting, electric horn, speedometer, clutch, 3-speed model, recently overhauled, in perfect running order; price £95.—Hickman, The Ghyll, Crowborough, Sussex. [X7434]

POWERPLUS Indian, 1916 Model F, dual clutch control, electrically equipped, Splitdori dynamo mag., latest transparent accumulator, easy starter (electric switch), extra hand air lever for carburettor, with Mills-Fulford Model de Laxe sidecar, coachbuilt, heavily padded; £115 cash; ready to ride away.—Rev. T. E. McCorkick, Kingsdon Rectory, Taunton. [7262]

Invicta.

INVICTA, Villiers 2½ h.p. 2-stroke, new engine parts and Dunlop on back, perfect condition; what offers?—Thompson, 40a, Underhill St., Bridgworth. [7547]

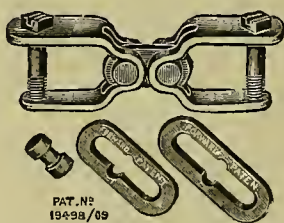


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Ivy.

1916 Ivy, 2-stroke, complete with lamp set, etc.; £30.—2nd-Lt. Armstrong, 20th Tank Battalion, Bovington Camp, Woot. [7635]

1914 4½ h.p. Ivy Combination, 3-speed, clutch, fully equipped, little used; £50.—Edna Villa, 81, Andrew's Rd., Cambridge. [7556]

IVY Motor Cycles.—For immediate delivery of these famous 2-stroke machines, try The Walsall Garage, Wolverhampton St., Walsall. Phone: 444. London Depot: H. G. Henly and Co., 91, Gt. Portland St., W.1. Phone: 4084 Mayfair. [4672]

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IXION 2-stroke, 2-speed, lamps, excellent condition; £34.—Poole, Ashdown, Wellington, Salop. [7241]

IXION, 1914, Villiers engine, 2½ h.p., 2-stroke, engine as new, just overhauled by makers, perfect condition, Lucas lamp set; £30.—Joyce, 16, Colony Cottages, Foleshill. [X7538]

FOR Sale, 1915 2½ h.p. Ixion-Villiers 2-stroke, only done 1,000 miles, Amac, e.i.c., new tyres, horn, absolutely tip-top condition, photograph if desired; £30 or nearest.—Write or call any time, Lt. Longstaff, Officers' Mess, Lulworth Camp, Dorset. [7477]

James.

JAMES Combinations.—District agents, Hilton, Sharp and Co., Ltd., Foxhall Rd., Blackpool. [X7106]

JAMES Motor Cycles.—Prompt delivery all models; trials arranged.—J. C. Phipp, Sherston, Wilts. [7067]

FOR Sale, James 2½ h.p. 2-stroke, indistinguishable from new; £45.—J. Bearin, Miswell Lane, Tring, Herts. [7486]

JAMES.—Sole agents for Hertfordshire, 1919 machines in stock.—Chandler, Reyre and Williams, Sun St., Hitchin. [0997]

JAMES 4½ h.p. Combination, 3 speeds, countershaft, clutch, kick starter, chain drive; £85.—211, Garratt Lane, Wandsworth. [7645]

JAMES.—Immediate delivery of all models.—Sole district agents, The Walsall Garage, Wolverhampton St., Walsall. Phone: 444. [4671]

JAMES and Sidecar, 3-speed Sturmer-Archer, clutch, Bosch mag., with sidecar, ready to ride away, speedometer; £45.—108, Glenparke Rd., Forest Gate. [7467]

W. WHITBY and Son, sole agents for Acton and Ealing districts for James motor cycles.—Deliveries now taking place.—7, The Vale, Acton, W.3. [X7564]

4½ h.p. James Combination, 1916, 3-speed, clutch, kick start, thoroughly overhauled, excellent running order, as new; must sell, £75.—Snellgrove, 36, Egbert Rd., Wichester. [X7462]

JAMES 3½ h.p. Twin, 3-speed countershaft, clutch, kick start, Miller lamps, new chains, extra sprocket, valves, etc.; £38, bargain; seen after 6.—50, Cecil Av., Eofield, Middlesex. [7460]

J.A.P.

8 h.p. Jap-Paragon, 3-speed, kick start, coachbuilt sidecar, speedometer, Kixon horn, etc.; £68.—East View, Chase Court Gardens, Enfield. [7458]

J.A.P., 4 h.p., 1914, 3-speed, clutch, underslung coachbuilt sidecar, good condition; £47/10.—201, Durants Rd., Ponders End, Middlesex. (D) [7240]

4 or 6 h.p. J.A.P. and Sidecar, mag., free engine, clutch, 2-speed, chain drive, in good order; £25.—Young, 41, Shepperton Rd., New North Rd., Islington. [7528]

Kerry

1914 Kerry-Ahingdon, 3½ h.p., 2-speed, clutch, lamps, suitable sidecar; £30.—46, Aldborough Rd., Ilford. [X7594]

Lea-Francis.

LEA-FRANCIS, late 1913, 3½ h.p. J.A.P. engine, 2 speeds, clutch, chain drive, new Palmer cord tyres, lamps, horn, tools, etc.; £50.—The Barnet and Whetstone Garages, Ltd., 202-4, High St., Barnet, Herts. [7618]

LEA-FRANCIS, 3½ h.p. twin J.A.P., 3-speed countershaft, kick start, with Montgomery sidecar, good tyres, speedometer, horn, sidecar enamelled heliotrope, tank panelled to match, disc wheels; £70.—Frampton, Terrace Walk, Bath. [X7659]

Levis.

LEVIS, new 2½ h.p., 1917, Model E, 2-speed, and free engine.—Moss, Wem. [X7474]

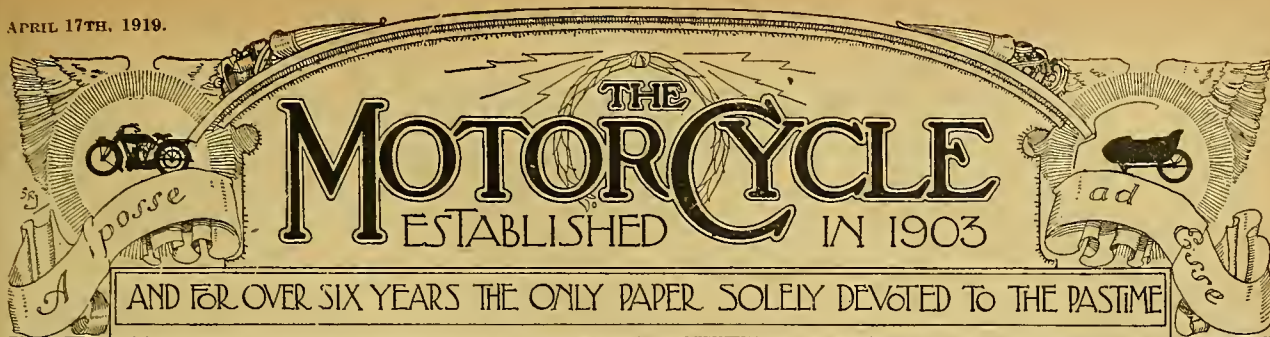
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LEVIS Baby, 2½ h.p., 2-stroke, 1916-17, Dixie, B. and B.; £30.—Railway Garage, Staines. Phone: 139. [7530]

1916 Levis Popular, very good condition; price £28.—Address, Canty, Butcher, Crockenhill, Swanley, Kent. [7191]



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Easter, 1919.

THIS is the season when all keen motor cyclists attend well-known rendezvous, and find great interest in examining the new machines of their fellow enthusiasts. Before the war Easter could be regarded as a time when most of the new models would be in the hands of the public, but this year, we are afraid, very few new designs will be found at such meeting places on the road. The few entirely new designs produced since the Armistice are rare, and new machines are confined to those makes in which pre-war design predominate.

However, there will be no lack of interest among motor cyclists, and no doubt every new looking machine will be keenly scanned for new fittings and improved details, while makers' samples not yet in the public's hands will be watched for near every centre where motor cycles are made. This Easter also opens the post-war competitions, and it is anticipated that quite a number of riders will congregate at various points on the courses where the trials are being held.

The State of the Roads.

AS touring by motor cycle is likely to begin again in earnest at Easter, a few words as to the state of the roads may be of use to those who propose to go into districts with which they are not fully acquainted. We have from week to week been publishing information as to the present state of the roads of Great Britain, many of which have been rendered more or less impassable by the war traffic. Shortly, it will be best to avoid those districts where large camps or aerodromes have been situated, and generally those in which much munition work has taken place. Thus, in the Salisbury and Blandford districts the roads will be found to be in very poor condition. The county of Kent, too, has suffered in spite of the pre-war excellence of its roads. The coast road from Sandwich, through Deal to Dover, to

Folkestone and thence inland more than half the way to Canterbury, is in a very bad state, as are also the road from New Romney to Ashford and the first half of that between Canterbury and Margate.

In the London district many of the main roads leading into different parts of the country are much cut up; the roads through Watford, Uxbridge, Ascot, Dartford, Bromley-Westernham, and Warrington being notable examples. Other roads in this district which should be avoided are those from Guildford to Ash, Reading to Riseley, and Wokingham through Arborfield Cross to Eversley.

Oxfordshire abounds in bad roads at the present time, especially in the neighbourhood of the university city and from Faringdon to Wantage. Herefordshire has suffered much from the haulage of timber and other heavy traffic. Riders bound for West Cornwall are, after leaving Launceston, advised to make their way through Camelford and Wadebridge instead of over Bodmin Moors. On the South Coast a bad stretch will be found between Lewes and Eastbourne. The Welsh coast, too, has suffered.

The Mudguarding Problem.

WHEN the middle of April is reached, the question of mudguarding as a rule is laid for a while upon the shelf, but as we write, the weather is like November rather than spring, and we publish in our Correspondence columns a further appeal to manufacturers to give more attention to this important subject. We wish to second this appeal to the best of our ability, therefore we make no apology for referring time after time to this question. Mud is thrown up by the front wheel, and, before it can fall to the ground, the motor cycle overtakes it and, consequently, both machine and rider become very dirty unless means are taken to intercept the mud. Surely, the brains devoted to motor cycle design can provide something efficient and not unsightly.

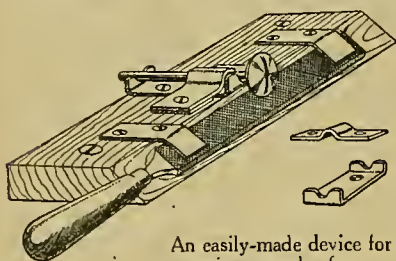
IDEAS: Useful and Ingenious.

Sydney R. Jones



A Valve-grinding Device.

MR. J. F. T. CRIDLAND, a Forest Hill reader, sends us a sketch of an accessory he has made and found useful in regrinding and truing up the valves of a 2½ h.p. Douglas, but which can be adapted for any valve. As will

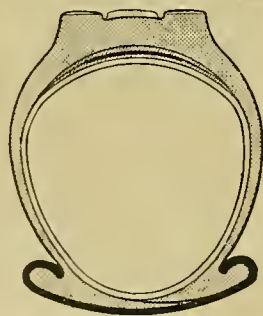


An easily-made device for truing up valve faces.

be seen from the drawing, the base of the device is a 1in. board, 8in. x 4in., bevelled on one side to 45°. Two clips for the file are secured to the top surface, and are made of ¼in. steel ¾in. wide, and a clamp and V bearing for the valve are constructed of sheet steel 1in. wide and ¼in. and ½in. thick respectively. The file used is a 6in. dead smooth, and the valve face is rotated against it by means of a brace or a screwdriver.

A Puncture-proof Tyre.

NECESSITY is truly the mother of invention, and the patented puncture-preventer illustrated below is no exception to the rule. Mr. W. A. Rothwell, the patentee, had great trouble



A puncture-preventing device.

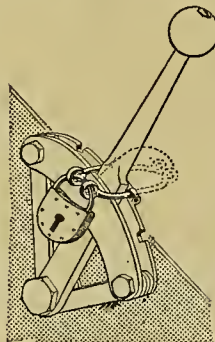
with the tyres on his 2½ h.p. twin Enfield during duties at aeroplane factories, where nails and such things, so detrimental to tyres, are lying about in abundance. The idea occurred to Mr. Rothwell to utilise a length of thin spring steel, similar to that used as springs for gramophones and clocks, which he securely stitched between two lengths of stout canvas. This band was then placed

Readers of "The Motor Cycle" are invited to contribute to this page any ideas successfully adapted to their motor cycles. Contributions will be paid for at our usual rates. Rough sketches will suffice

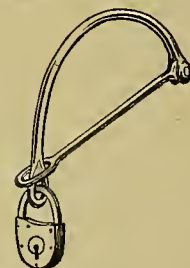
between the cover and the tube, and after 3,000 miles he tells us that he found no retarding effects, and had no punctures. He has, therefore, protected the idea, with a view to marketing bands suitable for all sizes of pneumatic tyres.

A Locking Device.

IN view of the numerous thefts of motor cycles, the locking device illustrated may be of some value to motor cyclists who have frequently to leave their machines unattended. A hinge on which a padlock can be



Fastening the gear lever into neutral position.



A stirrup locking device.

locked holds securely the change-speed lever in neutral position.

Another device that has been found serviceable is the use of a stirrup similar to those used in the Army to lock kitbags.

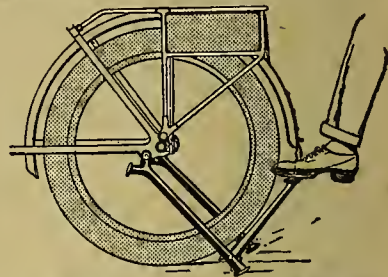
Easily-operated Rear Stand.

THE stand illustrated herewith has been protected by Mr. A. S. Bryer, of Southampton, and has for its object the elimination of strain on the part of the motor cyclist in raising his machine on to the stand.

Mr. Bryer's stand has two legs and a connecting bar of the usual type, and around the latter rotates a sleeve, to one end of which is fixed a foot lever.

The lever lies parallel and close to the inner face of the leg when not in use, and the end has two laterally projecting lugs, extending one each side of the leg. Similar lugs are also fitted at the other end of the sleeve.

When it is desired to "raise" the machine on its stand, the pedal lever is moved outward until the lugs at each end of the sleeve engage the legs. The pedal lever is now at an angle of approximately 80° to the leg.



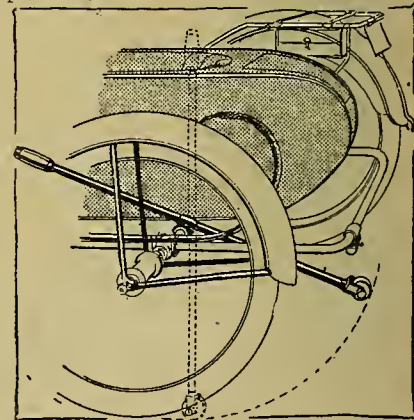
Moderate pressure of the foot is sufficient to raise the rear of the machine

The rider holds the saddle or carrier of the cycle, and by pressing upon the pedal the machine is raised until the stand assumes its supporting position. On the rider withdrawing his foot, the lever returns, by the aid of a spring, to its normal position.

Jacking the Sidecar.

THE provision of a sidecar jack or stand is claiming the attention of some makers, but the majority still allow the raising of the cycle on its stand to throw the sidecar over at an angle, thus setting up unnecessary strain at the lugs.

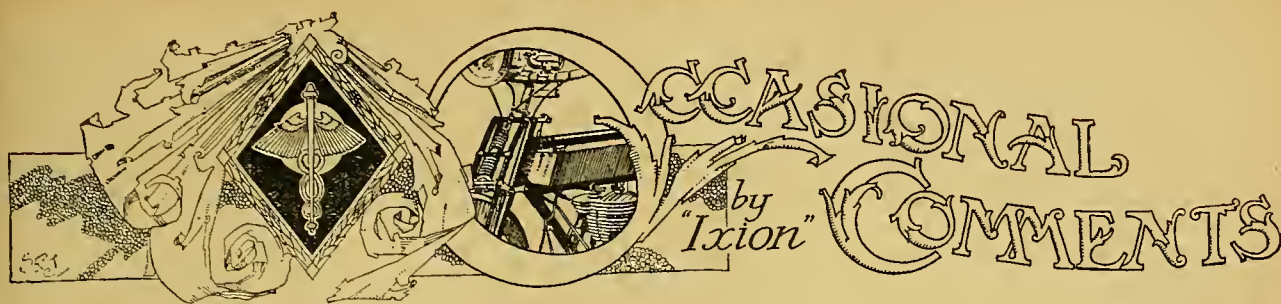
The following suggestion would facilitate the raising of the sidecar without undue exertion. A straight tube may be pivoted to the axle between the spring and the wheel, or in any other convenient position; the rear end should have a



A suggested sidecar stand.

roller or wheel, and the operating end could be finished with a handle-bar grip.

The only movement necessary to lift the sidecar is the pulling up of the lever to a vertical position.—F.A.S.



Honour to Whom Honour.

WHILE everybody is talking big about "mass production" and the "lessons of aero engine practice," I think we are in some danger of forgetting two firms to whom the industry owes a debt which is unforgettable. I refer primarily to the Triumph Co., who in my opinion rescued motor cycling from a slump due to bad design, which threatened to engulf it a few years ago; and, secondly, to the Douglas Co., whose perseverance made the flat twin a practicable machine. I am old enough to remember how two separate firms tried to make a job of the flat twin, and after struggling along in obscurity for a season or two surrendered. Then the Douglas people, who were then best known as makers of shoe trade machinery, took up the old Barter and Fairy patents on sound engineering lines and with the essential capital, with the result that the flat twin now challenges the once monarchic single. Probably this paragraph of mine is quite unnecessary. Both of these firms are slow of speech. They are more prone to perform than to promise. Neither of them has yet whispered to the public of anything but W.D. models. I expect each factory has a rod in pickle for those audacious mushroom firms which are plunging into mass production. Personally, I hope to welcome something of real interest from both concerns.

Dirty Wheels.

IF flesh could crystallise (pardon "fatigue") as metal does from over-exertion, many motor cyclists' tongues would long since have dropped off as the result of denouncing the 1914 machine for its dirt-collecting propensities. It is odd that, though we hear so much about mud traps on the crank case, rust traps on the handle-bar, oil and dust traps on the tank top, police traps on the road, so few people ever mention the propensity of wire wheels for catching and holding dirt, or the difficulty of cleaning these parts. I suppose we are sunk in a sullen despair, knowing that windage practically puts the disc wheel out of court for serious riding. I should be very sorry to say good-bye to the wire wheel for some reasons; it is the only part of the average machine which has a delicate and fairy appearance: and a speedster should not look too lumpish. The wire wheel is elastic to a certain degree, and so makes for comfort: it is cheap to make, and easy to repair, unless, of course, you throw it under a traction engine, or bend it into a true lover's knot by ramming walls with it. But it is a beast to clean. Do not mistake me. I never clean my machines. I coat them with vaseline on delivery, and when selling day comes, one good wipe over brings away the vaseline plus the filth of ten thousand miles. But saner owners, I am credibly

informed, spend an hour each evening going over their 'buses with metal polish. Moreover, the general public considers motor cycling a filthy pastime, and countenances speed limits and police traps because it sees us careering about with mud on our spokes, which is far worse than a Bacchante with vine leaves in her hair. So—strictly *pro bono publico*—I plead for a pressed metal artillery wheel, which shall be light, strong, resilient, and easily cleaned. In Mr. Sankey's ear I breathe interrogatively the one word—"Duralumin"?

The New and the Old.

AS one of the very few riders who have sampled both the old 1914 A.B.C. (500 c.c.) and the new 1919 400 c.c. pattern, I am glad to give my testimony that the new-comer will do practically everything that its papa was capable of. With the possible exception of the four-cylinder Henderson, I do not expect to taste better acceleration than the 1914 model gave on second gear uphill: but the 1919 model has a better jump on the higher gears. The steering of the little one is perceptibly the better of the two; but I still have a weak corner in my heart for the springing of the old 'nn.

"Lightweight" Bicycles.

WE have frequently wandered into confusion in respect of lightweights. I have often suggested that the term "light" in reference to a car does not necessarily convey any particular information about its weight (or, for the matter of that, its price, as was once implied); a light car in 1918 meant a car with a smallish engine: by 1920 it may only mean a car that has a smaller engine than your pre-war car, which may have been of 40 b.h.p. So too in motor cycles. At one time a "lightweight" motor cycle was a machine which was catalogued at or near 100 lb. To-day it means a cycle which has an engine of less than 400 c.c. but which may tip the scale at 2½ cwt. This is simply ridiculous. In the so-called light car world, the real objective of classification is initial cost and running cost. Whatever term is used for the "juniors" and the "junissimuses" (I am an old man and have forgotten my Latin) should guarantee that the car so christened is cheapish to buy and very cheap to run. In the sphere of lightweight motor bicycles, price is not the main objective. If some stout old party who has not viewed his toe-caps for years hears a cycle described as a lightweight, it is weight which is his primary interest. He wants to be sure that he will not have an apoplectic stroke when he has to hoike the carrier backwards to get the machine on its stand. He may have no ambition to carry it up steps, but at least he will be depressed if it pushes

Occasional Comments,—

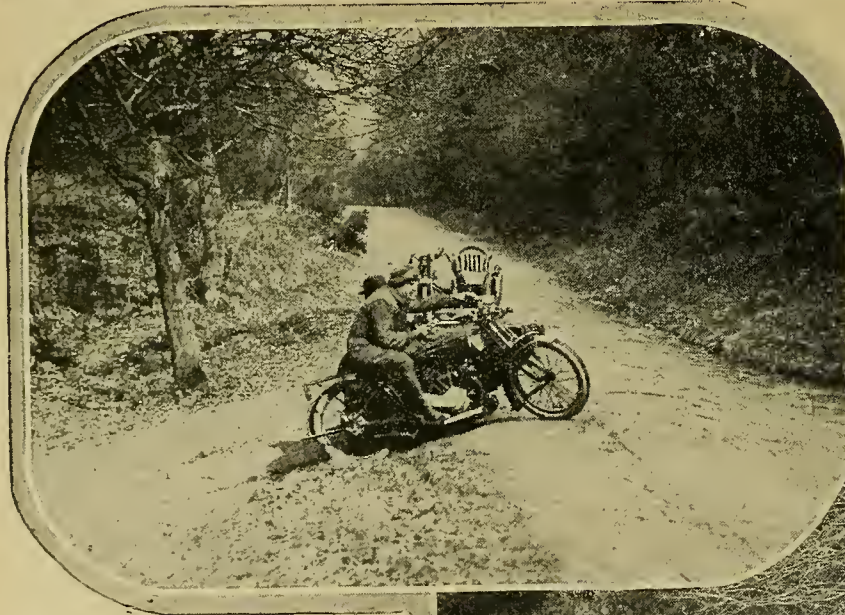
him over on his back when he rashly lets it lean against him. At present, press, trade, clubs, and enthusiastic conversationalists befog this sporting old party quite hopelessly. For when Jones brags that his "lightweight" can be kept on the mantelpiece, he is talking of a Levis Popular, weight 110 lb.: and when Brown talks of "lightweight," he is describing deeds of derring-do on a 1920 'bus with spring frame, lighting dynamo, and Zeppelin-aluminium-girder sidecar, weight 5 cwt. all on. I am not so crazy as to suggest that low weight is the Alpha and Omega of a "lightweight." Comfort, hill-climbing, reliability, and cost are all factors in the demand. But the term is grossly misapplied at the present time; and when so many slim girls and impoverished elderly papas with equators are nibbling at our hobby, it is time we became more precise in our diction.

The Cheapest Sidecar Outfit.

ONE or two correspondents have written to ask me what is the cheapest bargain in the way of a sidecar outfit during the present epidemic of famine prices. The answer must vary with three factors, viz., the exact sum available, the nature of the local hills, and the degree of luck encountered in spotting what one is seeking. Broadly speaking, a

fair fun is obtainable. Next to the twin I should place the chain-driven single-cylinder, which is also rather a rarity at a low price: three-speed belt-drivers with hub gears are neither very scarce nor very dear, but if a skilled overhaul of the hub can be managed, the ensuing season should be free from transmission troubles of a serious character, unless bad hills and bad weather are met in combination. It is better to be lucky than rich, and some persevering buyers with shallow purses are unearthing sellers who are not profiteers. Really, the whole question turns on whether the would-be buyer is ready to put his pride in his pocket. Until recent years even the knut had to tour either with a three-speed hub and belt drive, which gave trouble at regular intervals, or with a single-gear belt. We were not particular. We wanted to take our girls about with us, and we took them. What matter if wisdom bade us dodge certain hills at any time—rush another up to the sticking point with passenger, descend, and rush to where the passenger had tramped and was ready to help in the push—always feel if the belt punch and knife were in our pockets—and so on? We thoroughly enjoyed these quaint, primitive, strenuous tours. If the money does not run to a slap-up £130 6 h.p. combination with dynamo and three speeds, why not take the best you can afford and use it? I'll be bound

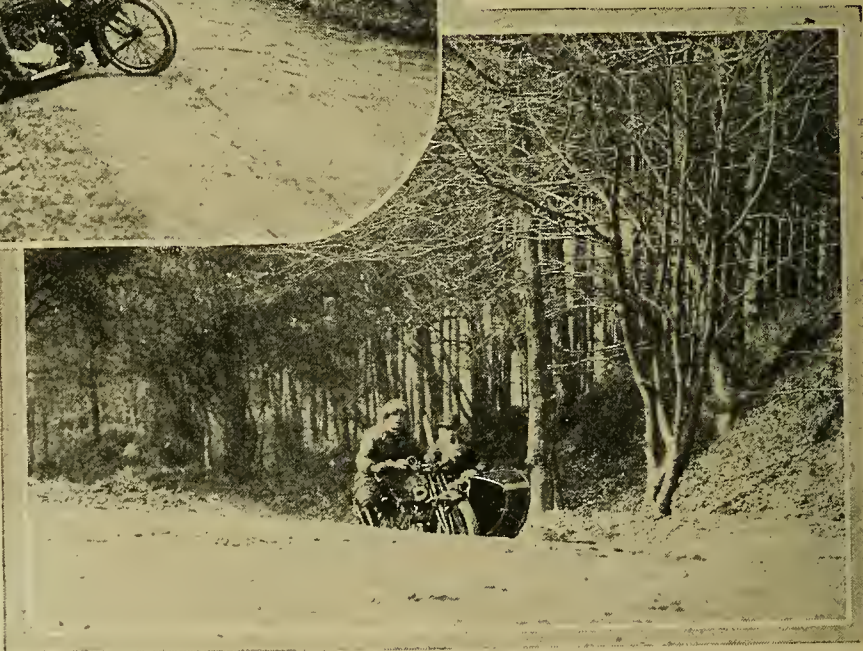
this coming summer will resurrect a lot of old corks, and that their users will enjoy the fun of tuning them up and coaxing them to achieve miracles. One of the merriest souls I know used to drive a high compression T.T. 6 h.p. twin, single gear, belt drive, and sidecar. He was not blessed with a stout wife, and they did not take evening dress with them, but they had some exceedingly good times together.



TESTING THE 8 H.P. BLACKBURNE

Negotiating sharp and steep turnings into the Churt road. (See page 381.)

low-gear gear-boxless twin is the best bargain in this line for a poor man; if the average pace is kept down, a big twin will stand quite a low gear, and if opened up from cool will do some wonderful climbing on a single gear. A chain-driven is preferable in view of wet weather, but if two belts, as wide as the pulleys can take them, are carried, very



A Road Test of the New 8 H.P. Blackburne



A Strenuous Test in the Hindhead District.

ONE day last week, on a very faint line, Mr. J. S. Holroyd was heard to inform us that the new 1919 8 h.p. Blackburne sidecar combination was ready for the road, and, beyond hearing something to the effect that he would like us to come and see him try to break it up, little more could be heard. We arrived by road the next morning, and found the new Blackburne quite ready for the trip. The outfit had only just been completed, and all it had had in the way of a test was a run to Gosport and back to Tongham. So far as the motor bicycle is concerned, it is similar in many details to the 4 h.p. we recently described, except that the engine is a 60° 85 mm. x 88 mm. 998 c.c. twin, with detachable and interchangeable cylinder heads, and that most noteworthy of all Blackburne features—an outside flywheel.

Particular attention has been paid to the silencing of the engine, both as regards the exhaust and also as regards noises from the valves and timing gear, and considerable success has been attained in this direction.

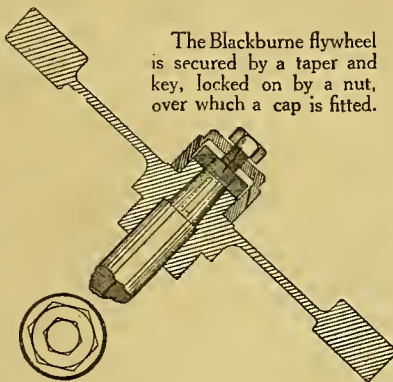
We left the works in the luxurious sidecar with the designer at the helm, followed by another Blackburne driven by one of the directors, Mr. Cole, while *The Motor Cycle* photographer brought up the rear on his Matchless, with Mr. Reeves, another director, as his passenger. From Tongham we made our way along bumpy roads, which brought us eventually to Elstead. From here we proceeded in the direction of Churt until we reached a pretty spot where a steep, rough, and narrow track, obviously not meant for wheeled traffic, descended into the valley. Here we made a brief halt to take photographs, and then the day's work really began. It is not our usual custom to go out on a trial run and leave the manufacturer or his

representative to choose the course, but on this occasion the matter was taken out of our hands, and no one except our pilot knew whither we were bound. In a few minutes we were in a part of Surrey the nature of which could never be guessed: a wild district of unsurpassable beauty, unsullied by signs of human habitation, and devoid of all roads. True, there were tracks, and these were similar to the mule paths that exist in the Vosges and other mountainous districts. Our descent was down one of these steep tracks. The surface was sandy and intersected by ruts, gulleys, roots of trees, and great stones, the avoiding of which (when possible) called for every atom of skill the driver possessed. Such surfaces excited rebellion in the hearts of certain competitors in the 1914 Six Days

Trials, yet they are of a kind met with in our Overseas Dominions, and it is for these countries that so many British motor cycles are required. Messrs. Burney and Blackburne realise this, and their products have the high ground clearance, the 28 in. wheels, and the power to combat these conditions. The top gear ratio, we may mention, was $4\frac{1}{4}$ to 1.

When once the stretch of wild country was entered we stopped, and it was decided to make a round of the course first so that we might choose the spots where the best views might be taken, but the photographer misunderstood instructions and dashed on

ahead, much to Mr. Holroyd's consternation, as the road was really dangerous, but he stuck in the sand at the critical point and had to come back. It now came the turn of the new Blackburne, and we charged up the hill over a surface similar to that described above on to a gradient of about 1 in 5. Just short of the summit the combination almost came to a standstill owing to back wheel slip, but heeling over to a dangerously



The Blackburne flywheel is secured by a taper and key, locked on by a nut, over which a cap is fitted.

A Road Test of the New 8 h.p. Blackburne.—

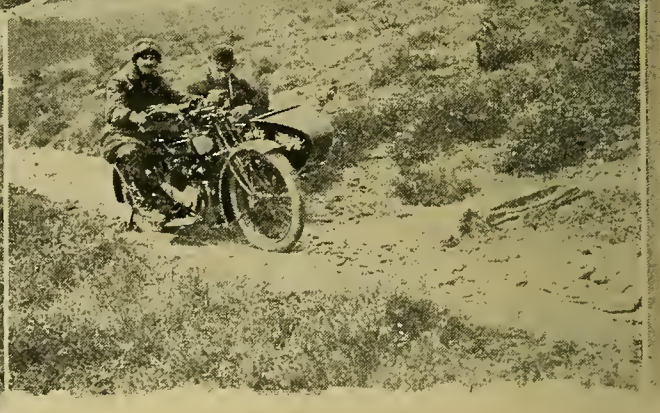
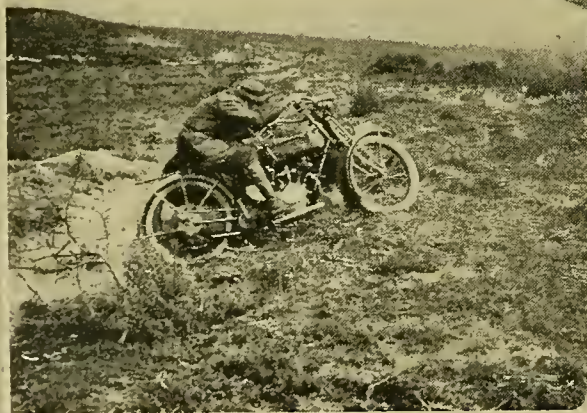
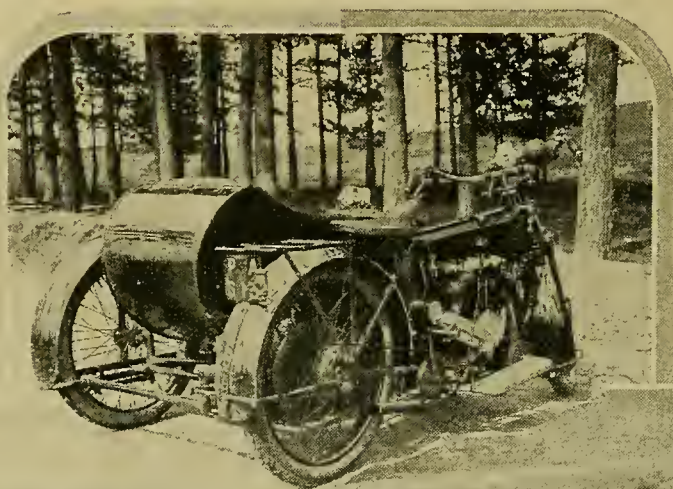
steep angle, so abruptly did the track slope away, and with a veritable precipice on the left, the engine gallantly stuck to its work and surmounted the gradient. The track now became less steep, but no better as regards surface; notwithstanding, Holroyd changed into second, climbed a short steep pitch, and then, to our amazement, left the track, slewed round to the right, and charged up the hill over the gorse.

As we anticipated it would, the engine resented this treatment and stopped, but Holroyd was much surprised till he discovered he *had omitted to change down to first speed*. This was a fault which was soon remedied, and we were again tackling the slope. A glorious view unfolded itself, but for the moment we were occupied in regarding the hollows, bumps, and ridges which were wringing and straining the sidecar frame, but nothing happened. The Blackburne did all that it was asked to do, and did it well, and part of it over a track which no car, not even a Ford, could have negotiated owing to its narrowness. Most of the course was done again, and done even better for the benefit of the photographer, and then the real test finished up with a genuine "freak" hill-

climb. The surface was as before, the gradient 1 in 4 or worse; the power was there but adhesion failed, and a boulder blocked the way, so what would you?

It was a wonderful performance over a course of Mr. Holroyd's own choosing, and not one we should have selected ourselves. Resuming normal conditions we took the helm and returned to Tongham through Tilford and across the Hog's Back. This gave us the opportunity of appreciating the new Blackburne's good qualities to the full. We found the engine to be beautifully balanced, and its smooth and silent running appealed to us most strongly. The engine possesses wonderful powers of picking up speed on a gradient without change of gear; this is clearly due to the outside flywheel, which enables power to be maintained at slow speeds, while the fact that there are no internal flywheels retarded by the viscosity of the oil clearly adds to the efficiency of the engine. We are

left with the impression that the new Blackburne has made good, and will be a mount which will be much sought after not only in this country but in the Colonies, and will go far towards recapturing the trade, which, owing to the war, has been allowed to slip into allied but foreign hands.



(Top) Rear view of the Blackburne outfit. The width of the mudguards is a commendable feature. The two lower photographs give a good idea of the wild nature of the country that was traversed.

THE LONDON-EDINBURGH.

THE Motor Cycle Club has decided to hold a speed-judging competition on May 10th, and a petrol consumption trial early in June. The London-Edinburgh run, which was last held in 1914, will be resumed this year at Whitsuntide. The start from London will be on the Friday night prior to the

Whit-Monday, and the return journey from Edinburgh on the Monday, starting Sunday midnight.

The usual prizes will be awarded—gold medals within 22¼ hours, silver within 24 hours, and bronze within 30 hours. From what we hear, the event will be well supported.

A Remarkable System of Engine Construction.

All Main Parts built up from Stamped Steel Sheet.

A SYSTEM of engine construction which, if it proved to be successful, should be almost revolutionary in its results has been patented by Mr. A. W. Wall, of Sheldon, near Birmingham, who will be well-known to our readers as the designer of the Wall Auto-wheel, Roc gear, etc.

Only after some difficulty have we persuaded Mr. Wall, and those associated with him in this project, to give us permission to make some reference to the system, beyond a review of the number of patent specifications which have just been issued in regard to it, but which do not show the most recent applications of the principle. There is no desire on the part of its sponsors for premature publicity, but, as a matter of interest to our readers, we have obtained permission to give a few explanatory particulars.

Briefly, the idea is to build up the engine—that is, the cylinders, cylinder head, crank case, crankshaft, pistons, connecting rod, and other parts—from units formed by stamping steel sheets. A four-cylinder motor cycle engine, in addition to a car engine, is in course of construction, and we have inspected various finished parts, including the unit consisting of cylinder jackets and crank case. In regard to this main unit, it is formed of two stampings, which are bolted together at the vertical and longitudinal centre line. Each half is an exact duplicate of the other, and the only machining necessary before they are brought together is a grinding process which allows their contact faces to meet firmly all over. Grooves for oilproof packing and for direct oilways to the bearings are formed with the stamping.

Poppet or Sleeve Valve.

Into this shell are pressed the actual cylinder barrels consisting of steel tubes. When the engine is to be water-cooled, the jackets are also of sheet steel, pressed on to the cylinder casing, and water joints are formed at the lower ends by means of grooves in which packing material is inserted under pressure.

An air-cooled engine has its cooling fins similarly pressed on, and is naturally a simpler proposition.

Detachable heads occur in both types, and provision is made for sparking plugs, valve seats, valve guides, and other details when a poppet valve engine is in question.

The four-cylinder motor cycle engine now being made is of the four-stroke type, but two-stroke and sleeve valve engines are also in hand so far as designs are concerned.

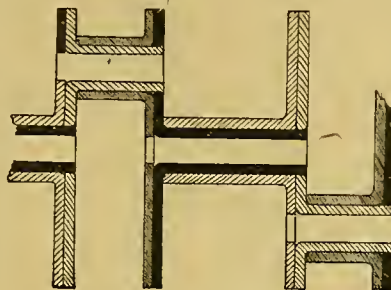
The crankshaft is particularly interesting. The journals and crank pins are formed by stamping a long spigot, in the centre for the journals and eccentrically for the pins, from each of several flat steel discs. Two opposed units, with spigots which telescope one within the other, constitute each journal or pin, and the two and also one disc of the next

unit are held together by, roughly speaking, burring over the ends of the spigots. Provision is made for preventing rotational movement between the telescoped parts, otherwise, of course, the shaft as a whole would be twisted all shapes by the torque it must convey to the flywheel.

The connecting rod bearings, of the roller variety, are put in position between the telescoping parts during the course of erection.

The advantages claimed for this form of construction are many, among them being extremely low cost, very light weight, unusual strength, and suitability for mass production. As to the practicability of the scheme, those who have associated themselves with Mr. Wall first obtained a considered opinion from one of the best known consulting engineers in the motor industry, and the favourable views that gentleman expressed convinced Mr. Wall's colleagues that the proposal was feasible and practicable.

Some thousands of pounds have already been spent in making the necessary dies and tools, for a sample engine could only be built after an equipment suitable for quantity production had been obtained.



Section of the built-up crankshaft.

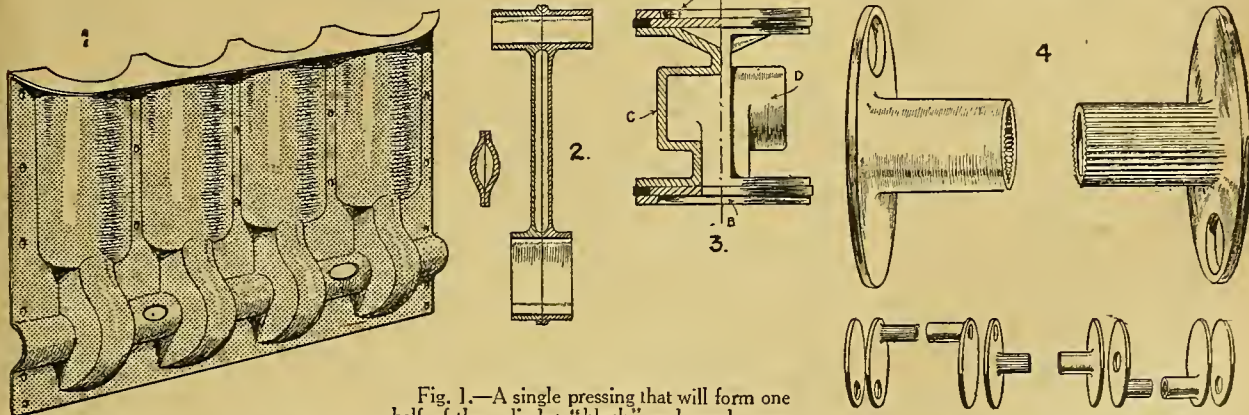


Fig. 1.—A single pressing that will form one half of the cylinder "block" and crank case.

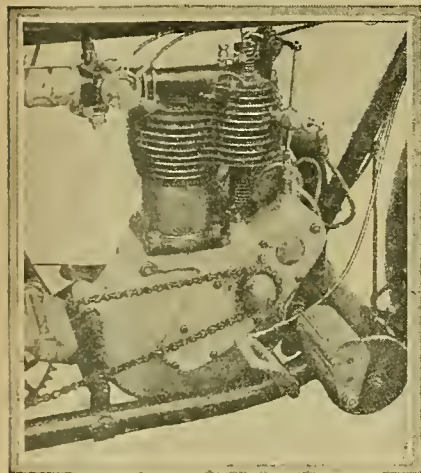
Fig. 2.—Section of the connecting-rod built up from two pressings. Fig. 3.—A piston built up of steel stampings; (a) head, (b) skirt, (c and d) halves of body. Fig. 4.—Units of the built-up crankshaft.

THE PEACE MODEL RUDGE-MULTI.

Modifications and Improvements in a Well-ried Design.

LIKE most of the large motor cycle manufacturers, Messrs. Rudge-Whitworth, Ltd., have taken some time to clear their factory of Government orders before resuming the production of motor cycles. Arrangements are now complete, however, for a fair output of the Multi model, which, as many of our readers are aware, won the last T.T. race.

The 1919 Rudge Multi can be said to be an improved pre-war model, modified in details, but not differing to any large extent from its predecessor. The main alteration is the new crank case, which now has smooth surfaces, all projecting ridges, with which in previous models



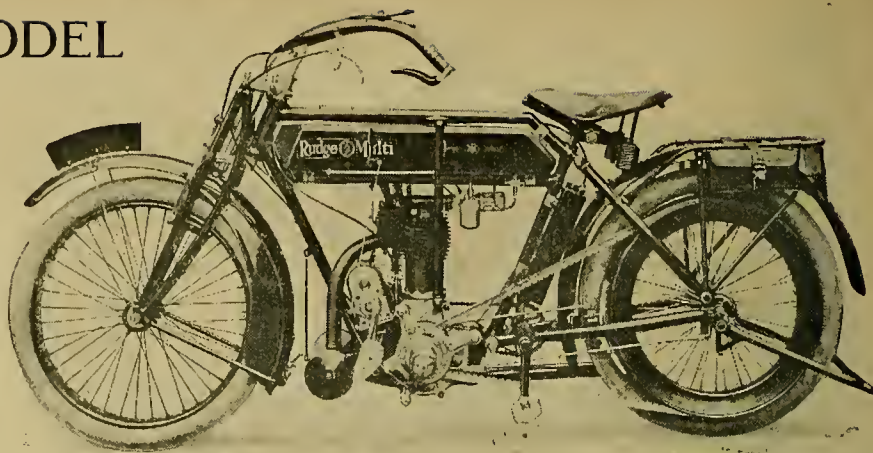
A crank case with a clean exterior is one of the improvements of the 1919 Rudge.

the crank case was ornamented, having been removed. This has a distinct advantage, as it is much easier to clean, and does not collect mud, as do many crank cases having rings cast upon them. The timing case cover, too, has a smooth face.

As of old, the engine has a bore and stroke of 85 mm. and 88 mm. respectively, and an overhead inlet valve actuated by push rod operated by a cam on the last of a train of gears, from one of which the magneto is driven.

There is another point where the Rudge engine differs from the majority. The pinion for driving the half-time gear has a vernier adjustment. The driving pinion has twenty-two teeth, and is fixed to the crankshaft, having twenty-one serrations. This, multiplied by two for the half-time gear, gives a vernier adjustment for timing the valves with a movement of less than one-half a degree at a time. The reader may work this out for himself as follows

$$\frac{22 \times 21 \times 2}{360} = \frac{1}{924} \text{ (part of a circle)} \\ = .388 \text{ of a degree}$$



An interesting feature of the Rudge machine, and one which is appreciated by many riders, is the method of carrying the lubricating oil and operating the pump. The oil tank is a separate unit clipped to the "seat" tube of the frame, and has a pump fitted in its lower end which is operated, through a Bowden wire, by a pedal near the right footrest. This ensures a petrol tank free from oil always.

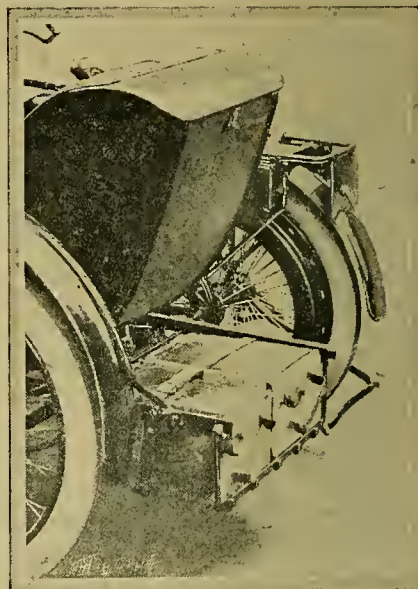
The Rudge sidecar is a particularly fine piece of work, and is larger all round than the pre-war model. The nose has been broadened considerably, and an adjustable footboard fitted.

Both cushion and back cushions are unusually deep and well sprung, and the height of the seat from the floor is higher than in the majority of sidecars, as will be seen from the accompanying photograph.

In addition to the usual locker under the seat there is a capacious compartment between the rear panel and the seat back.

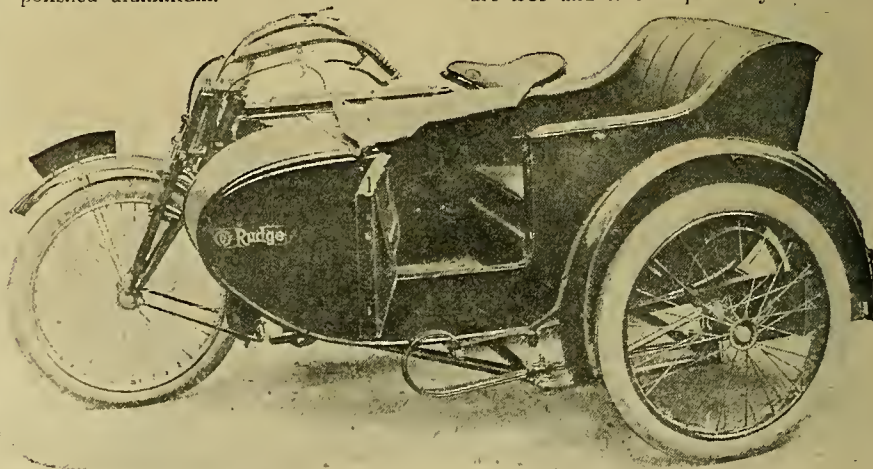
A grid with accommodation for two petrol cans is supported on a sub-frame which is carried by the two cross members upon which the body also rests. The grid is therefore sprung with the body, although the latter does not support the weight.

As regards the finish, this is as good as any, and far better than most sidecars we have seen. The top panel is of polished aluminium.



The rear locker and grid. The latter is carried on the sprung portion of the sidecar.

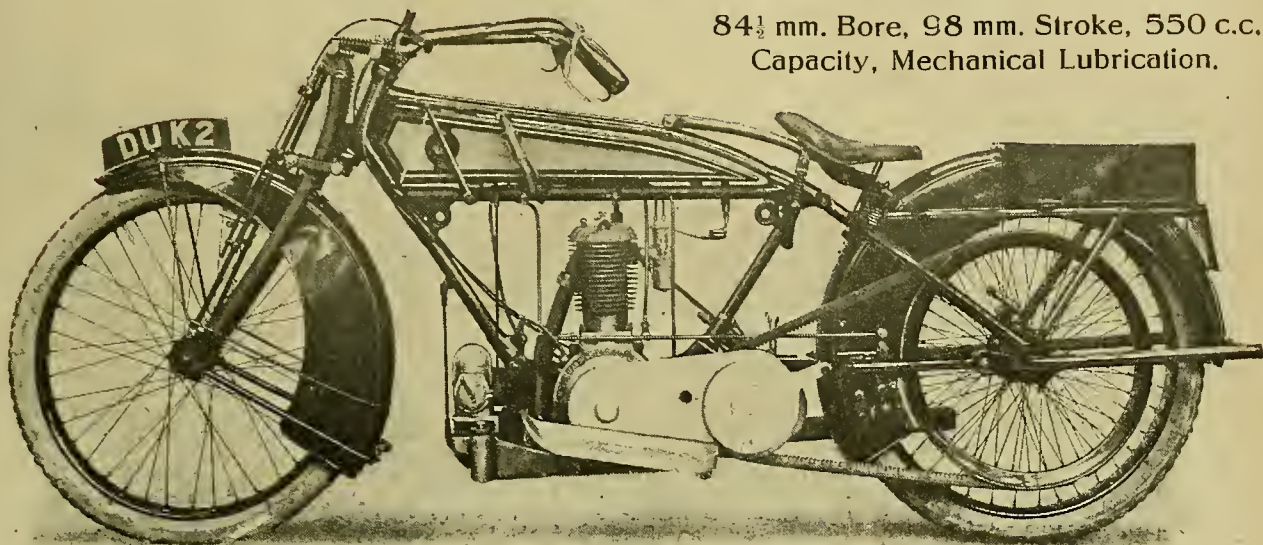
650 x 65 mm. tyres are fitted to both machine and sidecar, the prices of which are £80 and £30 respectively.



The 1919 Rudge sidecar, which has a larger and wider body than its predecessor.

THE REX SIDECAR SINGLE.

84½ mm. Bore, 98 mm. Stroke, 550 c.c.
Capacity, Mechanical Lubrication.



The new Rex, which will be known as Model 77, primarily designed for sidecar work.

ENTIRELY new models have been few and far between, many 1919 models being war-time designs improved in detail. So far as singles are concerned, it is about five years since an entirely new design was introduced. Therefore, the Rex 4 h.p. sidecar single undoubtedly will create a great deal of attention on this score alone. On two other counts this machine is particularly interesting. First, it is the latest model of a firm which has been associated with the motor cycle industry since its earliest days; and, secondly, the design is interesting in itself, both as regards the engine and the machine generally.

The latest Rex is essentially a sidecar machine. It has been designed throughout for passenger work, and is, consequently, heavier than most machines of the same capacity which are designed as dual purpose mounts. The requirements of the Overseas markets, too, have been borne in mind, hence the American type rims and 28 x 2½ in. tyres.

The Engine.

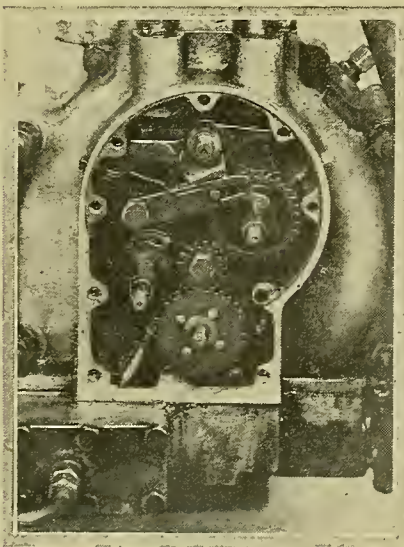
In design the power unit departs from the average single-cylinder motor cycle engine in at least one important point, i.e., the lubrication system. The crank case is in three main parts, two sides, and a base. The latter forms the bottom of the crank case, and also embodies a large oil sump extending forward to form the platform for the magneto.

On the left side of this sump is the oil filler, which has a screw needle for ascertaining the amount of oil in the sump.

From the sump the oil is circulated by a small gear pump on the right side of the unit, through an adjustable sight-feed on the tank, to a union on the crank case, which communicates with a circular channel, from which it overflows into a second channel, of which the base of the cylinder barrel forms the inner wall. In the latter are several holes for the entrance of the oil into the engine proper, from which the piston also takes its allowance.

The residue is constantly dripping into the base of the crank case, where it is maintained at a certain level for splash lubrication, after which it drains back to the sump *via* three holes in each side wall. These holes also serve automatically to provide more oil when the machine is going uphill, as, when the machine assumes certain angles, these overflow ports one by one go out of operation, and in consequence a greater depth of oil is accumulated.

In addition to the mechanical oiling system, there is an auxiliary hand pump which can be used to give the engine an extra charge of oil from the tank if or as required. The pump is on the side of the tank, and placed much further to the rear than is usual. Thus the Rex engine has two distinct oiling systems.



Timing gear of the Rex engine, showing the decompressor mechanism.

The cylinder has a bore and stroke of 84½ mm. and 98 mm. respectively, the capacity being 550 c.c. There appears to be ample radiating surface on the fins, which, along the side of the valve pockets, are cast straight instead of following a more or less circular contour; and between the valve pockets and the cylinder there is a clear air passage.

Side-by-side valves are used, operated by a single cam—in fact, one cam serves for inlet and exhaust valves and the decompressor.

The Decompressor.

The latter mechanism consists of a finger carried on a sleeve, which is mounted eccentrically on a shaft, to which the operating lever is fixed. Connected to the sleeve is an arm extending to an auxiliary rocker integral with the exhaust valve rocker proper, but is not connected directly to it. The auxiliary rocker has a stud fitting in a slot in the arm. Therefore, when the decompressor lever is so moved that the finger gets into the path of the cam, it partly rotates the sleeve and brings the stud to the end of the slot and so raises the exhaust valve during a portion of the compression stroke.

A single shaft, placed centrally, is used to carry the rockers, and the cam wheel is off the centre line. The other gear wheel in the timing case is for the purpose of driving the oil pump. There is a worm on the shaft of this latter gear, which drives a phosphor bronze wheel on the short shaft rotating the gear of the pump. This latter is a neat little device, consisting of two spur wheels in a small brass case, which can be completely disconnected by removing the union and six screws, without disturbing the timing case cover or any other part of the engine.

Aluminium Piston.

It is extremely interesting to note that the makers of the new Rex are pinning their faith to an aluminium alloy

The Rex Sidecar Single.—

piston. This is the subject of one of the several patents about the machine, and weighs threequarters of a pound, or about half the weight of a cast iron piston of the same size. As will be seen from one of the accompanying drawings, the piston is of the lantern type, while closer examination will show that two of the three rings are of unconventional section.

The designer has aimed at obviating direct contact between the aluminium piston and the cylinder wall, and this is attained by the L section rings shown. Neither the top nor the bottom of the piston can touch the cylinder walls, as



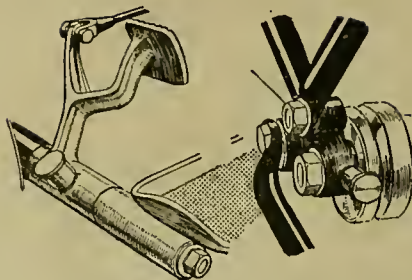
each end of the piston is cut away and the space filled by the ring. A groove is cut in these rings to distribute the oil along the path of the piston and to remove the surplus. A third ring below the top ring is fitted, and, like the others, it is $\frac{1}{4}$ in. wide.

The gudgeon pin works directly in the aluminium bosses of the piston, the small end being split and gripping the pin by means of a

The steering head, showing the method of lubricating the ball races, and the cone fixing for the handle-bar.

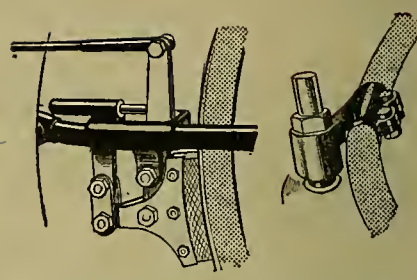
nut and bolt. A large bearing surface is obtained in this way, and we may say we have examined a piston which has done over 2,000 miles, and no appreciable signs of wear were apparent.

A double row roller bearing is used in the big end of the connecting rod, which is particularly light. The main shafts



The brake pedal is well supported on a long oil-bearing, which has a large lubricator.

Lubricator to supply oil to the ball bearing supporting the belt rim.



The rear brake, which has a parallel motion. The brake spring is enclosed.

The handle-bar lug, which permits the bar to be adjusted as to height.

are supported on large ball bearings with an extra bearing of the roller type on the driving side.

The wheels are of the quick detachable type with knock-out spindles, and are interchangeable, the pulley wheel, which is carried on a separate ball bearing, remaining in the frame. As will be seen from the drawing of the head, the lower ball race has a proper oil channel leading directly to it from a large lubricator in front of the head, while the top ball race is lubricated through oilways drilled at an angle from four holes, which are used also for adjusting the head. These holes are covered by a sliding ring.

Adjustable Handle-bars.

An adjustable handle-bar is another feature of the design; the bar, being gripped by a split lug, may be raised or lowered as desired by slackening two nuts. The other part of this lug fits on the steering head over a long tapered member having a key, and is held in position by a large "nut" having an extension for accommodating the lamp bracket.

Brampton Bi-flex forks are fitted, with a good size mud-guard and a front wheel stand. The front brakes are of the conventional type, but the wheel is rendered accessible by the brake shoes being so made that they can be swung round by loosening the two nuts which secure them to the stirrup.

The frame design departs from past and present practice. The top tube slopes to the rear but towards the rear end it is bent. From this tube the canti-



The drilled connecting rod and aluminium piston. The latter is fitted with three $\frac{1}{4}$ in. rings, two of which are stepped and have scraper grooves.



lever member of the saddle suspension is pivoted. The four sidecar lugs are integral with the frame, and the carrier member embodies a large metal tool box, which forms part of the rear guard. By removing four nuts this unit, consisting of carrier, tool box, and rear portion of the guard, may readily be removed.

Parallel Motion Rear Brake.

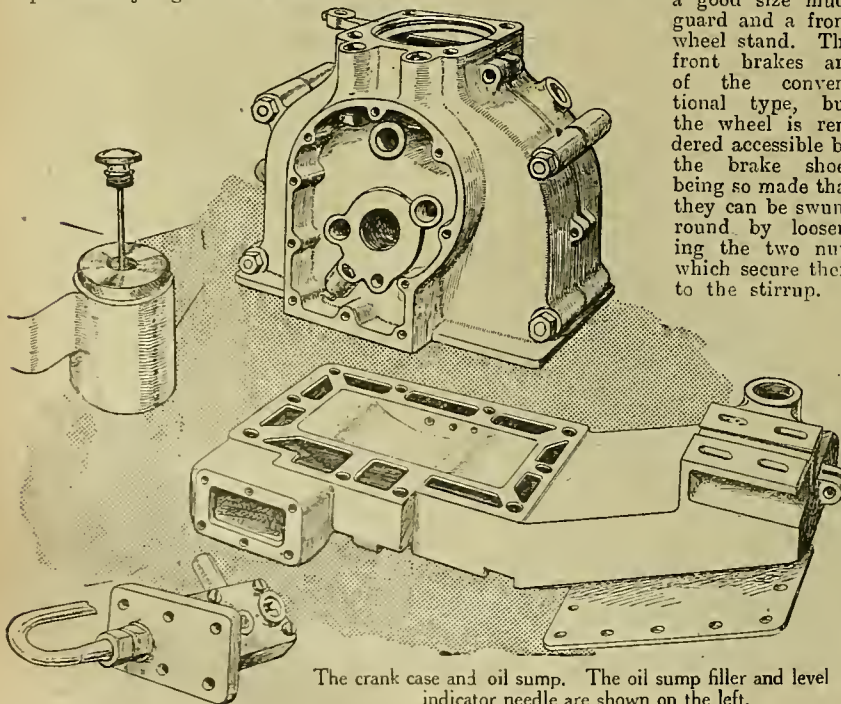
The rear brake has a parallel motion, and the fibre pad works inside the V of the belt rim. This brake is operated by a pedal, and is the only control at the driver's feet, all others being hand-operated.

On the left handle-bar there are the exhaust valve lifter and clutch levers, and on the right the front brake and carburettor controls. The magneto advance and retard lever is, perhaps, the largest we have seen on a motor cycle. This is located on the left side of the tank.

The finish of the machine is in black enamel, with very few plated parts, the handle-bars being finished by a new process, which renders the metal a dull black finish, somewhat similar to what is known as "gun finish." The tank is black and gold, with a manne panel.

A Sturmey-Archer three-speed gear box gives ratios of 5.2, 8.3, and 13.6 to 1.

The proposed price of the machine without sidecar is £32 10s.



The crank case and oil sump. The oil sump filler and level indicator needle are shown on the left.



Club News

N.M.C.F.U. (Leicester).

This branch of the Fuel Union will meet at 10 a.m. on the 20th inst. for the run to Stratford-on-Avon. Hon. sec., Mr. F. J. Underwood, 272, Humberstone Road, Leicester.

N.M.C.F.U. (Birmingham).

The Birmingham branch of the N.M.C.F.U. will meet on the 20th, for the inter-meet at Stratford, at Saracen's Head, Shirley, at 11 a.m. and 2 p.m. On Easter Monday there will be a picnic run to Badby Wood.

N.M.C.F.U. (Coventry).

For the run to Stratford-on-Avon for the national meet, the members will meet on the 20th inst. on the Common, Warwick Road, at 10.30 a.m. and 1.30 p.m.

N.M.C.F.U. (London).

Members of the London branch are asked to rally for the national inter-meet at Stratford-on-Avon, and those intending to participate in the run should communicate with the local hon. secs., Messrs. J. J. Moon, 1, Hunter Street, Russel Square, and L. A. Langford, c/o Messrs. J. A. Prestwich and Co.

Eastern Counties M.C.

The opening run of the Eastern Counties M.C. was to the "Bull and Horse-shoes," Harlow, and was a very pleasant and sociable gathering. Several of the members were in khaki, and new members were introduced. Over forty members turned out.

Ilkeston and District M.C.C.

The fixtures for the above club include a run to Skegness on the 18th inst., and to Ashbourne on the 21st. The club is affiliated to the A.C.U., and interested motor cyclists should communicate with the hon. secretary, Mr. A. Checkland, 106, Bath Street, Ilkeston.

Banbury and District M.C.C.

At an extraordinary general meeting of the Banbury and District M.C.C. it was decided to carry on the club as in 1914 with all available officials and committee. Vacancies due to the war were filled. The club's programme for 1919 is to foster the social side of motor cycling, and a few sporting events, such as a hill-climb, reliability trial, old crocks' trial, etc. Affiliation to the A.C.U. has been continued, and any motor cyclist residing in the Banbury district is invited to become a member. The opening run will be to Stratford-on-Avon on the 18th inst., meeting at headquarters at 12.30 p.m. Tea at Unicorn Hotel, Stratford, at 4 p.m. Hon. sec., Mr. H. A. Beard, 4, Horse Fair, Banbury.

Future Events.

- April 17.—Newcastle-on-Tyne M.C. Opening Run to Allendale.
 April 18.—Banbury and District M.C.C. Opening Run to Stratford-on-Avon.
 April 18.—Ilkeston and District M.C.C. Run to Skegness.
 April 18.—Middlesbrough and District M.C.C. Richmond Meet.
 April 18.—York and District M.C. Run to Richmond.
 April 19.—N.M.C.F.U., Sheffield. Run to Stratford-on-Avon for National Meet of N.M.C.F.U. on April 20th.
 April 20.—N.M.C.F.U. National Meet at Stratford-on-Avon.
 April 20.—N.M.C.F.U., Leicester. Run to Stratford-on-Avon.
 April 20.—N.M.C.F.U., Newcastle-on-Tyne. Run to Alston.
 April 20.—Troedyrhiw and District M.C. Opening Run to Porthcawl.
 April 21.—Birmingham M.C.C. Open Reliability Trial for Victory Cup.
 April 21.—Dublin M.C.C. Dunlop Cup Trial.
 April 21.—Ilkeston and District M.C.C. Run to Ashborne.
 April 21.—N.M.C.F.U., Birmingham. Picnic Run to Badby Woods.
 April 21.—Widnes M.C.C. Opening Run to Llangollen.
 April 21.—York and District M.C. Run to Fountains Abbey.
 April 26.—Public Schools M.C.C. Hill-climb.
 April 26.—Ystalyfera and Swansea Valley M.C.C. Hill-climb.
 April 28.—Edinburgh and District M.C. Open Reliability Trial.
 May 4.—Bolton and District M.C. Reliability Trial.
 May 4.—N.M.C.F.U., Sheffield. Reliability Run to Knutsford.
 May 10.—The M.C.C. Speed-judging Competition.
 May 21.—York and District M.C. Reliability Trial.
 May 24.—Birmingham M.C.C. Social Touring Trial. Week-end to Llangollen.
 June 6.—M.C.C. London-Edinburgh Run.
 August.—A.C.U. Six Days Reliability Trials.

Middlesbrough and District M.C.C.

The opening run of this club is fixed for the 18th inst., when the members will hold their Richmond meet, as in pre-war days. A very comprehensive programme has been drawn up for the year, including a hundred miles reliability trial in May. The hon. secs. are Messrs. C. C. Close and S. G. Randall, 5, Oxford Road, Middlesbrough.

Cumberland County M.C.C.

A large gathering of motor cyclists assembled for the annual meeting of the Cumberland County Motor Cycling Club, which was held at the headquarters, Carlisle. Rule 16, which debarred trade members from serving on the committee, was deleted. Mr. T. H. Daykin, 55, Etterby Street, Stanwix, Carlisle, was appointed secretary, and Mr. A. J. Hunt, Lonsdale Street, Carlisle, treasurer. It is intended to hold a concert and opening run at Easter.

Aberdare and District M.C.C.

At a meeting of the Aberdare and District Motor Club it was decided that the club be carried on as usual this year. It was resolved to become affiliated to the Auto Cycle Union as in previous years, and that the terms for membership should be as heretofore.

The members of the club are only too pleased to render any assistance to members of the A.C.U. who may be passing through Aberdare upon their writing to the secretary, Mr. A. J. Charles, 4, Tanybryn Street, Aberdare.

The Public Schools M.C.C.

A hill-climb for members of the Public Schools M.C.C. will be held on Saturday, the 26th inst. Members are to meet at the Rose and Crown Hotel, Tring, lunch will be served at 1 p.m., and a start for the hill will be made at 2 p.m. The cost of entry is 5s., and entries should be forwarded to the hon. sec., Lt. H. B. Browning, R.G.A., River Bank, Staines, as soon as possible.

There will be the usual classes, including a separate class for two-strokes if sufficient entries are received. The other classes will be: Class B., up to 350 c.c.; Class C., up to 500 c.c., including a class for sidecars; Class D., up to 750 c.c., including a class for sidecars; Class E., up to 1,000 c.c.; also a class for sidecars and three-wheelers.

A small silver cup will be awarded to the winner in each class. Competitors in this event will also gain marks for the Robinson aggregate challenge cup, a cup presented by the father of one of the members for the highest number of marks gained by any member during the year's competition.

Motor cycles must be in full touring trim, with mudguards, horn, etc., must not be stripped, and must be subject to examination. Lamps need not be carried. It has been decided to appoint representatives at the various public schools.

Members of existing public schools who are willing to act in this capacity should send in their names to the honorary secretary.

Oil in Proportion to Engine Speed and Load.

A New Throttle-controlled Oil Pump.

SINCE the majority of motor cycle engines are not fitted with mechanical oil circulation, the little pump illustrated here will undoubtedly interest most motor cyclists and many manufacturers of engines. It is manufactured by Messrs. S. A. Lamplugh, Ltd., King's Road, Tyseley, and consists of a simple form of roto plunger pump, which can be driven from the crank-shaft or the shaft on one of the timing wheels.

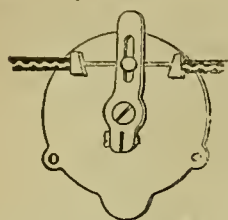
It will be seen that the main body of the pump consists of a circular aluminium casting, which can be fixed to the crank case or timing cover by three small screws, and has suction and delivery ports on opposite sides. In the lower part of the case there is a small gear wheel on a long spindle, supported in a bronze bush. The end of the spindle has flats cut on it to engage with a suitable slot

cut in the shaft, from which the drive is taken.

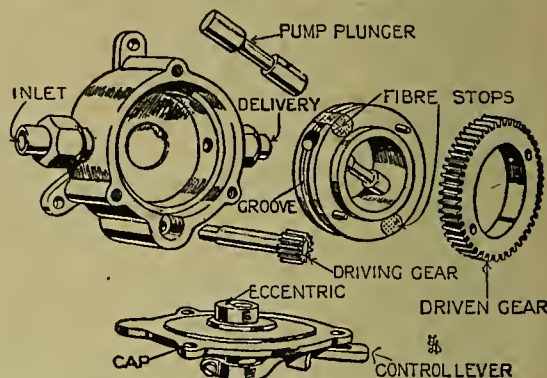
The small pinion meshes with a larger gear mounted on the rotor, the gear ratio being 8 to 1. The rotor is an annular brass ring with a groove cut round the periphery. This groove is divided into two equal sectors by fibre plugs, close to which a hole is drilled radially through the rotor. This hole forms the housing for the double-ended pump plunger, which is merely a steel spindle of a diameter equal to that of the hole and turned down to a smaller diameter in the centre to accommodate the eccentric controlling the supply. The latter is mounted on the cap of the main body, and is connected to an external lever by a steel spindle.

When the rotor revolves, carrying the plunger with it, the latter follows the contour of the eccentric, and, according to its position, the length of stroke is varied, the maximum being about $\frac{1}{16}$ in.

In action one plunger begins to suck in oil when the groove in the rim of the rotor is opposite the suction port, while the opposite end is moving outwards, and



The Bowden-controlled lever operating the eccentric for varying the stroke of the pump.



The Lamplugh throttle-controlled oil pump dismantled.

thus forcing the oil down the delivery pipe, which should be connected to the engine through a sight drip feed on the tank.

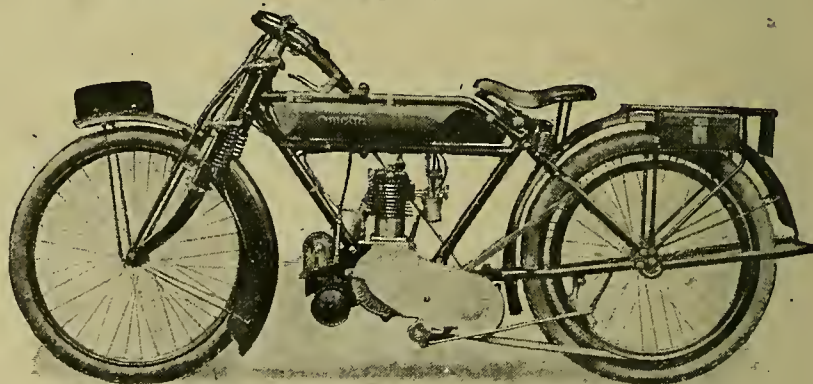
We are informed that the pump will be ready for the market in June.

Another Four-stroke Lightweight.

The 1919 Omega which is fitted with the 2 $\frac{3}{4}$ h.p. J.A.P. Engine.

BEFORE the war Omega lightweights were produced with both two and four-stroke engines, and probably the latter type was the better known. It will therefore come as no surprise that its manufacturers, Messrs. W. J. Green, Ltd., of Coventry, chose this kind of machine when they decided to concentrate upon one model for the ensuing year.

The new Omega is fitted with the latest type 2 $\frac{3}{4}$ h.p. J.A.P. engine, with the magneto in the forward position; otherwise the machine differs very little from its predecessors. 26x2 $\frac{1}{2}$ tyres are now fitted, and a two-speed countershaft gear is a standard fitment. The machine is supplied as a touring model with raised handle-bars, and as a sporting machine with semi T.T. bars.



The 1919 2 $\frac{3}{4}$ h.p. sports model Omega.

The National Meet of the N.M.C.F.U.

Rally of National Motor Cyclists' Fuel Union at Stratford-on-Avon.

THERE is every promise of a big gathering of motor cyclists at Stratford-on-Avon during the Easter holidays on the occasion of the inter-meet of the various centres of the National Motor Cyclists' Fuel Union. A good programme has been arranged by the organisers, and, although many of the branches will be in Stratford on the Saturday, the main programme is reserved for the day following.

Parties of motor cyclists are attending the meet from Portsmouth, Weymouth, Glasgow, Newcastle-on-Tyne, Sheffield, Manchester, Birmingham, Bristol, Coventry, Wolverhampton, Bedford, Nottingham, Leeds, Leicester, Lincoln, London, Derby, Liverpool, Barrow-in-Furness, Grantham, Rugby, and Ashby-de-la-Zouch; and one may regard the rally as historic, since many members are newcomers to the pastime.

The organisers announce that from 2 p.m. to 3 p.m. there will be a demonstration of the latest models. At three o'clock the visitors will assemble on the recreation ground on the riverside, where they will be addressed by the president.

At 3.30 p.m. there will be a circular run of approximately ten miles to Charlecote Park. A cinema film will be taken en route, and a prize will be awarded for the smartest turnout.



Make a Note of it !

EVERY member of the Auto-Cycle Union is entitled to have any summons arising out of the use or ownership of a private motorcycle defended in any police court in Great Britain or Ireland FREE.

The A.-C.U. provides an experienced solicitor and pays all his fees and expenses, and at any time an A.-C.U. member may obtain Free Legal Advice on any matter appertaining to motor cycling.

Trouble may overtake you to-day ! At any time you may be pulled up for exceeding a speed limit, having your number plates obliterated, or because your rear lamp has gone out—it is at such times as these that you appreciate the practical assistance provided by the A.-C.U.

10/- ANNUAL
SUBSCRIPTION
TO THE **A.C.U.**

brings you the following FREE Benefits:

FREE "GET-YOU-HOME" SCHEME, whereby in case of accident or breakdown on the road your machine is taken to the nearest garage and a car is placed at your disposal to drive you and your passenger home or to the nearest Railway Station, FREE Legal Advice and Defence on all matters motorcycling, FREE Assistance of the R.A.C. Road Guides, FREE Use of a Reading Room at the R.A.C., FREE Assistance in Touring and Foreign Travel, SPECIAL INSURANCE FACILITIES, etc., etc.

**Fill in and Post the Information
Coupon for full details NOW !**

Information Coupon

The Secretary,
AUTO-CYCLE UNION,
PALL MALL, LONDON, S.W.1.

Please send me further particulars regarding the advantages of becoming a member of the A.C.U., together with Application Form for membership.

Name

Address

"The Motor Cycle," 17/4/19.

"Sales of Government Motor Cycles."

"Quite a buzz of excitement was felt when the Auctioneer announced that he had now come to the 3½ h.p. Sunbeams. One was sold for 57 guineas and one for 56 guineas. Bidding was very spirited for these machines."

Vide "Motor Cycling," Feb. 4th, 1919.

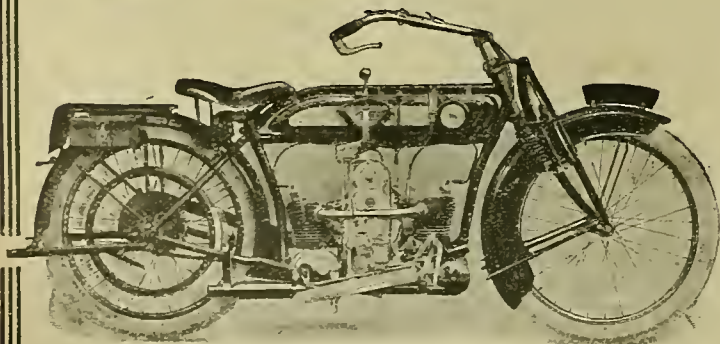
THE VALUE PLACED BY THE PUBLIC ON SUNBEAM MOTOR CYCLES CAN BE ESTIMATED WHEN WAR-WORN SECOND-HAND ONES COMMAND SUCH PRICES.

MAKERS :

JOHN MARSTON, Ltd., 11, Sunbeamland, WOLVERHAMPTON.

London : 57, Holborn Viaduct, E.C., and 157-158, Sloane Street, S.W.

Humber



3½ H.P. TWIN HUMBER.

"I purchased it in 1911, and have ridden it continually in all weathers (hail, rain, blow, or snow) for over 40,000 miles. My repair bill has been exceptionally light. The machine is looked upon as a wonder in this district." Sept. 11, 1918.

Thus Mr. D. Ward, East Brent, Highbridge, in the best type of reminder that your new mount should be a HUMBER.

HUMBER LIMITED.

Head Office and Works : COVENTRY.

LONDON { Showrooms—32, HOLBORN VIADUCT, E.C. 1.
& DISTRICT { Repair Works—CANTERBURY RD., KILBURN, N.W.
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THE REX ON THE ROAD.

On Warwickshire Hills with the New Sidecar Single

WE were able to examine the new Rex machine last week, and a description with illustrations appears in this issue. After our inspection, Mr. Hemingway, the enthusiastic manager of the Rex Co., invited us to follow the tracks of the sidecar single *sans* sidecar on a two or three hour run without stopping the engine.

A suitable sidecar was not available, but since the total weight propelled by the engine was almost twice that of a single of its size with normal rider, the test promised to be interesting. We admit that we anticipated an involuntary stop through some trivial incident such as generally happens when a rider sets out to keep his engine running for a specified time. Sometimes anxiety causes these stops, the carburetter chokes, or the throttle is closed in mistake for the air lever. It is so easy to stop one's engine when the run is not straightforward and instructions may be open to misunderstanding.

ahead in order to observe the machine on the hill.

Model 77 came up steadily, on top gear, until the last portion of the stretch of 1 in 6, when the Rex man changed down to second while travelling at 27 m.p.h. Turning at the top of the hill, he immediately ran down again, and repeated the climb, with practically the same results.

Controllability and Cool Running.

What impressed us more perhaps than the climb—we were on the hill only a week before with some particularly fast machines of lighter weight—was the manner in which the rider brought his machine to a standstill, declutched, and remained seated in the saddle for the next ten minutes with his engine ticking over with the regularity of a car engine. Upon request, he demonstrated to us the revving capabilities of the engine, and, this done, throttled down again to the slow running in neutral gear, with which we were familiar before the day was done.

From Edge we wended our way along the ridge of the hill, from which such fine views of Warwickshire are obtained, to Sunrising. Here Model 77 gave another demonstration, climbing the hill twice, each climb being practically identical, the rider changing down for the last portion, and finishing the climb well over 20 m.p.h.

We then had an opportunity of seeing that the rear brake was sufficiently powerful to bring the machine quickly to a standstill on the steepest part of the hill, with the engine still running.

Some time was absorbed on the top of Sunrising, discussing the Rex and things in general, and the engine was kept running for some time, but in order to permit a closer examination of some of its features we ordered a stop for a minute or so. Here it should be mentioned the machine is fitted with aluminium footrests, which pivot on the front supports, and may be raised when desired. The back connection is by a clip.

We were soon under way again *en route* for Newnham, which lay over twenty miles away, and between the two hills the pace was hot, but the Rex went up to within a few yards of the crest on "top." A second climb was made, with similar results, and finally, the Daventry side of the hill was taken on top.

A run to Rugby, through a blinding snowstorm, concluded the test, which covered about ninety miles of hard riding. The crank case was free from oil, and to summarise our impressions, we should say that the 4 h.p. low compression Rex will be found to be a very suitable machine for sidecar work.

However, the rider of the Rex is fully justified in claiming that he did all that was required of him. True, he stopped twice—once due to a misunderstanding and not through bad driving or lack of power, and once because we wished better to examine the machine.

From Coventry we made our way, with the Model 77, as it is called, to Stoneleigh and Warwick at a fair average speed, which, but for good company and the beauty of the splendid spring morning, would have been monotonous.

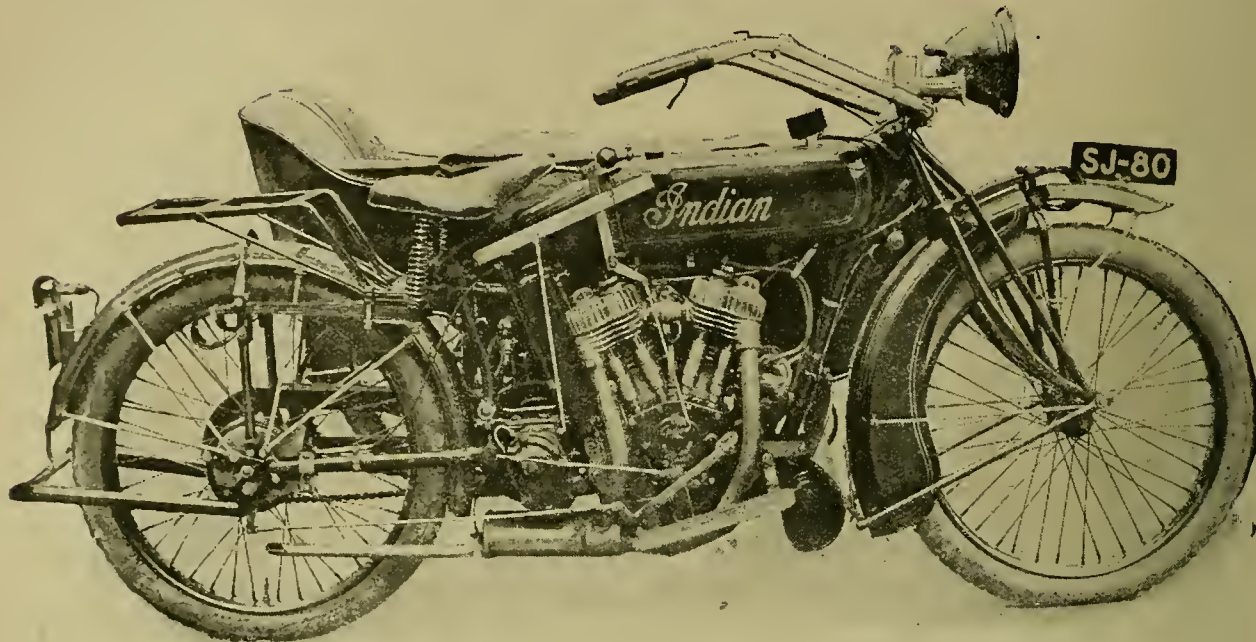
After leaving Warwick, only three villages lay along the road to Edge Hill, our first objective; and, in order to warm up "seventy-seven," we made the pace a little hotter, and, by arrangement, eventually drew



Scenes on Sunrising Hill during road demonstration of the new 4 h.p. Rex motor cycle.

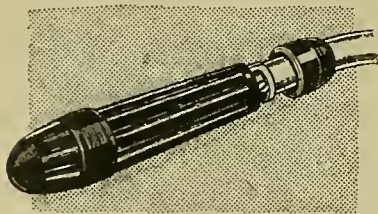
THE LATEST POWERPLUS INDIAN.

Side Lever for Exhaust Valve Lifter. Wires-instead of Rods for Twist Grip Control



Broadside view of the new 7 h.p. Indian sidecar outfit.

ONE of the centres of attraction at the M.C.C. opening run was the new spring frame Powerplus Indian ridden by Mr. E. Bridgman. Perhaps its most novel feature was the Splitdorf lighting dynamo, carried level with the bottom of the front mudguard and in front of the



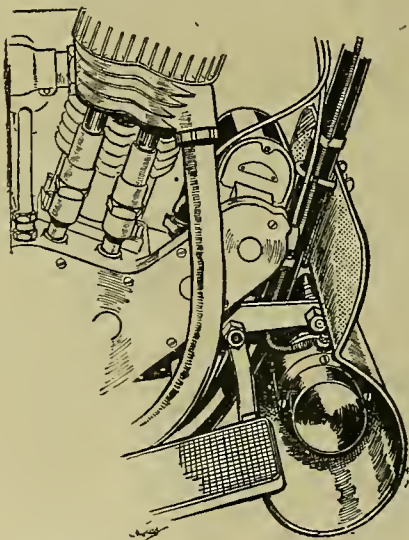
The Indian twist grip control, showing how access is obtained to the grub screw, the removal of which allows the grip to be withdrawn.

crank case and adequately protected by an ample shield. The drive is by spring belt off the engine-shaft, and the whole of the driving mechanism is neatly enclosed. A combined volt and ammeter is attached to the top tube, and the installation comprises a side lamp for the sidecar, a tail lamp, and a head lamp containing two bulbs, one giving full light and the other for use in populous areas.

In the main, however, the new Indian has not undergone any startling alterations, but it may be mentioned that the spring frame vertical members are now of T section instead of round, while the U bracket has been reinforced. A similar procedure has been adopted as regards the front forks, the main members of which are now of heavy gauge and rounded instead of D shaped.

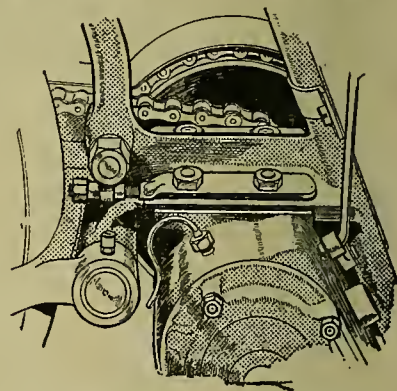
The engine itself has undergone little alteration, the bore and stroke being 79 and 100 mm. respectively, giving a total capacity of 980 c.c.

A new form of change-speed gate has been adopted, which is now fixed vertically at the side of the tank, and adjacent to it is a lever operating the exhaust lift. This strikes us as being quite a good idea, as it precludes the exhaust lifter being used for controlling the engine (always a bad practice), and places the device easy of access to the driver who is about to start his engine. The



Showing position of lighting dynamo in front of engine, and combined dynamo and leg shield.

carburetter and ignition controls, instead of being by flexible rods, are now by wires worked by twist grips. The forward end of the twist grip is provided with a cap which can be slid off, revealing the grub screw which controls the movement of the grip. If the grub screw



The gear box is easily adjusted on the Indian by a stud and nut engaging a projection on the main frame.

be removed, the whole of the mechanism can be dismantled easily. The carburetter is the well-known Schebler of an improved pattern.

The wheels themselves have undergone some alteration for 1919, being provided with more spokes and with better designed dust caps for the bearings.

On the particular model we saw, a most excellent American-made saddle was fitted, which was extremely comfortable. We were also greatly attracted by the strength of the triple head. The handle-

Latest Powerplus Indian.—

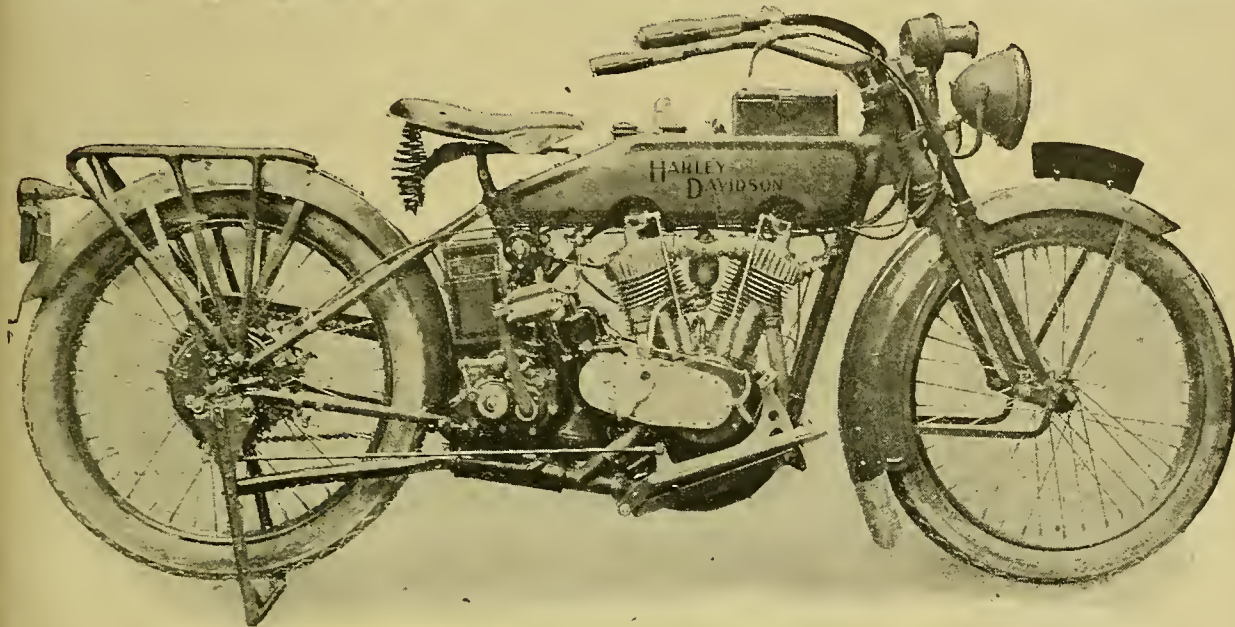
bar clip is of a pattern rather similar to that on the A.B.C., which does not allow the handle-bar stay to be raised, but permits the bar to be tilted to any convenient angle to suit the driver's taste.

The latest model embodies a larger exhaust box, wider brakes, and there are four stays to the rear mudguard. The particular model we saw is a sample, and at the present moment the company is unable to make delivery owing to the

prohibition on American imports. The same remarks apply to the Indian flat twin, which is now on view at the Hendee Mfg. Co.'s showrooms, Indian House, 366-368, Euston Road, London, N.W.1: an extremely neat little mount.

THE 1919 HARLEY-DAVIDSON.

Combined Lighting and Ignition Set. Overhead Valve Lubrication. Exhaust Cut-out.



The latest model 988 c.c. Harley-Davidson with Remy lighting and ignition unit.

ONE or two samples of the new 1919 Harley-Davidson sidecar machines have reached this country. In the main, the new model does not differ very greatly from the pattern we have already described, but it is interesting to note that it is fitted with the latest pattern Remy electric installation, which consists of a dynamo, accumulators, a coil, and a contact breaker. The dynamo serves to charge the accumulators, and to keep them in good condition for running the lamps and the ignition, while above the dynamo there is carried a coil, by means of which the current is converted from low to high-tension. The contact breaker is somewhat reminiscent of that on a magneto, and is driven by a vertical

shaft from the dynamo, and is in a position from which it is easily reached for the purpose of adjustment and cleaning. The accumulator is an Exide one, six volts, fifteen amperes. The switch controls the lighting of the head, side, and tail lamps.

In the Harley-Davidson engine the overhead inlet valve is still retained. It has always been found difficult to lubri-

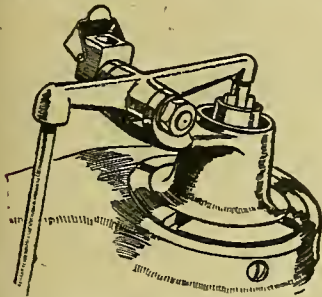


Exhaust box cut in section to show position of cut out. When the cut out is closed the gases are deflected into the exhaust box and thence to tail pipe.

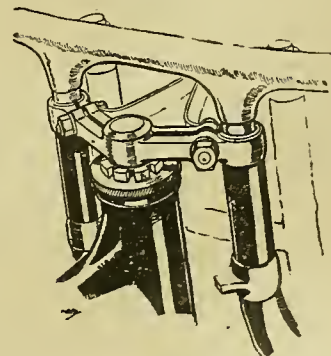
cate the inlet rockers of an overhead valve twin, and the latest Harley is fitted with a special wick lubricator, which will always keep the bearings moist, and will exclude grit.

Some improvement has also been made in the wheels themselves, the back wheel having wider hub flanges and heavier spokes. The method of attaching the handle-bars is interesting. They are provided with duplex tubes, held in two strong clips. The machine has an excellent front stand, and points of detail have been carefully studied. For

example, the horn is provided with a special support to keep it rigid, while the front mudguard is provided with a rubber flap, which is quite a useful idea, as it enables the machine to be wheeled off the kerb without any fear of the bottom of the front mudguard being bent. Another point of detail which is well worthy of mention is that the silencer is provided with a perfectly legal cut-out, in the form of a butterfly valve, which ensures the whole of the gases going through the expansion chamber before issuing into the air. Consequently, if the machine is not unduly noisy there is no legal objection to this particular form of release.



The spindles of the overhead inlet valve rockers are lubricated through a passage filled with felt, and supplied by oil from a container at the end of the rocker spindle.



The twin-clamp attachment of handle-bar to steering head.



Times to Light Lamps.

SUMMER TIME.

April 17th	...	8.27 p.m.
" 19th	...	8.29 "
" 21st	...	8.30 "
" 23rd	...	8.36 "

Easter.

The first "Peace" Easter since 1914 :
May the clerk of the weather be kind!

The Car T.T.

The motor car manufacturers ask that the proposed Isle of Man race shall not take place this year, as they are primarily engaged in reconstruction.

A Powerful Cycle Car.

At the recent Junior Car Club meet at Burford Bridge, a powerful racing car was seen trailing a length of Whittle belt, which, the driver maintained, "proved" that his vehicle was a cycle car.

Victory Cup Trial Entries.

There will probably be about sixty competitors in the Birmingham M.C.C. Victory cup trial on Easter Monday. In addition to the following, we understand there are at least twenty entries promised but not received at the time of going to press:

J. H. Bourne (8 Harley-Davidson sc.)
H. Boynton (8 Chater-Jap sc.)
T. Pike (2½ Lewis)
J. A. Masters (8 Harley-Davidson sc.)
R. D. Oliver (7-9 Indian sc.)
C. Pearson (4 Douglas sc.)
S. Smith (2½ Ivy)
Lt. J. Jameson, R.N. (6 A.J.S.)
E. Kickham (4 Douglas sc.)
R. H. Nicholls (4½ B.S.A.)
R. Charlesworth (5 Zenith)
D. R. O'Donovan (4 Norton)
J. Greenwood (8 Sunbeam sc.)
P. Delahaye (3½ Sunbeam)
J. Dudley (3½ Sunbeam)
G. Dance (3½ Sunbeam)
L. Baker (4½ B.S.A. sc.)
Rex Mundy (8 Matchless sc.)
H. P. Tatler (4 Norton sc.)
H. T. Smytheman (2½ Ivy)
H. R. Lane (4½ B.S.A.)
E. Kibble (4 Triumph)
E. R. Winkle (4½ James)
H. B. Denley (10 Morgan)
H. J. Stretton-Ward (4 Triumph)
—, Southwell (4 Norton)
G. H. Lovegrove (2½ Radco)
R. Troward (2½ Metro-Tyler)
L. Newey (3½ Ariel sc.)
Chas. Oerton (3½ Ariel sc.)
E. W. Croft (4 A.J.S.)
A. J. Young (2½ Sunbeam)
W. Austin Fell-Smith (8 Harley-Davidson sc.)
E. A. Bridgman (7-9 Indian sc.)
L. L. Sealey (4½ B.S.A.)
A. A. Farr (4½ B.S.A.)
W. J. Hassall (4 Norton)
J. L. Norton (4 Norton sc.)
H. Hassall (4 Norton)
T. Silver (Quadraut)
W. B. Gibb (2½ Douglas)
W. R. Steel (4½ B.S.A.)
B. Bellfield (—)
P. Stevens (4½ James)
H. Kuhn (2½ Lewis)
P. W. Moffatt (3½ Douglas)
C. Percival (4½ B.S.A.)
S. Wright (3½ Humber)
H. Petty (3½ Norton)

Prices.

The increased cost of 1919 motor cycles over pre-war products, while apparently heavy, compares most favourably with the extra cost of cars.

Hill-climb in South Wales.

The Ystalyfera and Swansea Valley M.C.C. are organising a hill-climb on Easter Monday, which will be held at Bwlch, two miles above Craigynos, on the Swansea-Brecon road. The competition will start at 2 p.m. Classes will be run for 2½ h.p., 4 h.p., over 4 h.p., and for sidecars. The event will be confined to members, but an invitation is extended to motor cyclists in the surrounding districts to join the club. Those interested should communicate with the hon. sec., Mr. T. P. Lewis, Gurnos, Ystalyfera. The entry fees are 2s. 6d. for one event, and 1s. for every subsequent entry.

The Spring Frame Chater-Lea.

The spring frame Chater-Lea created a great deal of interest when it made its debut at the M.C.C. opening run. The sprung portion of the frame consists of a triangle, one end of the base being hinged on to the rigid portion of the frame, while the other end of the base carries the rear wheel. From the top of the triangle to the fixed portion of the frame there runs a laminated spring; the bottom end of which is rigidly fixed, while the top end slides in a slot. The sidecar wheel is suspended in a very similar manner.

Special Features.

LATEST AMERICAN MACHINES.

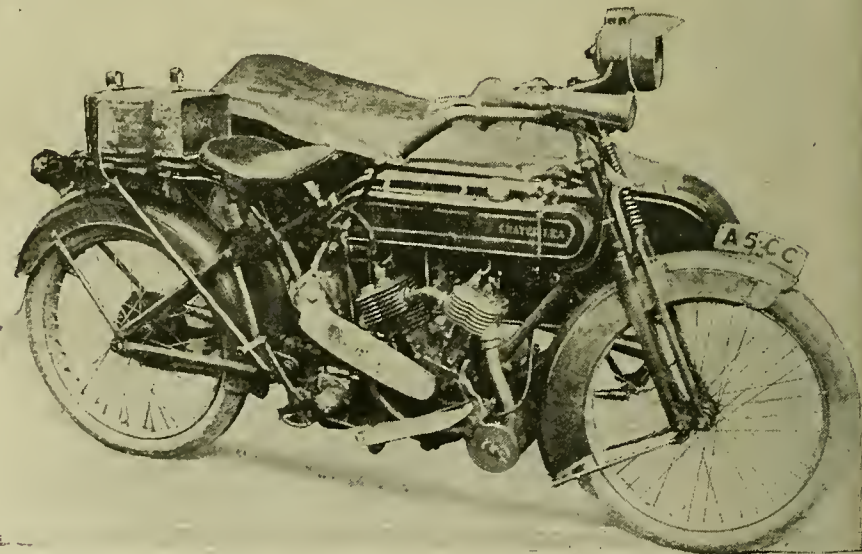
NEW SIDECAR SINGLE.

A REMARKABLE SYSTEM OF ENGINE CONSTRUCTION.

The Import of Foreign Motor Cycles.

It is obvious that the prohibition of the importation of foreign-made motor vehicles will not be retained indefinitely. Not many weeks ago the Board of Trade representative in the House of Commons made an announcement which seemed to indicate that the existing prohibition would remain in force at any rate until the beginning of next September. Various committees have been appointed in connection with the Import Restriction Department of the Board of Trade to deal with each class of goods, and, so far as we can ascertain, these committees have been very active, and have taken a good deal of evidence from the commercial interests concerned. It is anticipated that some sort of rationing scheme will be adopted shortly, as was stated in *The Motor Cycle* last week.

It is just possible that a distinction will be drawn between the imports of motor cycles and imports of motor cars, since the number of motor cycles brought in from abroad is considerably less than that of four-wheelers. Since this is so, the Government may come to the conclusion that the percentage of motor cycles may be fixed at a higher figure than that for cars.



The experimental spring frame Chater-Lea mentioned above.



N.M.C.F.U. MEMBERS EXPERIENCE A BLIZZARD IN DERBYSHIRE.

Whenever there is the slightest prospect of snow, one can usually be sure of a blizzard on the Derbyshire hills. On a recent run of the Sheffield N.M.C.F.U., the members were caught in a gale while crossing Baslow Moor, the photograph being taken at the highest point immediately the snow had ceased.

Mechanical Oil Pump on M.A.G.

Mr. O. de Lissa, of the M.A.G. Co., turned up for the M.C.C. opening run on his old M.A.G. sidecar, with an engine fitted with a mechanical oil pump.

Petrol Licences.

The number of licences issued to motor cyclists by the Petrol Control Department is as follows: First issue, 95,098; second, 48,580; third, 34,462; fourth, 29,152; fifth, 45,189; sixth, 56,309. Included in the sixth issue there is also a total of 37,003 licences issued to owners of private cars and motor cycles which are now grouped together.

Olympia Car Show.

The late Mr. Byam Shaw was consulted by the Society of Motor Manufacturers and Traders, Ltd., on the subject of the stand and building decoration for the November Olympia Motor Show. Circumstances have prevented the carrying out of his ideas of a suitable setting for the display of motors from all the allied countries, but it is to be hoped that something of the kind may be possible in 1920.

The scheme which is in preparation for the forthcoming international exhibition will, however, be a big departure from the past.

Imports and Exports.

The value of motor cycle imports admitted into this country under licence during March amounted to £12,634. We stated last week that there is a possibility of their being greatly increased, and in the near future firms may be allowed to import 50% of their pre-war quantity.

EXPORTS.

It is cheering to note that export values for March show an appreciable increase. There is an advance of £39,936 over February's figures, while the table below shows respective figures for March, 1917, 1918, and 1919.

	1917.	1918.	1919.
Motor cycles	£78,850	£32,593	£154,202

Petrol Economy and the Colour of Tanks.

A paragraph published recently in *Chambers's Journal* under the heading of "Science Notes" points out that the British Red Cross have been experimenting with petrol tanks in hot countries, and have discovered [We think it is not a recent discovery.—ED.] that tanks painted white cause the least loss of petrol vapour by evaporation. The experiments were made by placing a powerful arc light three feet away from tin plates painted various colours, and in one case the tin plate was unpainted. The rise in temperature was noted in each case, and it was found that the best results were obtained from the all tin plate, the worst being from the one coloured black. White was finally adopted, because the tanks had to be painted for other reasons.

The above is not written with the idea of suggesting white as a colour for motor cycle tanks, because loss by evaporation is so small as to be negligible.

A Warning.

Motor cycle thieves are very busy in Glasgow just now, and some particularly daring cases have been brought to our notice. One reader's garage was broken into and his 1919 Triumph detached from the sidecar and stolen.

To Purchasers of Speedometers.

We hear that there are a number of Stewart speedometers in this country made to register in kilometres per hour, with the dials altered to read in miles per hour. Needless to say they are not being distributed by the recognised importers of these instruments, Messrs. The Cooper Stewart Engineering Company, Limited, who are at a loss to know whence they are coming. The word "kilometres" is neatly erased, and "miles" substituted, the alteration not being noticeable until the dial is carefully examined.

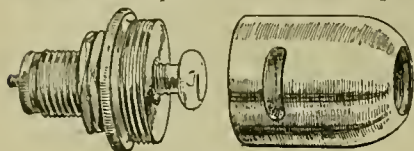
Readers should not purchase speedometers without a close examination.



The meet of the Birmingham M.C.C. at Hockley Heath last week on the occasion of the opening run to Stratford-on-Avon.

THE UNIQUE ELECTRIC REAR LAMP.

ONE of the neatest electric rear lamps for motor cycles we have seen is known as the Unique, and is the product of Messrs. M. Mole and Son, of 51-54, Charlotte Street, Birmingham. It is exceedingly small, its diameter approximating to that of a shilling; it is exceptionally strong, and the ruby glass is well protected. A slot is cut in the side of the lamp to give a white light on the number-plate. To fit the lamp is



An electric rear light lamp of very compact design.

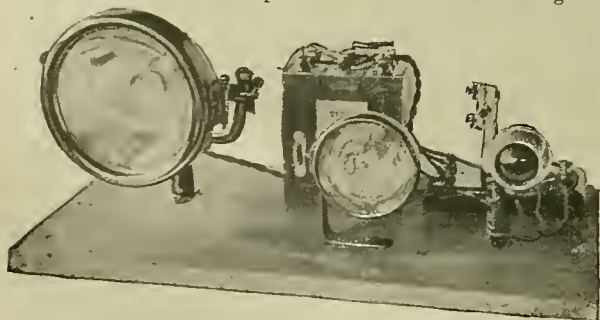
quite a simple matter. A hole about half an inch in diameter is drilled, and the lamp then fits snugly against the number-plate, and is secured in position by a nut and lock-nut. Well finished and nickel-plated, the lamp sells for 5s. complete with 4-volt bulb.

ELECTRIC LIGHTING SETS FOR SIDECARS.

ALTHOUGH electric lighting was a novelty on motor cycles a very few years ago, there are quite a large number of machines now fitted up with electric lamps. Some of these machines are fully equipped with dynamo lighting sets, and the other extreme—the dry battery—is to be found on machines which at night are used only for short distances. Between these two systems there is the accumulator set which will always be popular where recharging facilities are available.

The lamp set illustrated on this page is one of two marketed by Messrs. H. Taylor and Co., 21, Store Street, London, W.C.1, and consists of a six-volt 40 amp.-hour accumulator, a head lamp, sidecar lamp, and rear light.

Both the head and the side lamps are finished in black, the former having an adjustable fitting which allows it to be set at any angle, and has an adjustable bulb holder for focussing. The tail lamp is of cast aluminium. A switchboard is provided and fitted with a trembler switch. The lamps are of the two-pole variety, and the side and tail lamps are in series



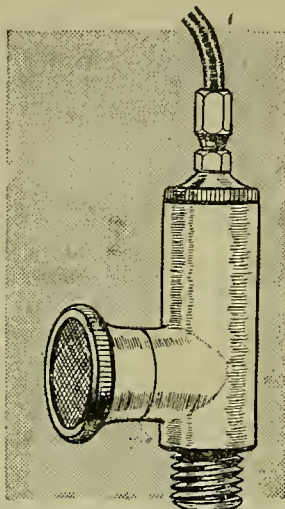
A battery electric lighting set suitable for a sidecar outfit.

so that in the event of the latter giving out, the rider receives intimation at once because the side lamp also goes out.

Messrs. Taylor also market a less expensive set consisting of three cast aluminium lamps, which is more suitable for town work than touring.

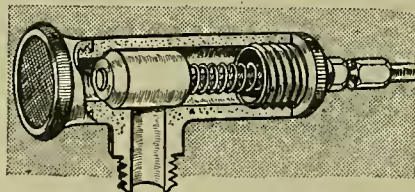
AN EXTRA AIR VALVE.

IN these days of heavy and expensive petrol and benzole an extra air inlet is often a useful fitting, resulting in great economy and a cooler engine. Messrs. Bowden Wire, Ltd., Victoria



The Bowden air inlet with the position of the gauze-covered inlet changed over.

Works, Willesden Junction, London, N.W.10, have lately placed on the market a special extra air inlet for motor bicycles.



The Bowden air inlet in section.

This consists of a properly ground-in valve which, when closed, entirely shuts off the air, and ensures an easy start. The main body of the air inlet has two outlets tapped with the same thread, so that the gauze cap will fit on either.

This arrangement is a great convenience to anyone fitting the device to his motor cycle, as it enables the air inlet to be placed in whatever position is most convenient, according to whether or not there is sufficient room to place it vertically. If not, it can be placed horizontally. Carefully screwed into the inlet pipe, and provided with a lead washer, it should be quite secure and free from air leaks.

STRAP SUBSTITUTES.

WITH reference to the article contributed by F.A.S. on page 170 of our issue for February 20th, Messrs. Henry Milward and Sons, Ltd., needle and fish hook manufacturers,



Milwards' strap substitute.

Washford Mills, Redditch, inform us that they have a quantity of turnbuckles in stock which may be used for drawing tight steel wire used in the place of straps, as suggested in the article previously mentioned. For attaching such rigid articles as a wooden box or petrol can to a luggage carrier these wires and turnbuckles should be extremely useful.

READERS' ROAD REPORTS.

OUR request for reports of road condition has resulted in much detailed information coming to hand. The following are a few of the reports very much condensed:

Great North Road to Darlington, Durham, Newcastle, and Edinburgh.—Good condition, with exception of two or three miles after passing Wentbridge (eleven miles from Doncaster) and short lengths near Micklefield, about twenty miles from Doncaster. After passing Braham the road is good. The North Road to York (via Tadcaster): Fairly good to Tadcaster, very bad from Tadcaster to York. North Road to York (via Selby): Fairly good.

The road to Gainsborough, Louth, etc., excellent from Bawtry onward. The road into Lincolnshire to Scunthorpe, Brigg, and Grimsby (via Hatfield and the Keadby New Bridge), fairly good straight forward from Belton via Beltoft to Althorpe; the "Tween Rivers Road" very bad, the whole width of the road having been stoned without being rolled in.

Northwich to Tarporley.—One mile poor out of Northwich. Remainder very good.

Liverpool to Preston, via Ormskirk.—Good generally. One bad stretch one mile north of Aintree to three miles north of Aintree.

Ormskirk to Southport.—Excellent.

Ormskirk to Tarleton.—Excellent.

Birmingham to Wolverhampton.—In a very bad state.

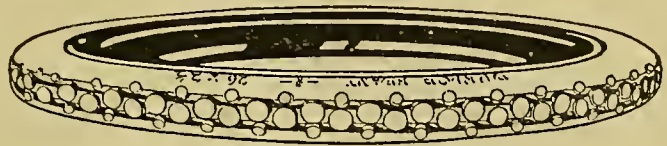
Birmingham to Stratford.—Fairly good.

Wolverhampton to Stafford.—Poor generally.

Stafford to Nantwich.—Good generally.

Scotland. Inverness to Wick.—From Inverness to Beaulie, very bad—ruts and pot-holes. Stretches fair to Conon, very fair to Tain and Ardgay. Bonar Bridge, bad. Best road via Dornoch to Golspie, Brora, Helmsdale, fair. Best to go round via Tain rather than branch Novar to Kincardine. Very bad near Altnamain, owing to timber traffic.

Owing to the serious condition of the road from Bristol to Ilfracombe, via Bridgwater and Williton, motor cyclists, when arriving at Nether Stowey, are advised to take the second turning on the right on leaving the village, passing through the village of Stringston, and thence to Watchet and Minehead.



DUNLOP RUBBER STUDDED COVER.

REAL SAFETY.

TYRES with an effective non-skid device are a definite insurance against trouble.

These Dunlop rubber studded non-slipping motor cycle tyres afford very complete insurance. They're entirely effective because the studs are staggered, the big centrally placed studs take up the main drive and the smaller studs at the side prevent side-slip when the motor-cycle's canted.

It's a great tread and a great tyre.

Dunlop

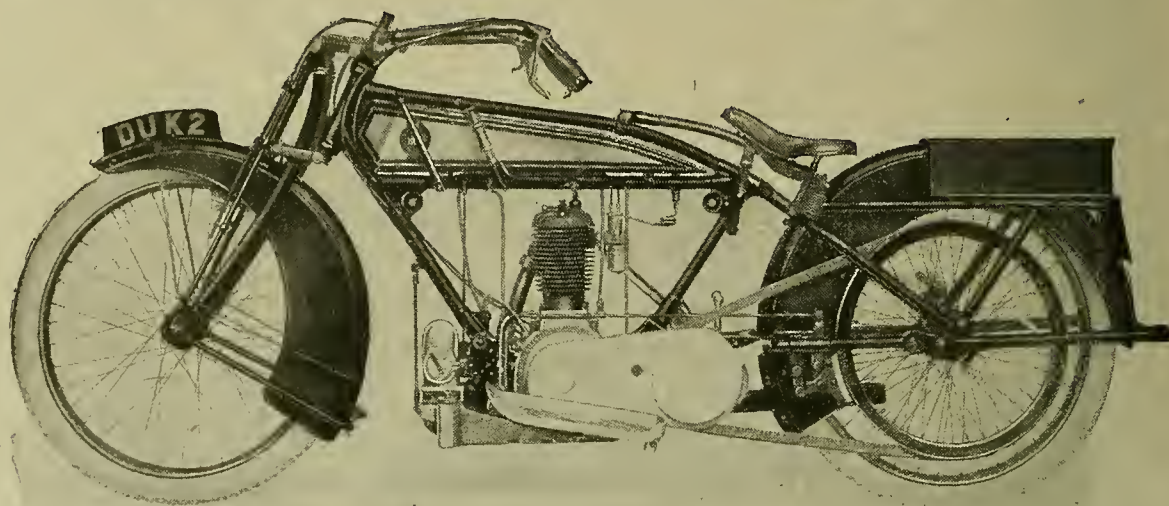
DUNLOP RUBBER CO., LTD.,

Founders of the Pneumatic Tyre Industry,
Para Mills, Aston Cross, BIRMINGHAM.

LONDON: 146, Clerkenwell Road, E.C.1.
Telephone 5375 & 5376 Holborn.

Are you playing a DUNLOP GOLF BALL ?

Gentlemen—The King

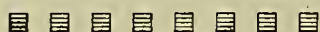


The New 4 h.p. Rex Single-cylinder Standard Motor Cycle.

550 c.c.

MODEL 77

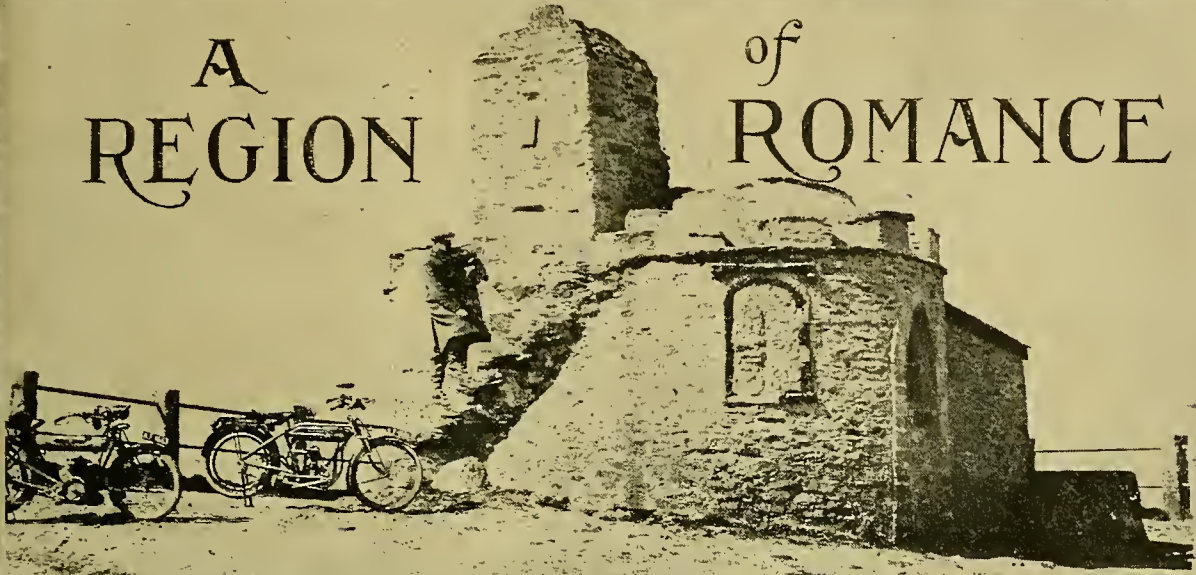
The Sidecar Single.



THE REX MOTOR MANUFACTURING
CO., LTD., ————— COVENTRY.



A REGION of ROMANCE



The Huers' Hut at Newquay—a fisherman's tower, whence a look-out used to be kept for schools of pilchards.
The motor cycles are a Triumph two-stroke and a New Imperial.

IN the minds of most people "Cornwall" suggests a remote part, separated, as it were, from the rest of England, and associated with legends, superstitions, and traditions galore. The "Delectable Duchy" is looked upon as a far-away land where, not so very long ago, its inhabitants lived in a partly civilised manner. It seems a kind of mystery county, with holy wells, cromlechs, stone circles, crosses, and tales of giants, fairies, and spectres. Probably the reason why Cornwall seems so isolated is because centuries ago all the British inhabitants in the West of England were ordered to reside on the further side of the Tamar. The people thus shut off retained their own language and customs longer than they would otherwise have done had they mixed with others. Even now, in some parts of Cornwall, a visitor or "up-country" man is spoken of as a "foreigner"—although he might have come no farther than from Somerset.

Halfway between Plymouth and Penzance, forty miles from each, is St. Austell, the centre of the china clay industry; and in this neighbourhood the writer and his friend, mounted on a Junior Triumph and a New Imperial Jap, have often

visited some interesting spots, a few of which are described and illustrated here.

The superior kind of clay out of which some of the most beautiful porcelain is made is obtained in this locality, and thousands of tons of Cornwall's "white wealth" is used every year for paper-making and other purposes. China clay is simply decomposed granite, and the streams which run through the pits are so whitened that the district has the appearance of a land flowing with milk—if not with honey. Huge pyramids of sand are dotted here and there, left behind and piled up after the clay has been washed out, giving a distinctive appearance to the landscape. Just as some lucky people are said to be born with silver spoons in their mouths, so Cornishmen—or a large number of them—may be

said to come into this world with pick and shovel in their hands. Thousands of Cornwall's natives take to digging and delving like ducks take to water. In this locality they dig for china clay, and the enormous open pits, dazzling white in the sunshine, bear witness to their industry.

A spin of eighteen miles through old-world villages and country lanes, by



A Cornish china clay mine near Hensbarrow.

A Region of Romance.—

way of St. Stephen's, will bring Newquay into view. It has been transformed in recent years from a little fishing hamlet into a modern watering place, occasionally favoured by Royalty. On the headland stands an interesting structure known as the "Huers' Hut." This is the point of vantage where a lookout was kept for the "schools" of pilchards which periodically visit the shores of Cornwall. Fishermen, always on the watch, would give the signal—"Heva! Heva!!"—to others waiting in the boats below.

King Arthur's Hunting Ground.

From Newquay to Lostwithiel is a fine run, part of the way being along the Goss Moors, where is one of the fastest and straightest stretches of road in England. According to tradition, this moor was once a splendid hunting ground, and afforded good sport to King Arthur and his knights in their time. Excellent snipe shooting is still to be obtained there.

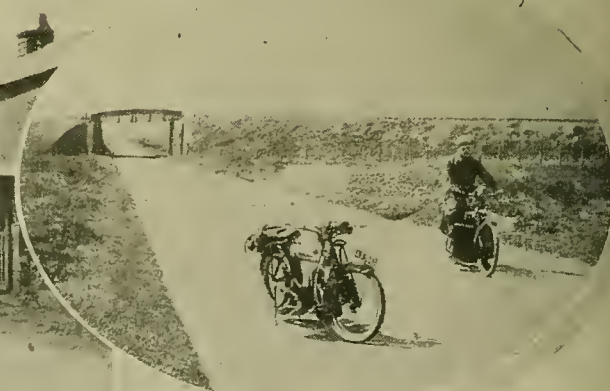
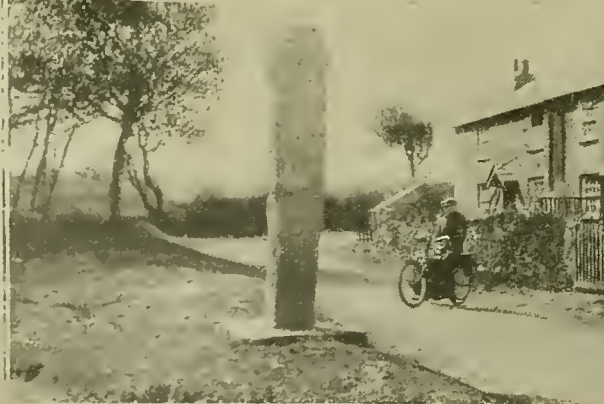
The four-stroke proved slightly faster than the Junior Triumph here, and gradually drew away from it when both were "all out." But there is really very little difference in the two machines—or at least these two—at speed or hill-climbing. The two stroke is rather more comfortable to ride, and at a speed of thirty-five miles an hour, which is about its maximum, is as steady as one could wish. The writer

has ridden it two thousand miles, and has had no trouble whatever, except that caused by one of the first new British magnetos. This magneto was readily exchanged by the makers for another, which has given every satisfaction. The top gear performances on the little Triumph are extraordinary, whilst the stiffest hills even in Cornwall may be tackled on low gear. There seems to be no fault to find with the "petrol" system of lubrication, and it is simplicity itself. Simply add one and a third pints of suitable oil to a tin of petrol, shake up well, and fill up the tank. So long as there is any fuel to run on, the rider can rest assured that the lubrication is looking after itself—the more gas given and the faster the machine goes, the more oil the engine and bearings get. Riders of some two-strokes, it would appear, experience trouble occasionally in starting. The Triumph is one of the easiest starters imaginable—it two-strokes perfectly right away, and continues to do so. Full air can be given, and speed controlled without any further alteration of the air lever. The New Imperial has also proved very reliable, and nothing better could be desired in the four-stroke lightweight class.

The Oldest Railway Station.

At Ruthern Bridge, which can be easily reached by turning off the Goss Moor, in the form of an old-fashioned thatched cottage, stands the oldest railway station in England. It is near the terminus of a branch of the London and South-Western Railway. In days past the line was used for conveying minerals and goods to Bodmin and Wadebridge. Passengers obtained their tickets at the cottage, and rode in open trucks. Two engines, known as the "Elephant" and the "Camel" used to deal with all the traffic.

Near Roche, which is about six miles from St. Austell, there is a remarkable group of rocks, consisting of huge masses of granite towering one above the other to a height of a hundred feet. The ruins of a chapel stand in the centre, formed by the adaptation of masonry to the natural rock. A hermit, it is said, used to reside in this lofty edifice. Some distance away lies the Holy Well. There was once a chapel near the well, and the figure of a saint, but both have now disappeared. It was the custom of the peasantry to offer



(Top) Roche Rock, a lofty abode of a hermit in former days. (Left) A Cornish wayside cross. (Right) A fast road across Goss Moor.

A Region of Romance.—

the saint pins, which were bent and thrown into the water. Another holy well is situated nearer St. Austell, within the remains of an old baptistry, wherein also bent pins may still be seen. The custom was to throw these bent pins into the well and "wish" at the same time. People were "ill-wished" in this manner, the pins representing, according to some authorities, miniature daggers—signs of injury to those against whom the "ill-wishers" had a grudge. Still another well is to be found at Holywell Bay. Here it was the custom for a pin to be placed carefully on the water; if it floated the wisher expected to obtain his wish.

Near Roche, the road leads past Hensbarrow, a mound on a lofty part of Cornwall, commanding a view of both seas. This is supposed to be the burying-place of a prince or prince's of remote antiquity. Close by is another mound known as Cocksbarrow. The long barrows are held to have been erected by a long-headed pre-Aryan race, the round barrows by a later round-headed Celtic people. In the latter cremated bodies have been found, and in one burying-place over fifty urns were found around the principal and central one.

Church used as a Stable.

Nine miles the other side of St. Austell lies Lostwithiel, in a hollow by the Fowey river. Its interesting church possesses one of the most beautiful of the old spires in Cornwall. The old font, with its grotesque carvings, was subjected to great indignity in 1644, when the church was used as a stable and barracks by the Parliament forces. One of the troopers

baptised his horse from it, by the name of Charles, to show his contempt for the church and king.

Prettily situated about a mile from the town are the magnificent ruins of Restormel Castle, probably built at the time of the Conquest. The outer wall is surrounded by a circular keep, with a tower and gatehouse, and a moat, now dry, sixty feet wide and thirty feet deep. The ivy and creepers with which the castle is now covered give it a very picturesque appearance. It is two storeys high; the upper one, wherein the state rooms were situated, had some fine Gothic windows. An oven of remarkable size was a feature of the kitchen quarters.

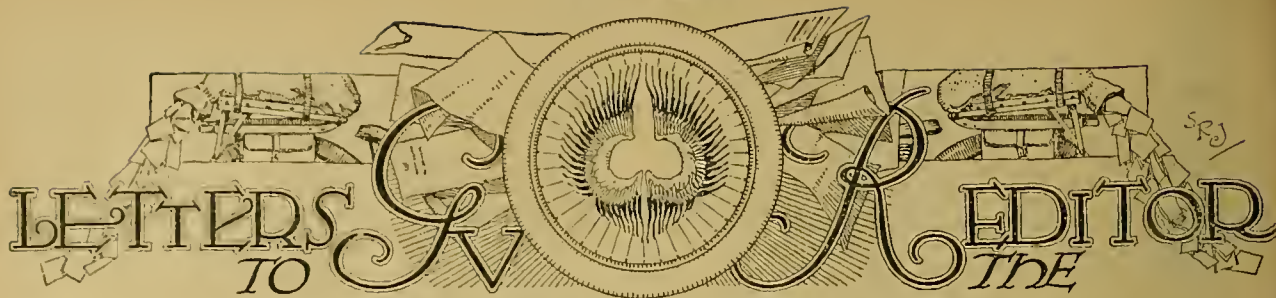
Sinners and Saints.

Steeply up Lostwithiel the road passes, near Castle-down, an old Cornish "cross." The wayside "crosses" scattered throughout the county are familiar features—tokens of the teachings of missionary saints who introduced Christianity into the land. Many parishes, towns, and villages are named after these saints. Asked why there were so many saints in Cornwall, as compared with other counties, one worthy is credited with the reply that it was to counteract the large number of sinners there! At all events, one of these saints did the neighbourhood a good turn, for he taught the British the art of wool-combing, and St. Blazey, further on the road towards St. Austell, is named after him.

These are but a few of the many interesting places to be found in this part of Cornwall, and now one can travel about again—"in peace," more or less, there will be the usual large number of visitors to see them again shortly.

SIDECARRING IN THE U.S.A.

Indian outfts on an American highway, Massachusetts. Its surface appears to compare favourably with British roads. The scenery, too, in this State is fine.



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

IN STOCK!

Sir,—I beg the hospitality of your columns to protest against the practice extremely prevalent among trade advertisers just now of quoting various popular makes of motor cycles as "in stock," or "for immediately delivery," when such is not the case actually at the time of advertising. This is not only extremely disappointing to would-be purchasers, but results in considerable waste of their time and money, to say nothing of their tempers. I can see no point at all in this deliberate misrepresentation, for all motor cyclists are perfectly well aware of the difficulty of obtaining machines just now. This practice, if continued, is likely to lead to discrediting of advertisers by the public, and must ultimately reflect on the reputation of the firms concerned.

B. HUMPHREY.

TABLOID HISTORY OF AIR-COOLING.

Sir,—I read with interest the letter by "Revs." under this heading, in your issue of April 3rd. I regret that I did not see the letter by "Road Rider" on this subject, but, apparently, he said that rotary engines are the most wasteful of all types with petrol and oil. "Revs." agrees with him.

Excessive oil consumption I do not dispute, but I do not agree with the statement as to petrol consumption. It is generally believed that rotaries are extravagant in petrol, but this is entirely erroneous. "Revs." mentions the Le Rhône and Bentley engines in his letter; at 15,000 feet, fully out, the former consumes $8\frac{1}{2}$ galls. per hour, the latter 11. There are several stationary engines, which, at the same height, consume anything from 14 to 18 galls. per hour, so the rotary scores.

In the penultimate paragraph of "Revs.'s" letter, he says, "It yet remains to be proved that the more improved types, the Le Rhône, Clerget, Canton-Unné, Bentley, etc., can really favourably compare with the latest radials for fast scout work." Surely he should have said it yet remains to be proved if the latest radials compare favourably with the rotaries. It is fairly obvious to what radials he is referring, but they have not yet been proved.

PITOT.

PROTECTION OF THE MOTORING PUBLIC.

Sir,—May I be allowed to warn your readers of the necessity of extracting from all motor firms the same safeguards as these are in the habit of obtaining from their customers?

Doubtless there are few firms which definitely resort to sharp practices, but, unfortunately, there are some whose negligence where other people's property is concerned verges on the criminal. One should not be put off by such phrases as "That will be all right; we'll see about that for you."

About twelve months prior to the Armistice I was recalled to France at the usual short notice, having only a half-day to settle up my affairs in the depot. I made a clear verbal arrangement with a responsible member of a motor firm to collect a detached sidecar the next day from my billet, and to keep or sell it for me. Not long after arriving in France, I wrote to the firm, to be satisfied that the sidecar was in their possession. No reply was sent to my letter, and, thinking that any reputable firm would at once tell me, had they not taken possession of my property, I let the matter drop.

On coming home recently, I wrote again, and learned that the firm professed ignorance of the whole matter. They excused themselves by saying that the member of the firm with whom I made the arrangement had now left, but they

conveniently made no reference to my unanswered letter to themselves.

I trust there are not many officers or men whose absence on service has made them victims to such methods of business. This little lesson has cost me £10, so that is why I take the liberty of trying to share it with your readers.

THE LEARNER.

MAKERS AND PROMPT SERVICE.

Sir,—I quite agree with Mr. C. F. Edmunds regarding the prompt and business-like methods of the Scott Engineering Co. Recently, on my way from England to Scotland, the rear chain of my Scott gave out, and I wired the makers from an unknown address in the Lowlands to send me a renewal. I possessed no permanent address at the time, had not written the Scott Engineering Co. for two years or more, yet they remembered my name as that of an old customer, and despatched the chain on the same day as they got my wire.

Later I wanted a sidecar cone, and received it in a post or so, with apologies for the high price they were compelled to charge, which was due, they explained, to the cone being an obsolete type, with the result that a machine had to be specially fitted up to make it, with resulting expense and delay.

When the Scott people have overhauled and tuned my machines they have always made a splendid job of them, and such prompt service is a real pleasure—especially in these days, when everyone seems so ready to take advantage of the extraordinary state of things in order to obtain maximum profits at a minimum expenditure.

B. Mossdale.

ADVANTAGES OF A TWO-STROKE.

Sir,—Being a very enthusiastic two-strokeite, I am afraid I cannot let F. W. Varney's letter pass without comment. Has "Ixion" noticed it, and does he remember his remarks of my "Some Bicycle"?

I have ridden many two-strokes, including Levis, but have never obtained such results as F.W.V. claims.

My present machine, an Excelsior-Villiers, which is the best I have owned, will do 45 m.p.h. for a few minutes on a good road, but certainly not *average* 45 m.p.h.; 25 m.p.h. would be nearer the mark. F.W.V. also claims 35 m.p.h. average with a sidecar. Surely there is a mistake somewhere.

It is really marvellous how these little engines will pull, and, in my opinion, they are ideal for the rider who is out to see the beauty of our country, but, of course, are no use to the speed merchant who scours the country at 60 m.p.h. and sees nothing but the road.

The chief trouble of most riders I have met seems to be overheating if the engine be run fast for any length of time. However, in many cases, particularly where lubrication is by drip feed to induction pipe, the cause of drying up which follows is oil shortage.

With this method of lubrication, the drip feed is considerably affected by crank case suction, which is very high at small throttle opening, but when opened out the vacuum in the crank case is partially destroyed, and the drip slows up just at a time when more oil is wanted. However, I find if I keep the exhaust a bit on the smoky side, and open the oil for a speed burst or hill-climb, there is no trouble.

It was a great surprise to me to see such a small percentage of votes for the two-stroke in your "Which Type?" voting results. I should like to hear readers' remarks *against* this type, and why they did not vote for it.

EXCELSIOR.

King's Heath.

WHAT SHALL WE WEAR?

Sir,—I have been much interested in several letters in your paper from lady motor cyclists on the subject of dress. I drive a Royal Enfield combination, and though at first I had a coat or two chewed up in the chain, I cannot understand anyone who has once tried it giving up riding, as one of your correspondents says she has done, on account of the difficulties of finding a suitable costume.

I have solved the problem quite to my own satisfaction, and my friends tell me my outfit looks very smart. I wear a land worker's kit made of brown corduroy velveteen, with a neat little hat to match, to which my vanity has added a touch of orange woollen embroidery. The coat reaches nearly to the knees, and is loosely belted; it has a large pocket each side, and a small breast pocket; the collar can be turned up in cold or wet weather; breeches are ordinary equestrian ones, and I wear riding boots, or in wet weather a pair of rubber Wellingtons, and carry with me a set of youths' waterproof overalls. For very cold days I have a light sleeveless fur jacket which, worn over a knitted jumper, and under my corduroy coat, defies even a north-east wind. I have a skirt to match my costume, which buttons all down the front, and if I wish to be very respectable I put this on over my breeches when I dismount. I find nothing keeps my hands so warm as angora rabbit-fur gloves, but these are very expensive and do not wear well for cycling. I find string hunting gloves warm and strong, and they have the advantage of never getting slimy as leather gloves do when very wet.

I find that in these enlightened days my costume does not make me very conspicuous, and at the same time does not make me look a frump. (Mrs.) BEATRICE BRADLY.

SILENCERS.

Sir,—The "noisy" motor cycle controversy prompts me to forward details of what I consider to be an improvement to the silencer of an 8-10 h.p. twin 1912 J.A.P. engine.

The ordinary silencer shell, end plates, and bolts were used, but the baffle plate was taken out and a short length of 1 in. steam tubing (gas tubing would do) with a reducer screwed on the end.

The whole is held together by the usual three bolts which go right through, and, incidentally, hold the cup or "reducer" tightly in place. The silencer is suspended by two ordinary cycle chain adjusters, through the holes of which the front bolt, which holds the engine into the frame, passes.

The effect of this design is that the gases enter and leave on the same side, the gases passing into the shell, impinging on the cup, striking the end plate, and passing out through the pipe and fish-tail end without obstruction.

The result is astonishing to those who know the noise that an 8 h.p. twin can make when opened out, as it is now difficult to distinguish explosions from the noise of the valves and the whirr of the chains. The engine will help a sidecar along at about 45 m.p.h. without distress, and does not overheat.

The alterations can be carried out by any plumber, or, if done at home, from materials obtained at any good ironmongers, will cost about 3s. to 4s. CB 486.

THE NEW A.B.C.

Sir,—May I thank Mr. Bradshaw for his courteous reply to my criticisms. I note that he agrees with me on point number one, and is inclined to do so on number four and number two. I am glad the mudguards are not narrow; they appeared so in the illustration. Number five in my suggestions was simply on the score of appearance; if there is any real objection to the grease cap on the spindle end, I will give way. It is, however, sometimes used.

With regard to number three, the height of the splashguards. My own experience shows that these should be at least as high as the top of the tank. In support of my contention I would mention the fact that a contemporary stated that the A.B.C. was so well mudguarded that the

mud which, after a long run on bad roads, was deposited on his knees brushed off easily when dry. Truly a wonderful testimonial to mudguarding efficiency.

JOHN HOLLAND.

Sir,—You have passed an "old chestnut" fallacy in "The Impressions of the New A.B.C." by B. H. Davies. I refer to his remark on page 276, *re* ball or roller bearings requiring no lubrication. This is certainly untrue, as any engineer will agree. There must be a certain amount of sliding or friction between the balls and the race, if the difference of diameter of inner and outer race is finite. In other words, if the balls have a finite dimension, there must be friction.

I think this misleading statement should be corrected—hence my rush into print.

May I add one remark on the design of this delightful mount. The spring frame (rear) is out of date very badly. Could not the carrier be so arranged that one's luggage would not suffer from vibration? I speak feelingly. The last trip I made, my tooth paste got well mixed up with a cake of chocolate, a tooth brush, and some brilliantine.

C. W. PIDCOCK.

Sir,—I read with great interest the descriptions of the new A.B.C. motor cycle and some of the criticisms of it. In design it is without doubt several years ahead of any other post-war machines of which I have read the specifications. With one or two exceptions it is practically a perfect solo mount. The improvements which I suggest could easily be incorporated, and would add considerably to its refinement and exclusiveness. These are:

(1.) The brakes should be a fixture on the frame rather than on the wheels, to allow of—

(2.) Interchangeable wheels being fitted. Manufacturers seem to think that the owners of *de luxe* sidecar outfits are the only class who desire this convenience.

(3.) An oil bath chain case, easily detachable if necessary, should be fitted, at any rate for machines for use in this country. This is an infinitely preferable method of oiling the chain. Spraying oil on to it is bad, as with the road dust the oil makes quite a good grinding compound.

Edinburgh.

CONNOISSEUR.

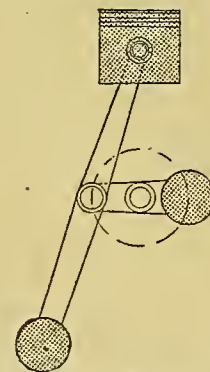
BALANCING A SINGLE-CYLINDER.

Sir,—I think you are not quite accurate in saying, in your editorial in the issue of April 3rd, that it has hitherto been impossible to balance a single-cylinder engine, though, of course, it is true that no system has been successful enough to come into practical use on any scale.

It is, however, possible to balance a single-cylinder engine by prolonging the connecting rod beyond the big end and

putting there a bobweight heavy enough to make the centre of gravity of the connecting rod assembly coincide with the crank pin. As the mass of the connecting rod, piston, bobweight, etc., coincides with the crank pin, it can be balanced by a rotating balance weight, balancing the whole mass.

At half-stroke, of course, the rotating and reciprocating parts are all moving at the same speed as the balance weight, and are therefore balanced. At the top and bottom centres the piston is stationary, but the bobweight is moving twice the speed of the balance weight, and therefore the engine is still balanced. I think in this manner that the effect of the connecting rod angle is balanced, and the engine therefore more perfectly balanced



Method of balancing an engine.

than a four-cylinder vertical. An engine balanced on this principle was shown at one of the motor shows a good many years ago. I fancy that the reason it did not come into use was that it increased the wear on the big end.

F. STRICKLAND.

[The method to which our correspondent refers is illustrated in Professor Sharp's book, "Balancing of Engines," and gives excellent primary balance, but a very pronounced transverse couple. Also Mr. Strickland has quoted us incorrectly. We said that the single-cylinder could not *by any convenient means* be balanced perfectly.—Ed.]

AN UNUSUAL INCIDENT.

Sir,—In your issue of March 27th I notice reference to a disturbance in Dublin, when some officers were threatened, and their motor cycle and sidecar thrown into the Liffey. Surely, I think, you describe this incorrectly when you call it an "Unusual Incident in Dublin"! HAD SOME.

Bridlington.

WHERE IS A GARAGE WANTED?

Sir,—For the last few months (since my demobilisation) I have been searching around for a suitable locality in which to recommence business. I intend opening a garage to cater especially for motor cyclists on repairs and accessories, etc. Up to the present every locality I have considered good has been crowded with firms in the same line, who have obviously come into being during the war.

I am sure there must be places which are not so well catered for, and where the motor cyclists of the locality would like someone to look after their needs.

It struck me that if you would be kind enough to publish this in your valuable paper, perhaps some of your readers would communicate with me through you.

I should like to state that I am an engineer and have previously been in the trade. I volunteered in 1914, being one of the original D.R.'s. My connection has been lost during the war, and has naturally drifted to another, who, not having joined up, reaps the benefit. MONS.

Shepherd's Bush.

MOTOR-ASSISTED BICYCLES.

Sir,—For many years we have been ardent admirers of your publication, particularly enjoying your unbiased editorials and the constructive criticisms of your contributing writers. We therefore feel that you will welcome our calling your attention to what we feel has been an unjust "obituary," appearing in your February 20th issue.

It is true that Cyclemotor production was reduced almost to a negligible quantity during the period of the war. Being originally a Canadian concern possibly accounted for our taking an early interest and interpretation of the world war situation, which resulted in our early enlistment as a 100% manufacturer of war essentials, and during the time of the war we were important factors in helping to manufacture Hispano-Suiza aeroplane motors, as well as to design and produce certain features of the Handley Page.

We realise that possibly to those not fully informed, the Cyclemotor has been temporarily lost sight of, due to the more important world issues at stake; but we feel that it is hardly just to read a concern out of the industry because it has been patriotically devoting its entire energies to the nation's service.

It is therefore natural that we wish to place our position properly before your readers. By the time this letter appears Cyclemotor and Evans Power Cycle production will have resumed its normal pre-war output, and by June our increased manufacturing facilities will permit a 50% increase over former capacity. We have at the present time on our books active orders that have accumulated during the war period which, with recent new business at hand, will tax our manufacturing ability up to January, 1920.

We can assure you that we absolutely propose to meet with our best and undivided efforts the fast-growing demand for our product both at home and abroad.

CYCLEMOTOR CORPORATION,
A. C. PRICE, Sales Manager.

Rochester, N.Y., U.S.A.

LOSING ONE'S PROP.

Sir,—"Torque" in his turn ignores another common cause of a lost-prop—failure to maintain sufficient pressure when running on "bottom tank," and with the Rowbotham pump sluggish or out of action.

But we are not concerned so much with the causes of lost props as with the fact that every lost prop spells a forced landing with a stationary engine. "Airmick" has "never seen a propeller stop rotating whilst the machine is in the air, unless the engine seizes, and then the propeller-shaft generally breaks." It is hardly relevant to the discussion to mention the fact, especially as he professes to agree with "Torque," who holds that props may be lost through several causes, and again because "considerable experience" would, one has supposed, have dispelled his rather vague views on propeller slip as expounded in his letter.

The "question before the House" is—When one has lost one's prop with a stationary engine, can one regain it solely by setting the controls, etc., in the starting position, and putting the machine into a dive?

"Torque's" generous offer of the handsome wreath makes me think that he is not now so confident that losing one's prop with a stationary engine is a matter of small account. I would remind him that he asked me for *any* service type, so that he can barely grumble at my choice.

"Airmick" also asks for an example, and as he is a seaplane man, I give him the 320 h.p. Sunbeam and the 240 h.p. Renault-Merc. If his "considerable experience" extends to large flying boats, he will no doubt have met the 345 h.p. Rolls-Royce. Perhaps he may even be able to prove "Torque's" point and qualify for the wreath!

REVS.

WANTED, WEATHER PROTECTION.

Sir,—I was much interested in reading the letter under the above heading signed A. W. Mansfield, as it exactly fits my own case. I became tired of repeated mud baths and sold my sidecar outfit. Then I bought a two-seater car of a good make, but, whilst I am now immune from mud splashes, I have the disadvantages enumerated by Mr. Mansfield, namely, lack of vim in ascending a hill and the necessity of changing down on hills that my motor bicycle would take on top. I wrote to the manufacturers of my last machine expressing my satisfaction with the power and reliability of the engine, and asking if they could not devote a little attention to *real* mudguards; but in their reply their sole interest seems to be centred in mass production on a larger scale than before, and they are not at all interested in the demands of the public.

I know of many motorists who speak with disgust of a motor bicycle, because of the lack of protection from mud, and of others who would become motorists but for that drawback. You give an illustration of a new sidecar outfit (6 h.p.) which has a metal shield to protect the silencer and magneto from mud. Why could that shield not be extended on each side to protect the driver also? I am getting sick of the term "ample mudguards" with every new machine put on the market, when we all know perfectly well that they are very far from ample. College mudshields are very good as a substitute, but, being of leather, they become torn. People who talk about wind resistance make me tired. Mudshields cause no more wind resistance than the rider's legs. Why cannot the footboards be continuous and form a mudshield connected to the front forks, or at least to the front down tube?

It would also be a great convenience if we could have enclosed tappets, so that conversation with one's passenger would be possible. The manufacturer who is enterprising enough to provide a motor bicycle with real mudguards, spring frame, and noise eliminated to such an extent that conversation with the sidecar passenger is possible without shouting at the top of one's voice, provided, of course, that the engine is thoroughly reliable, will certainly have a very large sale as soon as his machine becomes known, and this is a matter of judicious advertisement.

Dingwall.

ANNO DOMINI.

SUMMARY OF CORRESPONDENCE.

Mr. J. E. S. Lockwood writes to say that on March 22nd he received a specification of an invention relating to aeroplanes, but the envelope was torn and the letter apparently lost. He has no knowledge of the sender, but believes him to be a reader of *The Motor Cycle*.

BOOKS FOR MOTOR CYCLISTS

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QUESTIONS AND REPLIES

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C.4, and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

A Three-wheeler.

? To obtain protection in bad weather, I am thinking of making a runabout of an old 6 h.p. A.J.S. Could you tell me what objection there is to one wheel at the front, centre steering, and two at the back? I should like to know if it would be bad for cornering, steering, or speed.—W.J.W.

The idea has been carried out by several people. The only objection is that the vehicle is naturally rather light in front. The front wheel is apt to bounce, and it is rather difficult to keep it rigid. It would probably also be rather awkward to steer at speed.

Exhaust Pipe gets Red Hot.

? I have a 4½ h.p. Singer motor cycle. The cylinder has been recently rehored. The timing seems to be correct, but what is troubling me is the flame coming through the exhaust pipe and silencer, making them red hot after a few minutes' running. It starts up quite easily and runs very well on half petrol and half benzole. If you can tell me the best way to get over this difficulty I shall be greatly obliged.—H.L.

Evidently you are running on an incorrect mixture; possibly it is rather too weak. A weak exhaust valve spring causing the exhaust valve to close late might also cause this trouble. A third likely cause is that you are running with the ignition too far retarded.

Adjusting a Gear.

? (1.) In adjusting the clutch spring of the N.S.U. gear, how is it possible to tell exactly how tightly to adjust the spring, which is a new one? (2.) Ought the nut for adjusting the tension of the spring to be screwed right home, or just as far as is necessary? If the latter, what prevents the nut from unscrewing? (3.) As I am assembling the complete gear parts myself, how would you advise dealing with the clutch? (4.) When the clutch is in, the high gear is in position, and when right out the low gear is working. Will you please explain how this can be, as when the clutch is out, what connection has the axle to the pulley? So far as I can see, the engine must run free.—H.W.S.A.

(1.) You will have to test the adjustment of the clutch spring by experimenting until you get it right. (2 and 3.) The nut should be screwed right home. The pressure of the spring prevents it from unscrewing. (4.) The high gear is in

position when the middle clutch cone is in contact with the female clutch cone on the planet wheel carrier, and the free engine is available when the male clutch cone is withdrawn by means of the clutch fork. The low gear is obtained by holding the sun wheel through the inner and outer clutch discs.

The Nodon Valve.

? I should be very glad if you would give me a few particulars as regards the Nodon valve for alternating currents. (1.) What quantity and strength of phosphate of soda solution? (2.) Size of aluminium and lead plates? (3.) The more suitable voltage to use: 200 or 50 (I have both available)? (4.) Is the apparatus suitable for charging accumulators, say, up to 8 volts 60 ampere hours?—W.E.F.

(1.) The phosphate solution should always be a saturated one—that is, the water should be allowed to take up as much phosphate as it will. The quantity depends on the size of the jar used, and is not important. The solution, however, should not be allowed to come up higher than within 2 in. from the top of the jar. Distilled water should be used if possible, otherwise clean rainwater. (2.) The size of the plates is not material, but a size commonly used is 10 in. × 1 in. × ¼ in. for the aluminium, and 10 in. × 2 in. × ¼ in. for the lead. About 6 in. of the length will be immersed in the solution, and a current of about four amperes will pass easily. (3.) By all means use the fifty volt supply. It is about the most convenient you could have for the purpose. You will find that the rectifier will absorb from ten to twenty volts, and the remainder can be regulated with a small adjustable resistance made of 20 gauge platinoid, or similar resistance wire. The best way is to put an ammeter in the circuit, and then you know how much current is passing through your cells. (4.) Yes, the best way excepting by the use of a motor generator.



The vernier adjustment of the Rudge timing gear. The pinion has twenty-two teeth and the crank pin twenty-one serrations, which gives an adjustment on the 2 to 1 gear of less than half a degree

Overheating.

? (1.) I possess a 1914 3½ h.p. single speed Singer, which is subject to overheating. If I open the throttle when on an incline, it knocks badly. It has a 32 jet in the B. and B. carburetter. (2.) Also the oil is blown out of the crank case with some force through the hollow centre of the adjustable pulley, which hardly allows enough oil to remain in the crank case to oil the engine. (3.) About how many miles to the gallon will a 2½ h.p. Douglas do?—J.G.C.

(1 and 2.) First of all, see that the engine is quite clean of carbon deposit, that the valves are ground in, and that the springs are strong enough. Use good quality lubricating oil and a medium size jet; also see that the gear is not too high. If you look to these points, the engine should not overheat. We should hardly think that an appreciable amount of oil is lost through the crank case relief, which is through the engine-shaft. (3.) About eighty miles to the gallon.

Difficult Starting.

? I have a 1915 5-6 h.p. Rudge-Multi combination, which appears to be in perfect order. Now the only way I can start this machine when cold is by advancing the spark two-thirds, setting the throttle one-third open, the air lever closed, by covering the main air passage with a handkerchief, warming the plug, and removing the belt. I can then start the engine fairly easily with the pedal starter. Now when I replace the belt and start pedalling with the controls set as above, all I can get are loud explosions in the silencer, but I cannot start the engine. The only way I can start when warm is by running down hill and dropping the exhaust lever. I simply cannot start by means of the pedal gear or by running.—H.S.

We cannot understand why you should have to remove the belt before you can start the engine. Everything appears to be in order, and it seems that the real reason—unless there are air leaks at the carburetter or induction pipe union—is the bad quality of petrol we are getting at the present time. There will be some improvement when the weather is warmer, and a little later on better petrol will be on the market; or you might try using benzole. Try injecting a little No. 1 spirit, if you can get it, through the compression tap. If you can get the engine to fire on this it will probably continue on the No. 3 spirit.

A Loose Bush.

? Please tell me if the small bush in which the cam wheel works on a Calthorpe-Jap should be only driven in, or should the aluminium casing be heated and the bush be shrunk in, as I forced it in, and through the weight it has to bear it works loose, although I drove the bush in as tightly as I could drive it with a hammer.—J.P.

The bush should be a good driving fit in the crank case, and if the journal is an easy (but not, of course, too easy) fit it should not move. If, however, it shows a tendency to do so, it should be keyed or fastened with a set screw.

Which Jet?

? I have a $2\frac{3}{4}$ h.p. twin Royal Enfield, B. and B. carburetter. (1.) What size of jet gives best results for speed and economy of fuel with No. 1 petrol? (2.) Size of jet required for No. 3 petrol? (3.) Size of jet required for benzole? (4.) Does benzole give the same power and speed as petrol?—J.D.

(1.) Jet .027, adapter .44. (2.) Jet .029. (3.) Jet .026. (4.) Benzole gives approximately equal power and speed to petrol, but requires much more air. The running is much smoother with benzole.

Silencing a Two-stroke.

? My two-stroke machine is an excellent one, but I should very much like to make it more silent. I have made some experiments with the exhaust, and found that the only efficient method of silencing it was to close the small holes drilled in the end plates of the silencer, and fix a tin on the end of the exhaust pipe as an extra expansion chamber. But I found that as soon as I blocked up these small holes a considerable loss of power was experienced; yet without doing this, whatever else I tried, I could not get any appreciable effect. Could you suggest any method of efficient silencing without too much loss of power? I know that the freedom of exhaust has a very material effect on the running of a two-stroke engine. Either greater or less freedom causes bad running of my engine. For this reason I should like an arrangement by which I could put in and out of action the extra silencing device. This is a question which I am sure would interest many two-stroke riders. Would a large size silencer do the trick without spoiling the running? Please give me a helpful suggestion.—E.G.K.

We fear you will find it impossible more effectually to silence the machine in question. If you do, there will be so much back pressure that loss of power will be the result. A two-stroke is naturally noisy, and cannot well be satisfactorily silenced. Possibly some slight improvement might be obtained by causing your existing silencer to exhaust into a larger expansion chamber, and fitting a long extension pipe. If you fitted a cut-out between the old silencer and the new one, you would then be able to use either the old silencer or the new one, and such a cut-out would be quite legal.

The Two-stroke.

? As I am thinking of purchasing a motor cycle for occasional short week-end trips, and as I think that a two-stroke would suit my requirements, I seek your advice on the following questions: (1.) Would a two-stroke be capable of a twenty-five mile non-stop run, driving at, say, 20 m.p.h.? (2.) Would it not be liable to become overheated during summer months?—M.D.L.

(1.) Yes. (2.) No.

READERS' REPLIES.

Miniature Plugs.

I notice in your queries and replies columns (March 20th) a correspondent asking for information re model sparking plugs. In days gone by I had a great deal of experience in this direction in connection with high-speed model boats, and obtained very successful results by using the centre out of any well-made mica plug and turning it down to fit the smaller body, but there is a limit to the amount of cutting down that can be done, and on the whole it is better to design the engine so that a full-sized plug can be used. I can assure you that both ebonite and vulcanite are quite unsuitable, as, although they might start and fire quite well for a few explosions, the inner end would immediately become charred and form a short circuit. If your correspondent cares to write to me I can probably give him some helpful information in regard to small petrol engines, having been somewhat of a "pioneer" in this direction.—F. G. Arkell.

Four-stroking.

I note your reply to "E.S.R." in "Questions and Replies" in your issue of March 27th regarding two-stroke engines. I own a $2\frac{3}{4}$ h.p. Connaught, to which I fitted an extra air inlet by putting a compression tap in the induction pipe. The effect of this was to increase the speed by about five miles per hour, and almost to eliminate the "four-stroking" trouble. I am now fitting a Bowden extra air inlet valve, and anticipate a still further improvement. The recent correspondence in your columns regarding two-strokes has greatly interested me, and, having owned three within the past four years, I am convinced that the Connaught, Levis, and Triumph two-strokes are far superior in speed, hill-climbing, and comfort, to the various four-stroke lightweight motor cycles at present on the market. I feel sure that the twin two-stroke has a great future when it is perfected, and look forward to the proposed Levis and Connaught horizontal twins.—NORMAN AISH.

Oil Slinging and Loss of Power.

Referring to "G.H.A.'s" enquiry in *The Motor Cycle* of the 15th March, I think my recent experience and remedy may be of help to him and others in similar difficulty. I recently had occasion to fit a new piston to my King Dick engine, and found, on warming up to the work, it suddenly lost power, then regained, and finally lost it, so much as to peter out entirely accompanied by

much slinging of oil past the mainshaft, on pulley side, smothering the belt with oil, and causing the latter to slip badly. Dismantling the engine, I found the top ring partially seized, and signs of gas blowing past the rings. I carefully prised the ring out of the groove, cleared out the carbon, rubbed the ring down on emery-cloth (a new piece of very fine grain) on a perfectly flat surface, and refitted. Result: Perfect compression and sweet running! I have no doubt the blowing past the rings caused much of the excessive oil-slinging, assisted by the absence of the felt washer between the crank case and bearing on the pulley side, which had been chewed up through my having to leave out the steel washer when fitting a new bearing some time ago. So I cut out a thin leather washer to replace it, and, the bearing being now bedded home, I have replaced the steel washer, and all seems to be going well. But why is felt used instead of leather? Is not the latter more enduring? I regularly take *The Motor Cycle*, and glean many useful tips from it. I am much interested in benzole, and have proved that, by using three parts of benzole with one of war spirit, the m.p.g. with sidecar has increased from 50-55 m.p.g. with war spirit to 80 m.p.g. with the benzole mixture; and, with the aid of a Euk quick starter, I can get the engine to fire most times with the first kick of the starter, except on frosty mornings, when a teacupful of boiling water over the induction pipe does the trick.—W. KRINGER.

RECOMMENDED ROUTES.

SUTTON-IN-ASHFIELD TO SKEGNESS.—H.W. Sutton-in-Ashfield, Mansfield, Newark, Leadenham, Sleaford, Tattershall, Spilsby, Wainfleet, Skegness.

REDDITCH TO RHYL.—G.I. Redditch, Bromsgrove, Kidderminster, Bridgnorth, Wellington, Whitechurch, Wrexham, Mold, Trefnant, St. Asaph, Rhyl.

LONDON TO DUDLEY.—R.S.I. London, Edgware, Watford, Berkhamsted, Tring, Aylesbury, Bicester, Aynho, Banbury, Stratford-on-Avon, Alcester, Headless Cross, Bromsgrove, Halesowen, Dudley.

BRISTOL TO TUNBRIDGE WELLS.—J.N. Bristol, Bath, Bradford, Devizes, Upavon, Andover, Basingstoke, Farnham, Guildford, Dorking, Reigate, Redhill, Sevenoaks, Tonbridge, Tunbridge Wells.

BIRMINGHAM TO WESTON.—T.H.W. Birmingham, Alcester, Evesham, Tewkesbury, Gloucester, Stone, Alverston, turn right at Filton where trams are met, cross Clifton Downs, down to River Avon, over Ashton Swing Bridge, Congresbury, Weston-super-Mare.

WOLDINGHAM TO SWANSEA.—A.E.H. Woldingham, Purley, Sutton, Surbiton, Hampton Court, Staines, Ascot, Wokingham, Reading, Pangbourne, Stratley, Wantage, Faringdon, Lechlade, Cirencester, Gloucester, Lydney, Chepstow, Newport, Cardiff, Bridgend, Aberavon, Swansea.

PETROL AND OIL.*

HOW THEY ARE TREATED.

THERE is a vast difference between petroleum as it flows from the earth and its derivatives. Between the crude and finished products there is the oil refinery, a region of giant stills, filters, storage tanks, steam and power plants, coal bunkers, and laboratories with their attendant staffs.

Crude oils are not simple chemical compounds, but consist of a physical mixture of different compounds of the element carbon and the element hydrogen. Other elements such as sulphur, oxygen, and nitrogen, various metallic salts, and other impurities are present. Each one of these many compounds has its own definite physical properties, such as fixed boiling point, specific gravity, and other specially distinguishing characteristics.

Hundreds of different hydrocarbon compounds lying between the extreme limits of petrol and the heaviest oil are separated from crude oil by fractional distillation. These products are divided into many different grades, according to their physical and chemical characteristics, and to the purpose for which they are used and shipped to all parts of the world, wherever an internal combustion engine is used, a lamp burned, or a wheel turned.

Crude Oils.

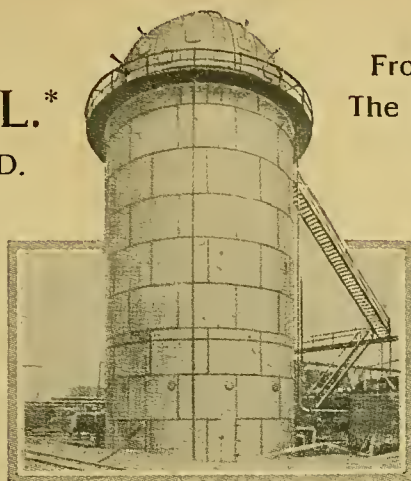
Crude oils may be divided into three main families—those of paraffin, asphaltic, and cyclo-naphthalene bases. There is no sharp line of demarcation between these groups, since most crude oils found in all fields may contain mixtures in variable percentages of hydrocarbons belonging to two or more families.

The crude petroleum is carried from the wells to the refinery by a pipe line. On its arrival it is stored in tanks of large capacity, and a certain settlement takes place. The semi-solids which settle out consist of amorphous paraffin wax, mud, and other earthy foreign matter.

Separation into Groups by Distillation.

From the storage tanks the crude oil is pumped into a large cylindrical boiler called a "crude still." Distillation, as applied to oils, is the separation of the more volatile portions by vaporisation, and their later condensation by passing the hot vapour through a cooled tube. Light hydrocarbons like petrol vaporise very readily, whereas heavy oils form practically no vapours at atmospheric pressure and temperature; therefore, it is necessary to heat and boil crude petroleum in a closed vessel in order to accomplish complete vaporisation and separation of the different hydrocarbons. Since crude oil is a complex mixture of hydrocarbons,

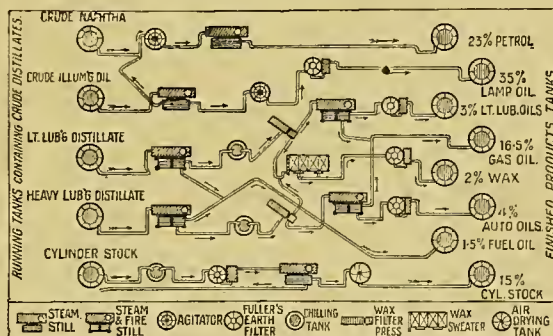
* From "The Story of Petroleum," by C. W. Stratford (an engineer connected with a large oil refining company in America, which appeared in *Popular Science Monthly*, to which magazine acknowledgment is made).



The agitator—a lead-lined tower for bleaching oil and removing impurities.

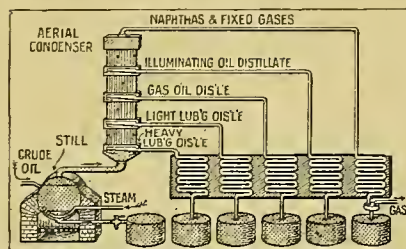
each of which has a different boiling point, a different temperature is required for the vaporisation of each compound. Dissolved gas and the lightest hydrocarbons pass over first, and as the temperature is increased heavier and heavier hydrocarbons are vaporised.

The lower diagram is intended to show how the vapours are led through a pipe from the still and discharged into the base of the aerial tower condenser. From there



How Pennsylvania crude oil is refined.

they pass up through alternate boxes and air-cooled tubes, where products of different boiling points are condensed and then automatically separated into groups. The lightest products pass completely through the tower, and flow, in vapour form, to a water-cooled condensing coil, where all light hydrocarbons condensable without the application of pressure are liquefied and separated from



First separation of crude oil into groups by distillation.

From Crude Oil to Motor Spirit. The Methods of Distillation and the By-products Obtained.

the remaining vapours, which are further treated at a compressor plant for the separation of very light hydrocarbons from the "fixed" gases.

Of the remaining vapours the heaviest condense upon striking the first air-cooled tube, and the lightest upon striking the last tube. Intermediate products, lying between the light and the heavy ends, condense in the intermediate tubes, depending upon their respective boiling points.

The vapours liquefying in different sections of the aerial condenser fall back into corresponding collector pans, whence each is led by way of a separate water-cooled coil to the storage tanks called "running tanks." The liquids recovered in the collector pans are still at the temperature above their flash points, and it is necessary to cool them down to prevent spontaneous ignition, when they come in contact with air in the running tanks.

Distillation continues until a residue (crude cylinder stock as it is termed) of about 15% remains, when the fires are drawn and the remaining oil is pumped from the still through a cooler into a running tank.

The quantity and quality of products obtained from this first separation depend upon the method of distillation employed and from the base or "family" to which the crude petroleum belongs. This description, however, only concerns Pennsylvania crude oil of paraffin base.

High quality oils are obtained when the separation is made by distilling under vacuum or by the use of fire in combination with steam injection. Due to the mixture of oil and water vapours in fire and steam distillation, oil vapours pass over at lower temperatures than when fire is used

alone. This prevents the occurrence of any serious "cracking" of the heavy products.

Separation and Finishing of First Groups.

The first object of subjecting the group-distillates from the running tanks to different processes is further to separate each group into the final market form of the many groups contained. The second purpose of refining is to remove the impurities, colour bearing, and unstable or unsaturated compounds and free carbon. It may be well to point out at this time that in the first group distillation there is no sharp line of demarcation between petrol and illuminating oil or between any other similar fractions. Heavy constituents are mechanically carried over with the light portions, and more volatile products are mixed with the heavy parts. In order completely to separate these further distillation is necessary.

The crude naphtha distillate is pumped from the running tank to an agitator,

Petro. and Oil.—

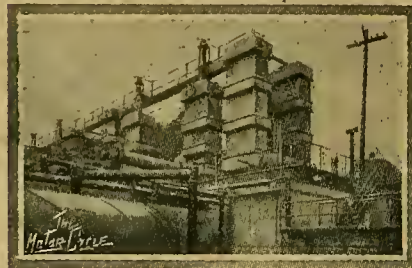
where it is heated with sulphuric acid, washed with water to remove the free acid and neutralised with caustic soda, again washed and separated from the water. The heated naphtha is next sent to a steam still, where it is divided by distillation into various market grades of petrol, and pumped from there to the finished naphtha storage tanks.

The illuminating oil distillate is pumped to a steam still, where the crude naphtha contained is separated by distillation and sent to the crude naphtha still. The illuminating oil remaining is sent to an agitator, where it is acid-treated, washed, neutralised, re-washed and filtered through fuller's earth, and pumped to the finished lamp oil storage tanks.

The crude light lubricating oil distillate passes from the running tank to a steam and fire still, for the purpose of changing (by heat) the character of the paraffin wax from the amorphous condition to wax that may be crystallised and for separating the fuel oil content. The lubricating distillate then goes to a chilling tank, where its temperature is lowered to such a degree as to cause

crystallisation of the wax. In this chilled condition it is then pumped to a wax filter press, under high pressure, where it is separated into crude scale wax and pressed lubricating distillate. The latter then goes to a steam and fire still, where the gas oil is separated from it. The remaining distillate is then divided into lubricating oils of different viscosity, varying from very light to medium light, by fractional distillation.

The oils of different viscosities resulting from this fractional distillation are



Aerial condensers for automatically condensing different distillates.

next sent to a fuller's earth filter, through which it passes to the finished paraffin wax tanks.

The crude heavy lubricating distillate follows the same course in processing as that indicated for the light distillate. Fuel oil and paraffin wax are separated in the same manner. The fractional distillation of the remaining oil results in lubricating oils of heavier body than those recovered by the processing of the light lubricating distillate.

Crude cylinder stock is greatly thinned with naphtha, and then sent to a chilling tank, where the paraffin wax, from which vaseline is made, settles out. The oil naphtha portion is pumped to a fuller's earth filter for the removal of colour-bearing compounds and free carbon. From this filter it passes on to a steam still, where it is separated into naphtha and low cold cylinder stock. From the still the oil is sent to a tank, where it is blown with air to remove traces of moisture, and then to the finished oil storage tanks.

Thus are made some of the "oils" with which most motor cyclists are acquainted. It will be seen that petrol is only one of the products of an oil refinery.

RUNNING ON "SOLID" FUEL

An Ingenious Conversion utilising Solid Naphthalene as Fuel.

MENTION has been made on several occasions in *The Motor Cycle* of the possibilities of running a motor cycle on solid fuel. Although we do not anticipate that motor cyclists will discard petrol, now that it is available, in favour of naphthalene moth balls, it is interesting to know that such fuel can be used to propel a motor cycle.

During the petrol shortage in 1917 and 1918, Messrs. Olivos Motors, of Acton, converted a Triumph to run on this fuel; but, since the results obtained were not so good as with petrol, and the cost considerably higher, it is not anticipated that other readers of *The Motor Cycle*

will follow the plan of the inventors of the device which we illustrate.

The machine is fitted with a wooden "tank" of considerable width, the left-hand side of which contains the petrol and oil tanks, while the right-hand compartment is arranged to carry the moth balls. In the lid is a door through which the driver can feed the moth balls into the partition immediately above the vaporiser—a procedure which is necessary every ten or fifteen miles.

The machine is first of all started on petrol, but, of course, a blow-lamp could be used to melt the naphthalene if desired. Five minutes after the engine has been running on petrol there are symptoms of choking and eight-stroking, when the petrol may be turned off and the rider can continue on the solid fuel.

There is no carburettor proper, the petrol being introduced into the induction pipe between the naphthalene chamber and the gas throttle, any excess running into the hot air pipe.

The power developed from naphthalene is about equal to that of coal gas, about 75% of that of petrol.

The vaporiser contains about half a pound of naphthalene, and as the approximate cost of running on this fuel is 6s. 9d. per eighty miles, it will be seen that it is not by any means a cheap fuel.

The accompanying drawing gives a pretty clear idea of the naphthalene vaporiser and renders it self-explanatory. It will be seen that the principle involved is to melt the naphthalene by means of heat from the exhaust. When the fuel has been reduced to a liquid state, hot air drawn through the air pipe bubbles through it in much the same way that air bubbles through the old type surface carburettor. Curiously enough, in

running on this fuel it is found beneficial to control by the air lever. There is plenty of carbon deposit while using naphthalene, but no knocking—the latter only developing when petrol is used.

As will be seen from the illustration on this page, the lagging of asbestos string by no means improves the appearance. However, as a temporary measure, it was distinctly better than having no fuel.

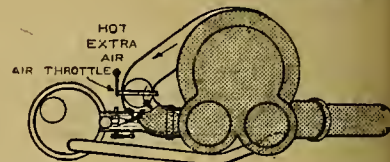
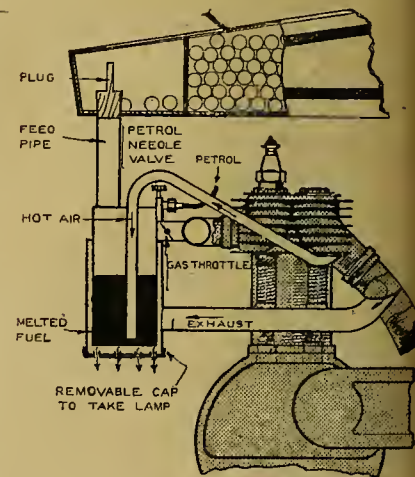
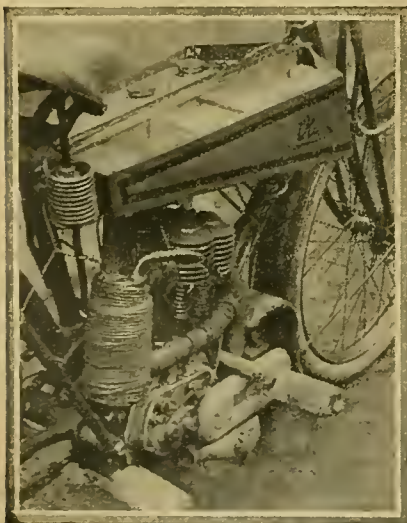


Diagram of the arrangement for storing and melting the fuel.



View of the conversion much camouflaged by lagging.

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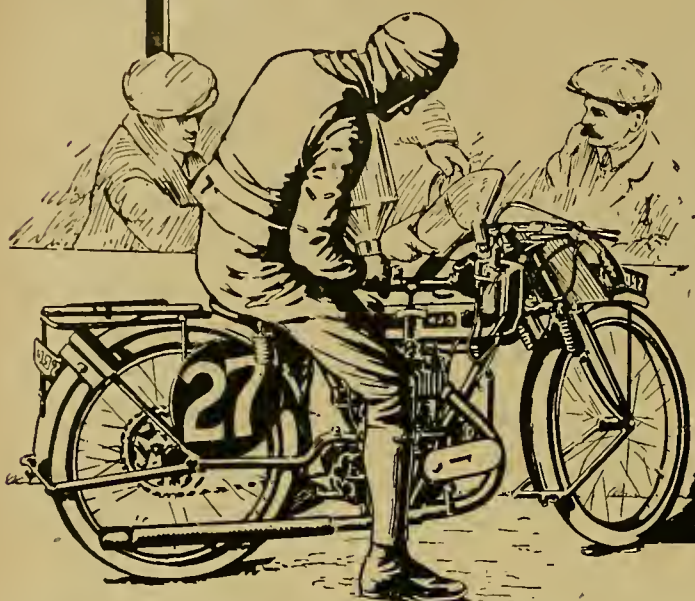
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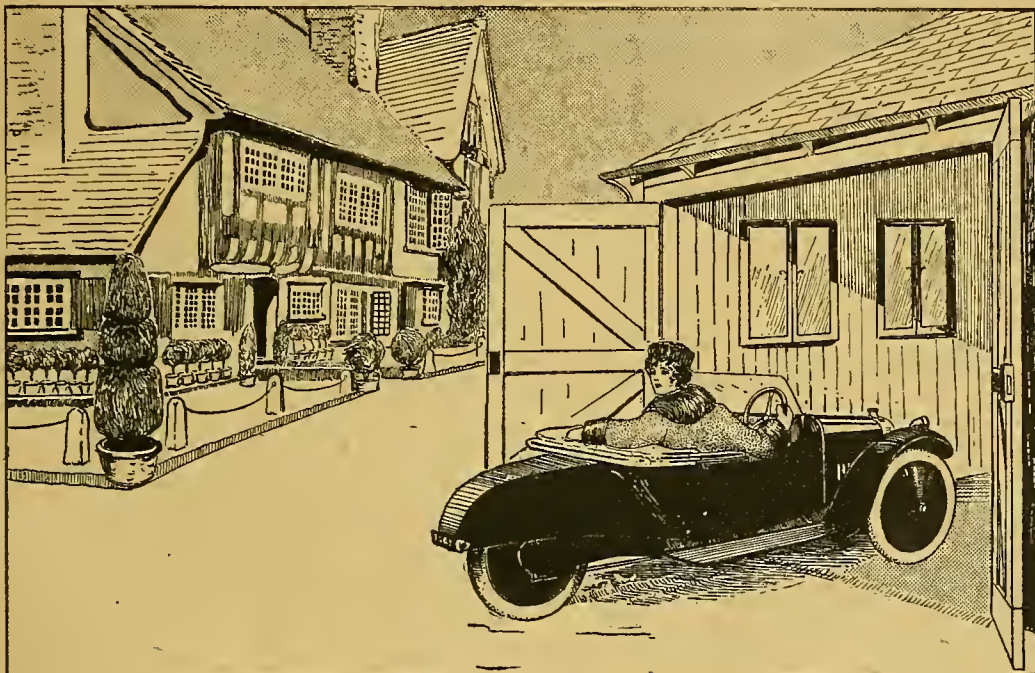
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The Import of Foreign Motor Cycles.

IN our issues for the 10th and 17th inst., we gave exclusive forecasts regarding the decision of the Government concerning the importation of foreign motor cycles. These forecasts were founded upon such reliable information that they have proved to be entirely accurate, and we are now able to announce that the prohibition on imports is to be withdrawn and importation restricted to fifty per cent. of 1913 imports until September 1st this year.

The announcement of the Board of Trade on this matter states also that the importation of forgings and castings for motor vehicles is to be similarly restricted. In both cases licences will be issued in proportionate monthly quantities, but in the case of spare parts for renewal purposes for machines already on the road, these are to be admitted freely under licence. The prohibition on motor scooters is to be maintained.

The wording of the official statement is somewhat ambiguous, and there appears some uncertainty in connection with what is meant exactly by a paragraph which refers to the licensing in proportionate monthly quantities. If a certain firm imported 1,200 motor cycles in 1913, presumably this concern may import fifty per cent. of five-twelfths of this number (i.e., 250 motor cycles) between April 1st and August 31st this year. Government announcements are often obscure, and it is possible that a supplementary explanatory notice may be eventually issued by the Department of Import Restrictions of the Board of Trade.

Although no mention has been made of the duty to be paid on motor vehicles coming into this country under these regulations, it is safe to assume that this will remain at 33⅓% until that figure is amended by Act of Parliament.

So far as British manufacturers are concerned, the limited imports, especially if the duty be retained, cannot have any serious effect upon their business, except, perhaps, that the removal

of the prohibition may tend to accelerate outputs all round, in order to be fully ready for a possible removal of the restrictions in September. The possibility of even a limited number of imported machines being available in this country in the near future will go a small way toward alleviating the present shortage of motor cycles.

Sales of Army Motor Cycles in the Provinces.

WE have several times urged that it would only be fair to the taxpayer generally, and motor cyclists in particular, if the Government could see its way to hold some of the forthcoming sales of surplus Government property in provincial centres as well as in London. We return to this subject, as it is a question which a large section of the public is asking, and therefore it is one to which the Department concerned should give immediate attention.

There is a feeling in the provinces that London buyers only are to be given the opportunity to purchase the surplus stock for which provincial taxpayers have paid just as heavily as those residing in the London area, and we think that the former should be given convenient facilities for examining surplus Government motor vehicles, and, incidentally, participating in the bidding for the machines.

Buildings as suitable as the Royal Agricultural Hall are to be found in most provincial cities, such as Birmingham, Bristol, Glasgow, Liverpool, Leeds, Manchester, Nottingham, etc., and there is no doubt that the amounts realised would in every way be equal or even superior to those obtainable from London buyers.

Probably there are certain difficulties in connection with the transportation of the goods, but even for London sales the machines have to be loaded at the depots and unloaded at the sale-rooms, and to carry out sales in the provinces would only mean that the distance between the two would be slightly longer.

Occasional Comments by "Ixion"



3½ h.p. Single-cylinder Two-strokes Coming?

I HEAR by a side wind that the advance registered in air-cooling during the war has rendered a satisfactory 500 c.c. single-cylinder two-stroke practicable, though I have no definite information that one is to be put on the market. Readers will remember that in the old days a 350 c.c. two-stroke was about the outside edge of the absolute limit for air-cooling, and that some of these were easily tempted to melt their sparking plugs or parboil their top rings, so that A. A. Scott had to branch off into twins and fit a radiator when he needed plenty of kick from this type of engine. If such an engine materialises, it should be a cheap production job, well-suited to the popular machine of which I have already written.

Prejudice and Propaganda.

QUITE a pathetic little note just to hand from New Zealand. My unknown friend has booked a British flat twin for 1919—note well, ye traders, not because he really wants one, but because his favourite Indian is now quoted at £135 in his township. Consequent on the placing of this order he has just received a back number of *The Motor Cycle* in which some correspondent remarks that flat twins are noisy, inflexible, give a lot of trouble, require frequent gear changes, and collect tons of mud. So my correspondent is in the dumps, and is on the verge of selling an extra 100 sheep and buying an Indian after all.

Of course these two sad cases—i.e., the New Zealander and the critic who has put the wind up him—are really subjects for the attention of Mr. H. A. L. Fisher, Minister for Education, and not for a mere motor cycling scribe. However, when the great neglect their duties, the mean man must step in. Let us analyse the statements, and it will be clear that the critic ought to have known he was talking through his hat, whilst my N.Z. friend should surely have spotted it also. Item one—"flat twins are noisy." All motor cycles are noisy, but in any class, e.g., the 500 c.c., the flat twin is necessarily the quietest, for each of its barks is a 250 c.c. bark, as compared with the 500 c.c. barks of a single: and as compared with a 500 c.c. V twin, its barks are even instead of being irregular. Item two—"flat twins are inflexible." The exact accusation cannot be identified, but presumably our authority has committed the grievous crime of tautology, and means they require frequent gear changes. After twenty years of motoring everybody is supposed to know that there are two main types of petrol engine—low speed and high speed. The high speed type wants a lot of gear lever, the low speed type does not want quite so much. Both are grossly "inflexible," as compared with a steam engine, which does not want any gear lever at all. The critic presumably means that a flat twin wants more gear lever than a V or a single of the same c.c. This is not true as it stands. The 2¾ h.p. Douglas went

through an End-to-end trial some years ago on less gear lever than most of the 3½ h.p. singles engaged. It is true that the average modern flat twin wants a lot of gear-lever, the reason being that the beautiful balance of these engines permits them to be revved up to 4,000 r.p.m., whereas if you tried such stunts with a single or a V twin, the carrier would twist round and smash the head lamp.

The Indictment Continued.

I TEM three—flat twins give a lot of trouble. Tut, tut, gentlemen. Surely even a 6¼ hat knows that the flat twin is by now as much an established type as the vertical and the V. Well, if a type is good enough to survive in open competition, you may take it that the trouble it gives is dependent, not on the peculiarities of the type, but on the design, material, and workmanship embodied in any given sample. If a type is inferior, its number is up. Tube ignition vanished—because it was a bad type. Accumulator ignition vanished—because it was a bad type. The magneto survived—because it was a good type. The flat twin made its *début* when the vertical and V were established, and cut into their annual sales to the tune of 25,000 machines because it was a good type. But you cannot generalise about all the different makes. I have had flat twins which never gave any trouble, and I have had others which gave nothing else. It is just like marrying a wife or buying an ounce of baccy—you must exercise judgment in selection. Item four—flat twins collect a lot of mud. What is the animus here? I suppose our anonymous critic means that if you buy, e.g., a Triumph, the bottom of its crank case is in the line of mudfire and is easy to clean; but that if you buy a flat twin, its cylinders field the flying "clarts" (as the Durham boys call them), and cylinders are not easy to clean. Well, this might be true if flat twins kept their cylinders where the Triumph keeps its crank case, but they do not. As a rule the cylinders of a flat twin are mounted pretty high up, and the machine has a front mudguard of sorts. Oh! dear. I can pardon a man for writing reams of glib nonsense—I am by no means guiltless myself; but it is just the absence of that analytic mental quality which recognises hot air as hot air that has established the Soviets in Russia. Do not let it invade motor cycle politics, please.

Wanted, a Ford Motor Bicycle.

AT the present moment the ranks of the less well-to-do motor cyclists are full of bitterness and disappointment. My postbag threatens to ignite His Majesty's mails, so warm are the letters of complaint which it contains. During 1919 it will probably be impossible to obtain a sensible touring machine at less than £80, and there is not one symptom of any change in 1920, unless supply overtakes demand, and with the cessation of much very natural profiteering-second-hand machines of pre-war

Occasional Comments.—

and war origin slump down to their intrinsic values. Will somebody please do for the motor cycle what Ford did for the car, *i.e.*, concentrate all the energies of first-class design and first-class production methods to evolve a roadworthy mount at a minimum price? I am glad enough to welcome all the refined four-speed machines with electric lighting and other luxuries. In the public interest I could spare the lot if some genius would produce a simple, sound touring machine at £25 or even at £40. I should be apprehensive if a £50 car appeared—there is not safe room on our present roads for the millions which would sell. But, given certain rational stipulations prior to the issue of driving licences, our roads would accommodate illimitable numbers of motor bicycles.

How to Cheapen the Motor Cycle.

THERE are three ways of cheapening our machines. Output is the first. Design is the second. Scientific manufacture is the third. The middle item is the culprit behind high prices. Nobody has ever planned mass production of a single specification designed from stem to stern in the interests of economy. The most superficial examination of our motor cycles betrays two facts about them as a class. Not all of them are "designed" in any real sense of the word. Not one of them is designed with an eye to minimum price. A single-cylinder two-stroke engine of about 400 c.c. and a two-speed gear of the simplest character are prime essentials in the £25 motor bicycle. Steel pressings must obviously replace all the innumerable lugs and bolts and hand jobs with which all existing machines bristle. The wheels must—probably—be single discs spun over a rim. The tank, gear box, and crank case must be integral with the frame pressing, and so forth. This job will tax the brainiest engineer in the country—it is a far tougher problem than the production of a £50 car, Ford's newest stunt, for you cannot save weight of material or reduce the number of parts, or cut down dimensions. It can be done, and it will be done. If

it is done quickly it will be a *political* achievement of the first water, and the doer will deserve a peerage. At present the wealthier amongst us scour out the cobwebs from our brainpans at week-ends by a trip to the sea, or a couple of rounds of golf or a jaunt in a car. The poorer among us—who contract *more* cobwebs—have no relaxation but a few hours on the allotment, or in a cinema, or at a league gladiatorial show: and such recipes are inefficient.

Gyroscopic Action of Transverse Flywheel.

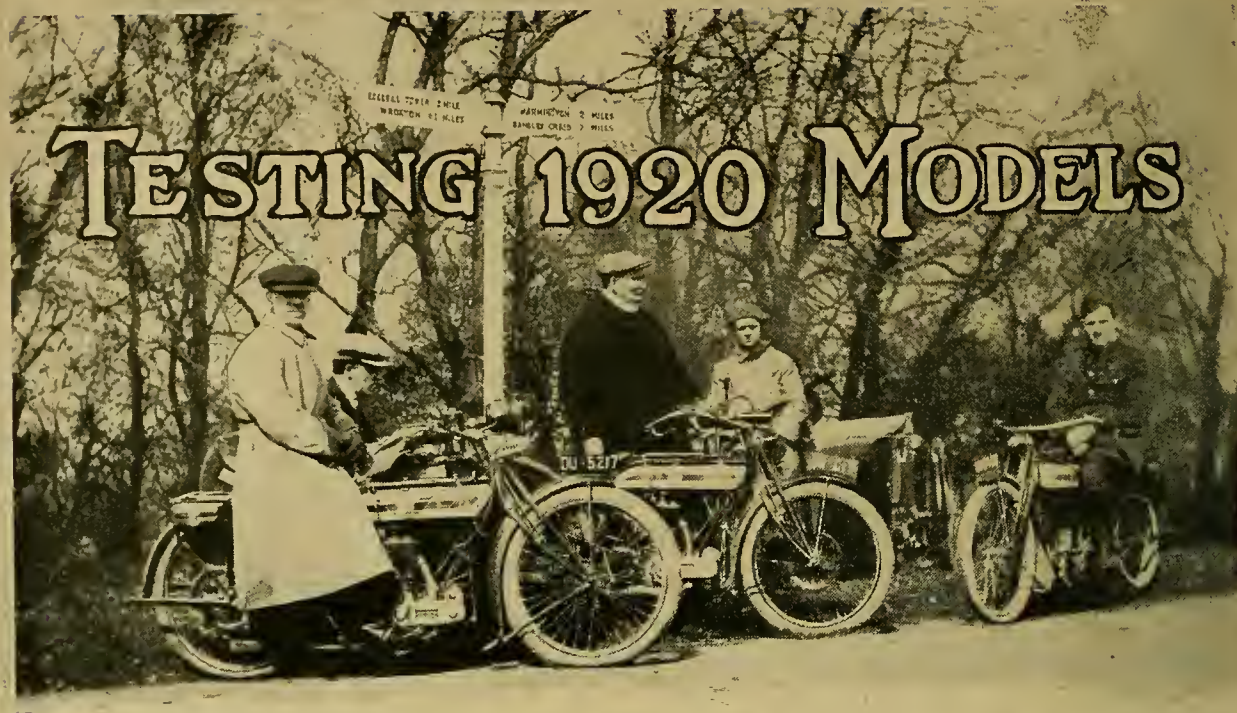
I SEE one of our correspondents has resurrected the old bogey of a flywheel rotating at right angles to the track, pinning a machine to the straight-ahead path and obstructing turns. It may be perfectly true that the writer's four-cylinder F.N. dislikes a sharp turn at an engine speed of 6,000 r.p.m. or so, but it would take a great deal to convince me that gyroscopic action of the flywheel is a perceptible factor in this reluctance. After all, racing cars with heavy flywheels spinning at very high speeds manage some fairly abrupt corner work. Anyhow, I have now had a chance of trying the 3 h.p. A.B.C., and cannot detect the least reluctance on its part to take a sharp bend at speed.

A Problem for Readers.

THIS is a tale of an awkward diagnosis with which a tourist faced a roadside repair shop on the stand and deliver lines. The tourist teetered up to the big glass doors with the engine purring like a large tomcat after its third fresh herring. As the rider cut out the engine, the machine kind of baulked. The manager sauntered out into the road, and the rider explained that the machine would run perfectly when once started; that it was uncommonly hard to start; and that it pulled up very suddenly, almost as if it had seized, whenever the engine was cut out. The garage staff and one or two interested riders tested the machine on the road, and found it was even as the rider had said. What was the matter with it? The machine was a Douglas, and I hold up the solution for readers to show us what they can do.



Competitors at the start of the Manchester club's recent speed-judging competition. This well-contested trial took place over a course of twenty-five miles. The motor cycles shown include a Douglas, Levis, Triumph, and Indian.



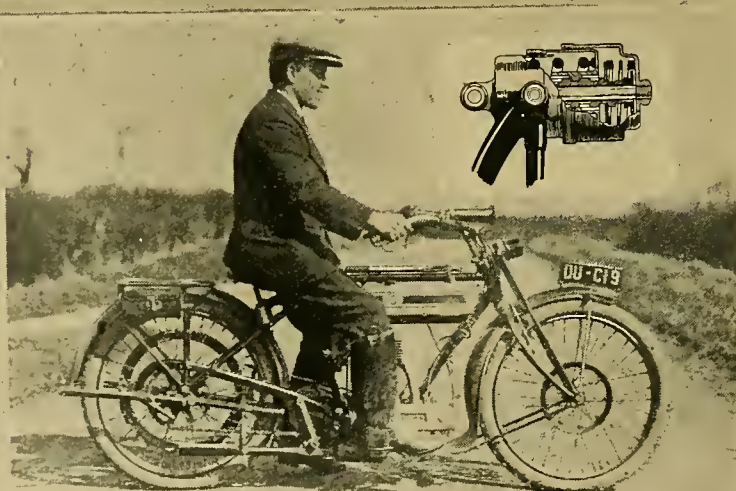
The sidecars and solo mounts used for the demonstration. Reading from left to right, Messrs. F. Hulbert and G. E. Stanley, Mr. M. J. Schulte, Mr. T. C. Pearson, and the Editor of *The Motor Cycle*.

WHILST some manufacturers are hustling to produce their present year's designs, it is surely something extraordinary to have 1920 models on the road. Naturally, the motor cycles to which we refer are but forerunners of the new design, but the fact of their being ready at this stage affords another instance of the jealous care with which leading manufacturers guard their good name. Too much secrecy in the past has prevented motor cyclists appreciating to the full with what caution and thoroughness any new feature or design is tested under all conditions, months before it is intended to be offered to the ordinary public. Reputations are not made in a month or a year, but they can be dashed to the winds by one outstanding error. It was the luck of but few manufacturers to emerge from the war ready or nearly ready to continue their staple trade. Douglas, P. and M., Triumph, Clyno, and Sunbeam, by reason of

their motor cycles having been selected by one or other of the Allied Governments, were in that fortunate position—were it not so, the dearth of new motor cycles would be more pronounced to-day than actually is the case.

New Models under Test Again.

The incidence of the war broke a spell of spring-time tests which we of *The Motor Cycle* were in the habit of making each year, but happily, these exhibitions of road-worthiness have now been renewed—instance the trials of the new A.B.C. and the modern Rex referred to in recent issues. Our present notes refer to Triumph products, the company having invited the writer to complete a quartet of motor cyclists on hill-climbing bent. The machines were rather a mixed lot. Two had Triumph three-speed gear boxes and sidecar attachments, one was an all-chain-driven solo mount



G. E. Stanley astride the 1920 model chain-driven Triumph. This machine is fitted with the new type spring fork (details inset) and the new Triumph three-speed gear box, in which is embodied an extremely efficient shock-absorber.

Testing 1920 Models.—

geared $4\frac{3}{4}$ to 1 on the top ratio of its three-speed gear, and the fourth machine was the simple single-gear belt-driven solo mount described in the Spring Number of this journal. The first objective was that happy hunting ground now so well known to our readers—the Edge Hill Range. The sidecars—piloted by G. E. Stanley and T. C. Pearson—formed the vanguard of the party, F. Hulbert and the writer following later on the solo mounts.

With Hot Engines.

It has come to be regarded as a classic test route in the Midlands to travel to Edge Hill at a "warm" pace and straightway make the ascent of the half-mile or more of 1 in 6 gradient. Not that failure is frequent nowadays; the test is more to determine the gear that will most satisfactorily perform the allotted task, and the speed and vim of the engine in its culminating effort on the single-figure gradient. Need we say, therefore, that every machine made light of the hill? Rather should we state the gear ratios and speed attained. The coachbuilt sidecar outfits, with their $5\frac{1}{2}$ to 1 top gears, surmounted the first portion on top, the second speed of $8\frac{1}{2}$ to 1 being more than sufficiently low for the rest of the climb, for the trusty (did we hear someone ejaculate lusty?) singles "roared"—one may justly apply the hackneyed term—over the summit at a speed of 20 to 25 m.p.h. Closely following were the two soloists

readily accepted by the engine without any exhibition of distress.

Later at Sunrising, the chief interest centred upon the ability of the single-gear mount with its $4\frac{3}{4}$ to 1 gear to pick up after rounding the hairpin bend. But there need have been no doubt on that score, notwithstanding the slow down for the corner, for its $11\frac{1}{2}$ stone rider was literally catapulted over the crest of the rise at a speed well in excess of the legal limit.

There was nothing further to be done, for Edge and Sunrising are the steepest gradients within easy reach of the City of Motors, so the trip was continued to Stratford, where, at lunch, discussion centred upon single, V, flat twins, aluminium pistons, and what not. The air was petrolic, and Hulbert and Stanley were at their best—that was worth something to a mere journalist.

1920 Features of Design.

But the reader will naturally be asking about the 1920 features! It would be exhibiting undue impatience to expect to know too much now, for examples of these new Triumphs will not be available for months yet—except, of course, the single-gear sporting mount, which, Mr. M. J. Schulte informed us, will be ready for delivery in limited numbers almost immediately. And so here is a chance for the nimble motor cyclist who looks twice, perhaps thrice, at £87 10s. for a three-speeder, and so decides to wait.

As regards the change-speeders, it is obvious from the fact that three of the four machines used on the trip had an all-chain drive that the Triumph designers—as well as their road-burners—now favour this form of transmission for passenger work.

The positive form of drive is used in conjunction with a spring drive shock absorber of remarkable



—Hulbert on the chain-driver making light work of the hill on top gear, the belt-driven mount, likewise geared $4\frac{3}{4}$ to 1, and no "change-speed," also making no mistake. By mutual consent at the hill summit the new Triumphs do rev. some! Interchange of mounts followed, but it was always the same result, easy ascents on middle gear for the sidecar mounts, and speed climbs on top for the soloists.

A Severe Test.

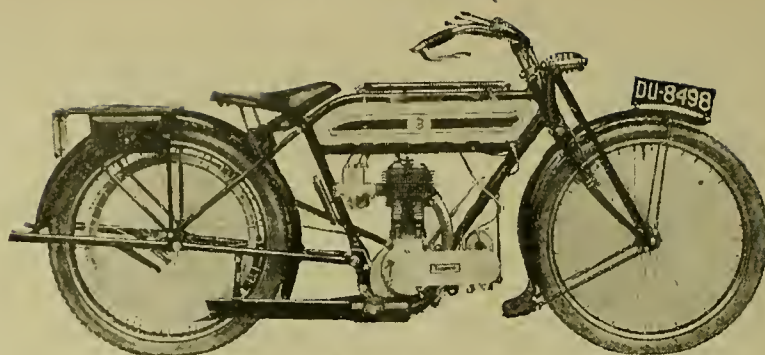
One test of the new clutch and gear was a restart on the steepest section of Edge Hill with five passengers clambered over the sidecar and luggage carrier—gross ill-treatment which was



(Top) Testing the clutch. A restart was made with five passengers on the steepest part of Edge. (Bottom) An unposed group at the crest of the hill.

efficiency, which G. E. Stanley has had under test for nearly two years. It is embodied with the countershaft clutch, the multiple plates of which are alternately phosphor bronze and steel. By means of the spring tension upon these plates, undue snatch is impossible. Take, for instance, the case of the throttle being suddenly swept open. The effect is to cause a momentary slipping of the plates, and then the drive is gradually taken up.

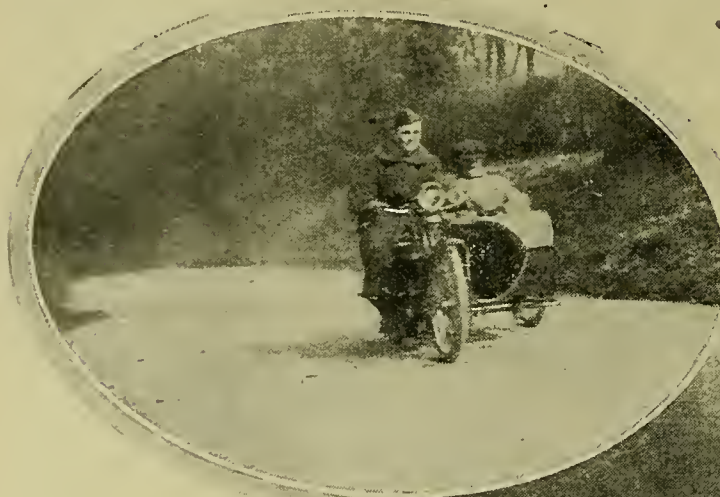
The new clutch is incorporated in the Triumph three-speed ball bearing countershaft gear box, the result of prolonged experiments. Changes can



Valve side of a new model single-gear 4 h.p. solo mount, which is announced by the Triumph Cycle Co. as being ready for delivery in limited quantities.

completely enclosed in an oiltight aluminium casing, but the rear chain is left exposed except for a guard over the upper portion, which is discernible in one of the accompanying photographs. Two of the machines were equipped with the new Triumph spring fork, which, though working on the same principle as formerly, is cushioned in its action by a coarse thread formed on the guide, which should eliminate spring breakages and all bouncing tendencies on rough roads. A neatly designed casing completely enclosing the spring enhances the general appearance.

Again, it should be added that these new designs are still undergoing extensive road tests, and buyers can hardly expect to see the perfected patterns offered as standard until Olympia. G.S.



(Top) The chain-driven sidecar ascending Edge Hill in good form.

(Bottom) F. Hulbert bringing up the new chain-driven Triumph at over 30 m.p.h.

be effected with impunity, either on the clutch or valve lifter. Novices may cheer up, for no harm will result if they forget both! In changing, although the gear




ANOTHER MIDLAND OPEN TRIAL.

THE Midland Cycling and Athletic Club is holding a big "One Day" open trial on Saturday, June 28th, in the Midland District. Three classes will be catered for—the "passenger" machine, the "solo" machine, and the "lightweight"; lightweights to include all machines up to and including 350 c.c. For each of the separate classes there will be a perpetual trophy, given by various members associated with the big Midland organisation, while for the best performance of the day a special trophy will be awarded, known as the "M.C. and A.C. trophy."

Club gold medals will, of course, be given to all competitors gaining full marks. An interesting feature of the event will be the award and special prize for the best performance on a machine of 275 c.c. or under; while other special prizes include awards for the best performance by a private owner for any class of machine, and for the best performance by a member of the club. The usual entrance fee will be charged—£1 1s. for non-members, and 10s. 6d. for members.

Entry forms may be obtained from the hon. secretary, F. J. Urry, Lionel Street, Birmingham.



OVERSEAS SECTION.

A Commentary based upon Practical Experience and a Study of Overseas Opinions.

Exports Increasing. THE tide has turned, and the number of British motor cycles exported increases month by month as manufacturers are resuming the production of motor cycles. In January, the exports in motor cycles and parts were valued at £41,301, February £114,266, and March £154,202. While not very large figures, they are decidedly encouraging, considering that the largest manufacturers are only just now commencing to deliver. The enormous demand for motor cycles in the Home country will no doubt have a retarding effect upon exports generally, but we think there are many manufacturers who will look a little further ahead than the moment and endeavour to distribute a fair share of their outputs Overseas.

Overseas Models. ALMOST every new model reviewed in *The Motor Cycle* reveals the genuine interest the manufacturers have in the

Overseas markets—if not for immediate exploitation, then for future campaigns—and it is anticipated that very few passenger outfits at next Olympia will have tyres less than 28in. x 3in. The first of the new single-cylinder sidecar machines produced for post-war trade, which was reviewed in last week's *Motor Cycle*, has a ground clearance of 5½in., 28in. x 2½in. tyres, and mechanical lubrication. It was designed throughout with full appreciation of the demands of the export trade, and no doubt many other similar models will appear during the year. 28in. x 3in. tyres are almost general now on twins of 5-6 h.p. and upwards, and it is safe to say that ninety-nine per cent. of the makers are experimenting with spring frames. The buyer of motor cycles from abroad who visits the Olympia Show in November next will, for the first time, find that the *majority* of the machines exhibited are in every way suitable for all conditions of roads.

Sidecar Bodies. OWING to the cost of freightage the price of imported sidecars in the Overseas markets is likely to be high for some time to come, and with this in mind certain American sidecar manufacturers are introducing specially designed sidecar bodies which are shipped in finished sections and assembled by the retailer abroad. Although not new, this "knock down" system, as it is called, has much to commend it at the present time, and it would well pay British firms generally to go into the matter. Packed in sections a sidecar body is very compact, and if produced by or for a firm shipping sidecar outfits, the case required for the sidecar chassis, the motor cycle, and the "knock-down" body would

be little larger than the present cases in which motor cycles only are packed.

The Machine for the Native. THERE is undoubtedly a huge business to be done by some enterprising manufacturers who will design a simple fool-proof lightweight specially for the middle-class native of countries in the East. A letter on this subject from a correspondent in India is published in this issue, from which one gathers that a high-speed would not be an essential; in fact, it is suggested that a maximum of 25 m.p.h. should not be exceeded. Such a machine would have to be cheap, light, and absolutely reliable, and leave little which is open to readjustment by natives with an inquisitive mind.

A low compression two-stroke engine with fixed ignition and low geared with belt drive would probably meet the requirements of the native rider. Ground clearance should be high and saddle position fairly low, but as cost would be the first consideration the springing would have to be provided by oversize tyres, say, 26 x 3in., and a well-sprung saddle.

In designing a machine for this special market the maker would have to dismiss from his mind past standards of refinement and finish, in which connection it must not be thought that the native intelligence is fascinated by fancy colours and a lavish display of nickel-plate. The average native of India, for example, is suspicious of a glossy finish and bright colours, and he knows insufficient of motor mechanics to judge the merits of a machine excepting upon performance. A cheap, plainly painted, plain looking, easy-to-control motor cycle, handled in a straightforward manner in the East would undoubtedly appeal to the native mind, and the firm who caters for this market in the near future will have a lucrative field to himself.

Literature in Foreign Languages. WE understand that several large manufacturers of motor cycles have in hand preparations for issuing their catalogues printed in several languages. In the past very few makers have done this, and the fact that the matter is now receiving consideration adds to the evidence that the British motor cycle industry will not be so apathetic concerning the Overseas markets, as, apparently, it has been. This enterprise should be carried a step further, and instruction books issued in various languages. Likewise any instructions, usually printed on the tank, should be in the language of the country into which it is exported.

A Selection of Letters from Readers scattered all over the World.

An Australian's Appreciation.

"MECHANIST," of the First Australian Wireless Squadron, A.I.F., writing from Bagdad, says: "Have just received your 'Peace' number, and with you and your readers am looking forward to a new era of prosperity for the 'good old hobby.' I have been a close student of your paper for nearly eight years, and can appreciate the publicity you have given to the wants of us colonials, and the encouragement you have given to the movement in general.

"On this front the 'Dugs' have done the brunt of the work, and, in my opinion, are the more suitable machines for the job. Recently only Triumphs have been issued, and have done well. The old trouble of insufficient mudguard clearance is still our bugbear with both machines. Three inches would not be too much, and would give one a chance to scrape it out every mile or so.

"With the Triumph we are continually bumping the crank case and silencer on bumps and ridges across the road, and bending the footrests. Then, in fording streams and water-holes, the 'Dug's' magneto position gives it a preference, and I have often seen Triumphs left behind to dry out the 'mag.'

"In Australia, where petrol has not yet been short, though slightly dearer than in pre-war days, the demand for machines will be very great from this on, and I trust the British manufacturer will be able to get in early, and cater for this demand, and not let his American cousin get the upper hand, as he has been threatening to do lately. The English 'jigger' is undoubtedly more economical to run, and wears better. All we want are suitable models at a reasonable price.

"The specifications of the new A.B.C. seem nearly ideal to me for solo work, provided the figure is not too high.

"Our tax in Victoria is now 10s., or, with sidecar, £1, for all powers."

Motor Cycles for the Natives of India.

MR. J. N. OLIPHANT, writing from Kheri-Lakkimpur, U.P., India, says: "I read with much interest the article in your issue of January 2nd, entitled 'Rolls-Royce and Ford Models,' chiefly in reference to the latter. I should think there would be an enormous field for the cheap quantity produced motor cycle in India, provided the requirements of the market were carefully studied. Road conditions are abominable for four-wheeled traffic (I speak particularly of Northern India) and the mileage of metalled roads extraordinarily small; but many unmetalled district roads provide quite tolerable going for a cycle or motor cycle. Travellers on foot proceeding in the traditional 'Indian file' wear out paths on the earth road surface which eventually attain the smoothness and hardness of concrete. Nothing but the rather tortuous character of these, and the fact that nobody worries to remove occasional obstructions, prevent a very fair speed being maintained.

"My job as a forest officer entails the maintenance of a large number of roads, and many of these have been brought during the last two or three years into quite decent condition for motor traffic by the simple expedient of preparing tracks on which the foot passenger is encouraged to walk. He is, fortunately, not so perverse as to pursue the usual winding course if a straight track is prepared for him. I use these roads principally in a Ford car, but knock about to a certain extent on an ancient and battered 3½ h.p. F.N. The former is better for the liver than the motor bicycle, but the latter is very long suffering. The forest staff and forest contractors are rapidly taking to push bicycles, and many of them would purchase motor bicycles if a suitable mount were available at a reasonable price. India is at present in the push bicycle phase, and no motor cycle manufacturer is going to break records as regards sales in this country unless he can produce a machine which will appeal to the Indian public—the European element hardly counts.

"The author of your article has got, in my humble opinion, very close to the requirements for a machine which would be popular here. 'Handy, reliable, foolproof,' and the greatest of these is foolproof. The Aryan brother is not gentle with machinery, and neglect would be the rule rather than the exception. Finish is a relatively minor consideration. The Indian mind would regard high finish with suspicion, as a species of camouflage. As to speed, while the Indian chauffeur often is imbued with the spirit of Jehu, I do not think it would be wise, in view of road conditions, to let

loose on the Indian public anything capable of more than, say, 25 m.p.h. The safe pace on unmetalled roads is more like 12 m.p.h. Lightness is essential for such roads. I wrestled for some time with a rather heavy 3½ h.p. machine, but it beat me. Having no experience of two-strokes, I incline to the established imperturbability of the four-stroke. Automatic lubrication, automatic carburettor, fixed ignition, and good clearance seem desirable points. A good silencer is also important in a country in which it is not unusual to look round and find the horns of an infuriated bullock toying with one's mudguard. The *patpataka*, a name onomatopoeically bestowed on the motor cycle by the villager of these parts, seems to have a peculiarly exasperating effect on horned cattle. True, many Indians would probably resent the absence of noise, and remove the silencer—that would be their affair. Two speeds are essential. I think a clutch could be dispensed with. As to drive, I have not sufficient experience of modern developments to express an opinion. The shaft drive suggested by 'Chinook' sounds attractive. As good springing as possible consistent with general sturdiness. After all, the Indian wheeled conveyance is not noted for efficiency of springs. High-tension magneto, I think. The application of the Ford type to the requirements of a lightweight would surely be difficult. I do not know if it would be too much to hope for a machine such as described to be retailed in India at a price in the neighbourhood of £20, or £25. A higher price would probably scare off a large proportion of middle-class custom."

Business Energy and Enterprise.

An ANZAC at present in London writes on the subject of the popularity of U.S. machines in Australia:

"As an Australian at present stationed in London, may I be allowed a few words on the frequently recurring subject of English and American machines for Colonial use, and, as recently pointed out in your columns, a factor that has largely influenced the sales and popularity of the American machine has been the thorough and businesslike manner in which their agencies have been conducted.

"To go back a few years to the time when the 3½ h.p. single was the goods, the English motor cycle, imported as a complete machine or locally built up of component parts, easily held the market; in fact, there never was any serious competition as to the supremacy of the British single, but when motorists commenced to enjoy and appreciate the power and pleasures of the twin we had to look elsewhere for a machine at a reasonable price, and America stepped in and filled the breach, and gave us of its best, and the price was right, too. New the twin J.A.P. was ever a warm favourite, and considerable numbers were built, and as single-gear solo and sidecar mounts achieved great success and invariably gave complete satisfaction, but with the advent of such luxuries as gear boxes, clutches, chain drive, etc., up went prices, and an English twin so equipped was worth a lot of money, but handled as a side line in sample lots it was not worth £30 to £50 more than an American, and, what is more, the Yankee made good, and now there are other considerations besides cost that influence a man to buy and ride a heavy American twin.

"With the push and go that characterise American manufacturing methods, it was plain that from the jump they were out for business, and, with the services of our best riders, took a prominent part in competitions, and in speed and reliability events soon established a firm footing, and to-day we find the American twin the popular machine both for solo and sidecar work, and whilst the British-built twin will always find a host of admirers and a few buyers, it will need a very vigorous and up-to-date policy on the part of manufacturers to popularise it amongst riders in general, and with all their energies at present devoted to supplying the home market with new old models, and waiting lists, we can hardly expect an English invasion for a year or two, and it is not much use telling a man 12,000 miles away that it will be worth waiting for.

"On different occasions during the past four years I have had many pleasant days motoring in the North of England, and undoubtedly the main roads are a treat and much superior to our roads, but the best scenery and the most interesting runs are not to be had on main routes, and it is when we get on to the side tracks that the need for stronger wheels and better springing becomes apparent."

THE COULSON "B" ON THE ROAD

A Run on a 3½ h.p. Rear-sprung Model with Outside Flywheel.

WE have already described the Coulson "B" in *The Motor Cycle*, but we may remind our readers that its principal features are its Blackburne engine, which accounts for the "B" in the title, and the system of rear springing, which consists of a pair of leaf springs anchored to the forward end of each chain stay, the ends of which are connected by links to the special rear wheel carriers hinged on to the rigid portion of the frame. The particular model tested was absolutely in the rough, and quite devoid of such refinements as first-class finish and enamelling, but it sufficed to give us an excellent impression of both the springing and the Blackburne engine, which latter was the well-tried 3½ h.p. type (85 mm. x 88 mm.), and not the 2½ h.p., which was not ready for delivery.

Over London Roads.

The machine was handed to us on a recent Saturday afternoon, which happened to coincide with the opening run of the newly-revived Public Schools M.C.C., and came in handily for attendance at that function. It was not long before we came to the conclusion that our next mount should have a spring frame and single lever carburetter. The Coulson was fitted with a Capac single lever carburetter, which was quite delightful in action, and gave all the power and acceleration which could be desired, though, owing to its being set rather finely, it rendered starting from cold rather difficult.

Esher, the rendezvous of the P.S.M.C.C. boys, was reached without incident, and then the merry crowd proceeded to Newland's Corner. Just after the start we were delayed by a choked jet; but after it had been cleared, a swift journey ensued to the famous view-point, and a fine ascent was made of the steep hill lead-



The 3½ h.p. Coulson B on which the test was made.

ing to it. The Coulson literally took hold of the gradient, and soared to the summit at a good swinging pace. A fine run was made back to the Hut.

It was very pleasing to see Clive Preen once more, who so ably performed the duties of honorary secretary up to 1914, and who arrived in the treasurer's Harley-Davidson sidecar. He has been serving as Trustee of Enemy Property in Egypt for the last three years, and has suffered considerably in health.

Testing the Rear Springing.

Our return journey from The Hut to a point some distance north of London was a most interesting one, as every variety of surface was traversed. Leaving the Portsmouth Road half-way between The Hut and Cobham, we turned to the left and struck the Weybridge Road, where the first portion has been absolutely destroyed. The machine took this rough surface, inches deep in mud and ruts, with wonderful steadiness.

People must bear in mind that it is not reasonable to expect that on a spring

frame machine the bumps will not be felt at all. It must be remembered even on a well-sprung car the road vibrations are felt, but to a lesser degree than on an unsprung vehicle. Now, in the case of the Coulson, the springing was good, and there was an absolute absence of those nerve-thrilling bumps received by the rider of an unsprung motor bicycle even if he be seated on the most comfortable saddle, and over this terrible road surface the machine was thrown about so badly that we were almost unseated.

From Weybridge through Chertsey to Staines the going was very good on the whole, though rough patches were occasionally encountered, and the ease with which the machine rode over the uneven surface was a real pleasure. From Staines we proceeded to West Drayton.

No Road!

Just outside West Drayton Station the road has disappeared altogether. The mud was inches deep, and of the pea-soup variety, while lakes many feet across abounded, and goodness knows how deep they were. Over this type of road the low gear had to be used for the first time, except for starting, and very slowly we dodged the pools of water by going round them, finally reaching dry land once again without a single dismount. Had the machine been one of the sporting single-gear type it would have involved at least several sudden dismounts in water, probably ankle deep.

Beyond Staines more interesting country was reached, and we proceeded through Harefield and Rickmansworth, where there were several hills to be climbed. Not once was a change of gear necessary, and every ascent was taken at a remarkably good speed. Finally, we finished the journey in the rain, after a long and, what on an ordinary unsprung motor bicycle would have been, a tiring run.

Our general impression of the springing of the machine, the portion we were out to test, was distinctly good.



Members of the Nottingham and District M.C.C. at the Peacock Hotel, Belvoir, on the occasion of their recent opening run.



Manchester M.C.

The official results of this club's recent speed-judging competition are as follows:

Locke (car)	Error 34s.
Lowe (Humberette)	38s.
Watson (Sunbeam)	123s.

Middlesex M.C.C.

The hon. sec. of the Middlesex M.C.C., Mr. S. A. McCarthy, Essex Lodge, 2, Nightingale Road, Lower Clapton, London, informs us that he has just returned to England after 2½ years' service in the West Indies, but is not yet demobilised. As soon as he is free he hopes to be able to revive the club.

Rochester, Chatham, and District M.C.

This new club is now well started, and the following officers have been elected: President, Mr. E. P. Leonard; vice-president, Mr. A. W. Booth; captain, Surgeon-Lt. T. P. Cooper; sub-captains, Messrs. C. J. Stockwell and G. Gill; hon. treasurer, Mr. O. J. Roots; and hon. secretary, Surgeon-Lt. S. White, 3, South Avenue, Rochester. The secretary will be pleased to hear from secretaries of clubs in Kent and Surrey with a view to arranging inter-club meets and competitions.

Sutton Coldfield and Mid-Warwickshire A.C.

The Sutton Coldfield and Mid-Warwickshire A.C. is holding a closed reliability trial on May 17th over a course of approximately fifty-five miles. The trial will include speed-judging; there will be two observed test hills, and an awkward hairpin bend. The competition will be run on extremely novel lines, and full particulars will be announced at an early date. The competition will be for motor cycles with and without sidecars only, as the course is not suitable for cars.

The entry fee will be 5s., and entries close by first post on May 13th.

Birmingham M.C.C.

The official results of the Birmingham M.C.C. speed-judging competition are announced as follows:

WINNING MEMBERS.

1. {B. Kershaw } Tied with an error of 7s.
2. {E. Kibble }
3. C. L. Whatley Error of 18s.
4. G. R. Morgan " 30s.

WINNING NON-MEMBERS.

1. — Kuhn Error of 2s.
2. G. A. Dalby " 20s.
3. — Horricks " 22s.
4. N. Stokes " 42s.

The next members' competition is fixed for May 17th and 18th to Llangollen and back. The conditions for this are such as will enable any machine from 2½ h.p. to 5 h.p. to compete on equal terms.

Future Events.

April 26.—Public Schools M.C.C. Hill-climb.

April 26. — Ystalyfera and Swansea Valley M.C.C. Hill-climb.

April 26.—N.M.C.F.U., Leeds. Run to Dick Hudson's.

April 27.—Burnley M.C.C. Run to Ingleton.

April 27.—N.M.C.F.U., Leeds. Run to The Dukeries.

April 27.—Nottingham and District M.C.C. Run to Matlock.

April 28.—Edinburgh and District M.C. Open Reliability Trial.

May 3.—Birmingham M.C.C. Social Run to Warwick.

May 3.—York and District M.C. Social Run.

May 4.—Bolton and District M.C. Reliability Trial.

May 4.—N.M.C.F.U., Sheffield. Reliability Run to Knutsford.

May 7.—York and District M.C. Slow Hill-climb, Garrowby.

May 10.—Exeter and District M.C.C. Opening Run.

May 10.—The M.C.C. Speed-judging Competition.

May 17-18.—Birmingham M.C.C. Week-end Touring Competition to Llangollen.

May 17.—Sutton Coldfield A.C. Half-day Trial.

May 17.—Woolwich, Plumstead, and District M.C.C. Open Trial for Matchless Cup.

May 21.—York and District M.C. Reliability Trial.

May 24.—Birmingham M.C.C. Social Touring Trial. Week-end to Llangollen.

June 6.—M.C.C. London - Edinburgh Run.

June 7-9.—Birmingham M.C.C. Trial to Land's End.

August.—A.C.U. Six Days Reliability Trials.

West Cumberland M.C.C.

Motor cyclists in the Workington district should communicate with Mr. F. Harrison, Moss Ghyll, Lamplugh, Cockermouth, who intends organising a new club in West Cumberland.

Woolwich, Plumstead, and District M.C.

The results of the fifty-mile non-stop trial of the above club are now issued, and are as follows: 1, T. J. Ross (4 h.p. Triumph sc.); 2, W. Jee (8 h.p. Matchless sc.); 3, F. J. Ellis (6 h.p. Matchless sc.).

Another trial to Hastings and back will take place on May 18th. The competitors will run in teams. Hon. sec., Mr. F. J. Ellis, 3, Nightingale Place, Woolwich, S.E.18.

Burnley Motor Gipsy Club.

The membership of this club increases every week. The opening run was to Blackpool on Friday last. Hon. sec., Mr. A. Leather, 90, Accrington Road, Burnley.

Carlisle (Chelsea) C. and M.C.

The dance at the Chelsea Town Hall, to inaugurate the reopening of the Carlisle Cycle and Motor Club, was a great success. The proceeds are to be devoted to the club's prize fund.

Wombwell and District M.C.C.

Although only formed a month ago, the membership of this club now exceeds thirty members. Two cups have been offered for competition. Motor cyclists in the district should communicate with the hon. sec., Mr. E. Charlesworth, Central Garage, Wombwell.

Exeter and District M.C.C.

The Exeter Club, which before the war covered a large part of Devonshire, has been resuscitated with a membership of over a hundred. A light car section has now been added for owners of three and four-wheeled vehicles of not more than 1,100 c.c. Mr. E. J. Hancock is again hon. secretary, with Mr. F. Tapley-Soper as hon. treasurer.

Motor Cycling Club.

The M.C.C. speed-judging competition will take place on Saturday, May 10th. Competitors will assemble at Hadley High Stone at 2.30 p.m. Speedometers and watches will be allowed. Competitors will have to ride twice over a course of about five miles at a set speed, and on a third round they will be allowed to nominate their own speed up to twenty miles an hour.

Liverpool M.C.

The opening run was a great success and a good augury of the future of the club. Two prizes were given for an "appearance" competition, the judging being undertaken by a trio of ladies selected from those present. This resulted in a win for Mr. C. R. West, whose mount was an A.J.S. and sidecar; and in the solo class Mr. E. H. Garwood, riding a 2½ h.p. Royal Enfield, was awarded the second prize.

The secretary, Mr. Norman Dean, has arranged for a lecture on "Benzole and its Properties," to be given by Mr. S. Henshaw, Staffs. Chemical Co. The date, which is not yet fixed, will be about the beginning of May. An open reliability trial to be run on benzole has been arranged for Whit-Monday. The hon. trials sec. is Mr. Lionel V. Barton, Shaftesbury Hotel, Liverpool.

A 50 lb. MOTOR CYCLE.

A Trial of the Latest Zephyr Auxiliary Motor.



The light weight of the Zephyr motorised bicycle will make particular appeal to ladies.

ON several occasions we have referred to the Zephyr auxiliary motor attachment for pedal cycles, which has been evolved by the London and Westminster Industrial Syndicate, 8, Victoria Street, Westminster, London, S.W.1. This interesting and ingenious little power unit has now reached the stage which will enable it to be manufactured in quantities. In the case of the final model the motive power is a two-stroke engine of about $1\frac{1}{2}$ h.p. (53 mm. \times 53 mm.) attached to a horizontal tube, the forward end of which is fixed to the seat-pillar, while the rearward end is made adjustable on the threaded extension of a pair of supplementary back forks secured on the rear wheel spindle of the bicycle. There are two sprockets between the flywheel and the crank case—one for the drive to the C.A.V. magneto, the other for a chain-driven friction pulley, which forms a part of the chief feature of the Zephyr attachment.

Hill-climbing Power.

The pulley and its sprocket are mounted in an adjustable bearing at the lower end of a swinging arm controlled by a Bowden wire from a lever on the handle-bar. An ingenious compression release on the engine is worked by an inverted lever under the left handle-bar grip, and the right-hand lever controls the front rim brake. The rear brake of the machine we tried was of the back-peddalling variety.

To start the machine the pulley control lever is raised, causing the pulley to stand clear of the belt rim on the rear wheel of the bicycle. The compression is released, the pulley control lever depressed, and the machine pedalled. On releasing the pulley and compression levers the engine fires, and the fibre-covered pulley transmits the power to the belt rim. The direction of rotation and method of mounting the pulley cause it to take an ever-increasing grip on the belt rim.

At the invitation of the makers, we journeyed to Brighton one day last week in order to try the attachment, and the long hill chosen for this purpose had a gradient of about 1 in 14.

Mr. Albert Lambourn, of the Old Mill Works, where the Zephyr is made, first climbed the hill at a good twenty miles per hour, which was quite a creditable performance; but our first attempt to emulate this failed through not maintaining the high revolutions necessary for so small an engine to give its full power. We had that morning been riding an 8 h.p. outfit, which explains our error. However, on a second attempt the Zephyr carried us up the hill in excellent style.

Re-starting on the Hill.

Probably the experienced motor cyclist is not exactly the person to try an attachment of this kind, as, unconsciously, he expects the same results as are obtained with a motor cycle, and it is only when he realises that past experience for the moment must be forgotten that he can successfully operate such a machine. One attempt to restart on the hill failed, but on a second occasion a successful start was made.

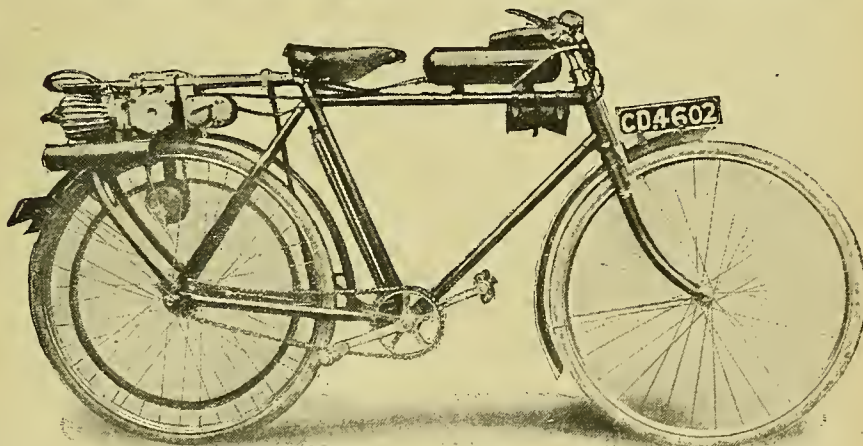
No doubt the Zephyrs will meet all the requirements of those for whom they have been designed, and will do much good missionary work among cyclists, who ultimately will become owners of higher-powered machines. Their sphere, however, is not confined to this section of the com-



The Zephyr is fitted with a stand having a long leg, which is stayed by two straps hooked on to eyelets on the near side wheel stay. When out of position it is strapped to the top tube.

munity, and we anticipate that, in this mechanical age, a large number of people will buy it for its general utilitarian conveniences. Many partially disabled men, who are physically incapable of strenuous pedalling, will also find a motorised bicycle a great assistance.

The weight of a bicycle fitted with a Zephyr attachment is about 50 lb.



The Zephyr attachment embodies a two-stroke engine of 52×52 mm. = 110 c.c. and friction transmission.

PETROL CONTROL.

IT may confidently be anticipated that the super-tax on petrol will be abandoned at an early date. So much may be taken for granted, but what concerns motor cyclists principally at the moment is to ensure that the date shall, in fact, be not unduly delayed.

It is now admitted on all sides that the object for which the Petrol Control Department was instituted has been achieved, and *The Motor Cycle* opines that the new Budget will reveal an end to its office.

The present price of petrol is 3s. 9d. per gallon, and there cannot be any

questioning the statement that this high price is having a deleterious effect on the industry, an effect perhaps not particularly obvious at the moment, but which will be more apparent as time goes on. While on the subject of motor spirit taxation, we must not forget that the original duty of 3d. per gallon on petrol was doubled in 1915. We contend most strongly that there should be an immediate reversion both to the old or a lower scale of duty and to the policy of ear-marking the money accruing from it for road improvement.

THE GREAT MARKET OVERSEAS.

Methods of British and United States Motor Cycle Makers Compared.

By Capt. B. C. WOODWARD, R.A.F., of Germiston, Transvaal.

THE question of British *versus* American productions has been the subject of much correspondence at various times in the columns of this journal, and it is only in the matter of larger wheels and tyres, plus the greater ground clearance, that the American machines have proved superior to the British for Overseas conditions. I had been a rider for many years before I mounted my one and only American machine, which was not of the spring frame variety, and the greater insulation from road shocks which that machine provided over anything previously ridden made riding on South African roads (?) an absolute pleasure. Several important manufacturers, including the Clyno, A.J.S., Matchless, Rover, Royal Ruby, and Rex, are fitting larger wheels and tyres. If road shocks can be eliminated sufficiently by these means to render rough riding comfortable to the rider, the whole machine must benefit to a similar extent, and fewer frame fractures and damaged or broken wheel rims will be found on British machines equipped in this manner.

The South African Market.

Personally I am under the impression that the average British manufacturer was so busy in catering for his growing home market before the war that he thought very little of the supply of the South African market. Certainly the number of machines which that market can absorb is small compared with Great Britain, but a small market of to-day may be a large market to-morrow, and in the three years before the war the machines on the road in South Africa more than doubled in number. The purchasing power of the population is far higher there than here at home, and in 1915 I should estimate the proportion of motor vehicles to population was one to forty persons in the three most thickly populated areas.

I have said that the market is a growing one, but a popular American machine has captured many of the new riders and not a few of the old. The credit for this is not due so much to the machine as to the methods adopted in placing it on the market. I have known a British agency be given to importers of "soft goods," and others given to firms with whom the agencies were simply "side lines." Sometimes a motor cycle before it reaches the South African market passes through several hands, to each of which some profit clings, resulting in the machines ultimately reaching the retailer at a price which compels him to sell at a figure higher than the real value of the machines, or, in order to sell at a competitive price with other machines, he has to reduce the selling price to an amount which does not leave him a fair profit. Then, again, there is the agency held by the firm which simply sits on its appointment in order to prevent some firm in opposition from becoming too keenly competitive.



Capt. B. C. Woodward, R.A.F.

There is another point which promotes the sale of the American machine, and that is the commission granted to sub-agents, which is higher than that received by them on the sale of British machines. The sub-agent is the final link in the chain of service rendered to the rider. He has the task of mothering

the machine during the most critical period of its life when it needs more care and attention than at any period, and when its rider is often least qualified to care for it at all. His work does not finish when the machine leaves his shop, but continues for a month or two after the machine has taken to the road, and in the event of defect in any part, although that part is supplied free, the sub-agent has the expense of fitting the part. He earns all he makes on the sale of an American machine, and more than he receives on the sale of a British.

The question of distribution of profits needs some attention by manufacturers generally.

The demands of the home market will tax the energies of manufacturers for some time, but there are quite a few additions to the manufacturing ranks, and this, with the large production programmes decided upon by many, will eventually compel attention to be directed towards the finding of new markets. The tendency on the part of manufacturers at present is to concentrate on the supply of home demands, presumably at the expense of the Colonies, where British machines are required just as urgently.

American productions during the past four years have not been excluded from South Africa, neither has D.O.R.A. raised her voice in prohibition of pleasure riding and restriction in the business use of motor cycles, and should the home market receive first and sole attention, further opportunity will be given American manufacturers so to strengthen their hold on the market that it will take years to establish the British motor cycle on even its pre-war footing in South Africa.

A Golden Opportunity.

British manufacturers are now making a new start in production, some with entirely new designs, others with their pre-war models embodying new features resulting from experience gained during the war. Why not redesign also the methods adopted by many in handling Colonial trade. Bring your factories, factory knowledge, and spares supplies more closely in touch with your distant riders, and give them a "service" in every way equal, or superior, to that enjoyed by riders at home. The ways and means are not hard to find, and the result, even if not great in immediate increase of business, can be obtained without expense and at no great trouble. By more up-to-date and keener business methods British goods will be placed in their correct position on British colonial markets, and the methods adopted for the supply of one market should prove equally successful on all.

CURRENT CHAT

Times to Light Lamps.

SUMMER TIME.

April 24th	...	8.37 p.m.
" 26th	...	8.41 "
" 28th	...	8.44 "
" 30th	...	8.48 "

Police Trap.

We understand a police trap is working every Sunday from midday till 7 p.m. between Sunbury Cross and Staines.

The Price of Motor Spirit.

The A.A. has called a meeting of all interested motorists at the Star Hotel, Maidstone, for to-day (Thursday, the 24th) at 3 p.m. to discuss "the price of motor spirit." Mr. P. Frost Smith will be in the chair.

Eastertide Events.

This Eastertide several important events took place in the motor cycling world. In ordinary circumstances, *The Motor Cycle* would have commented upon and illustrated the events in this issue; but in this instance we have refrained, out of consideration for our works staff. Few realise the task of printing a journal with a huge circulation such as *The Motor Cycle* enjoys. Incidentally, it has set up a world's record in automobile journalism. This issue actually borders upon the 100,000 mark. To have included illustrated descriptions of Easter events in this issue would have necessitated the curtailment of a long-anticipated holiday badly needed by all the sections of our works.

1919 Peugeot Motor Cycles.

Despite the fact that we have heard rumours that the 1919 Peugeot range would include a four-cylinder, the Peugeot firm has decided to remain faithful to the twin-cylinder 45° type for the present year. The machines, however, have been improved by the fitting of a countershaft gear box, the changes being effected by a lever placed on the right-hand side of the frame.

The two twin-cylinder types will be the 3½ h.p. and the 6 h.p., the former having cylinders 56 mm. x 70 mm., two-speed gear, and 650 mm. x 50 mm. tyres. The price will be approximately £87. The 6 h.p. pattern will have cylinders 70 mm. x 96 mm., three-speed gear box (which is curious, as the third speed is obviously needed much more on the lower-powered machine); price approximately £96.

The sidecars will be sold made in wicker, sheet metal, and wood, the latter following the general form of the floats of a seaplane.

Motor Cyclists in Airmen's Garb.

The leather Flying Corps coats are very popular with motor cyclists this year.

Turbines.

A Johannesburg man has invented an internal combustion turbine, but then so have men in nearly every town in Great and Greater Britain.

Standardised Chains.

Three of the most important chain manufacturers—i.e., Hans Renold, Ltd., Brampton Bros., and Coventry Chain Co.—have agreed to standardise chain sizes, a policy which tends to increase outputs and facilitate renewals. The sizes of interest to motor cyclists are as follows:

	Pitch.	Inside Widths!
Magneto chain	.375 (1½ in.)	.125 (1 in.)
Motor cycle chain	.5 (1 in.)	.25 (¾ in.)
Ditto	.5 (1 in.)	.19 (¾ in.)
Ditto	.625 (1½ in.)	.25 (1 in.)
Ditto	.625 (1½ in.)	.375 (1½ in.)
Ditto	.75 (1½ in.)	.32 (1¼ in.)
Ditto	.75 (1½ in.)	.44 (1½ in.)
Cycle car chain	1 in.	.67 (1½ in.)

The Cycle and Motor Trades Benevolent Fund.

We are in receipt of the "Handbook of the Cycle and Motor Cycle Trades Benevolent Fund," which contains the annual report of the general hon. secretary, Mr. A. J. Wilson, showing the state of the affairs of the fund to be most excellent. There has been a gain of 1,566 members during the year, and the financial position of the fund has been improved to the extent of £2,715 12s. 6d. In the report, it is pointed out that over 1,000 members and subscribers have been serving in H.M. forces, and their return to civilian life has naturally entailed heavy calls on the fund. Assistance is also required by members who had their own businesses and intend to start again.

Special Features.

ROAD TESTS OF NEW MODELS.

OVERSEAS SECTION.

THE GREAT MARKET OVERSEAS.

On the Road.

Every week-end sees more machines on the road—and many of these new models.

Motor Cycle Police.

A Middlesex reader, who has been trapped by plain-clothes policemen who were using a sidecar outfit, is very sore that "motor cyclists should trap each other," and suggests that they deserve to be given the cold shoulder by other motor cyclists. We scarcely like to give the number of the machine in case it was a borrowed one. This appears to be a new departure on the part of the English police, but we would point out that in America almost every city has its squad of police mounted on motor cycles. Maybe, when the police taste of the joys of motor cycling, they will not be so anti-motorish.

How the French are disposing of their Surplus Motor Vehicles.

In a leader in this week's issue, we suggest that the Government should hold sales of Army motor cycles in the provinces. The French Government has already decided to sell its surplus Army vehicles in twenty-five different centres. We hope a similar decision will be reached in this country. Successful sales of Army horses and mules have already taken place in scattered provincial centres, and it is fairly certain that auction sales of motor cycles would be equally successful if arranged to be held in different parts of the country.



The Leeds N.M.C.F.U. lined up for the start of their run to Boroughbridge and Thirsk.

Which Type?

Specifications from Overseas still continue to arrive, and we hope shortly to summarise them.

The Parisian Taxi Sidecars.

We understand that 200 of the taxi-sidecars to be put on the streets of Paris will be running in June. The drivers will be in uniform, and will, we are informed, be clean, polite, and correct in their behaviour. It is also rumoured that there will be no tips.

**The London-Edinburgh Run.**

We are able to announce still further particulars with regard to the London-Edinburgh run. It has now been decided that competitors who, as we have announced before, will enter for the single journey only, will be allowed to be a quarter of an hour early or half an hour late at all controls, except the final one at Liberton, where they must arrive to schedule. Competitors, however, will have to hand in their number cards at the official hotel in Edinburgh. The run starts at 9 p.m. on June 6th, and it is interesting to note that the moon will be one day older than the first quarter on that night. The awards will be gold, silver, and bronze medals, if possible.

The M.C.C. of South Australia.

On January 27th, at Sellicks Beach, the M.C.C. of South Australia completed its record runs, held over from the December meeting, with the following results, all electrically timed, with flying starts:

MILE PASSENGER, OVER 600 c.c.

- E. Ferguson (8 Indian and sc.) ... 45½s. (79.29 m.p.h.)
E. A. Cutting (Indian and sc.) ... 57½s. (62.5 m.p.h.)

HALF-MILE PASSENGER, OVER 600 c.c.

- E. Ferguson (8 Indian and sc.) ... 22½s. (80.35 m.p.h.)
E. A. Cutting (Indian and sc.) ... 30s. (60 m.p.h.)

HALF-MILE SOLO, 301-350 c.c.

- A. McKee (Kent) ... 35s. (51.42 m.p.h.)
OVER 600 c.c.
E. Ferguson (8 Indian) 20½s. (86.54 m.p.h.)
L. Tapp (Indian) ... 24½s. (74.4 m.p.h.)



(Top) The Public Schools M.C.C. opening run. Members' motor cycles outside the Hut Hotel, Wisley.

(Bottom) Lt. H. B. Browning, R.G.A., hon. sec. of the club, astride his overhead valve Bat-Jap.

Sidecar Manufacturers in South Africa.

A firm in Johannesburg is seriously entering the sidecar industry, producing chassis and bodies; and over 1,000 vehicles already have been turned out of the factory. It is said that over £13 is saved in freightage alone upon each sidecar produced and sold in South Africa.

Motor Cycle Clubs in South Africa.

Motor club life has been very brisk in S. Africa, and many motor cycle clubs in Natal have drawn up fixture lists. The Natal M.C.C. has taken all its old-time trophies out of safe deposit in preparation for new competitions. The Durban and Maritzburg, E. London, Cape Peninsula, and Rand clubs are also busy. This enthusiasm will undoubtedly be reflected in an increasing demand for machines.

Motor Cycles for N.W. Mounted Police.

The Canadian Government recently held a severe trial of American motor cycles eligible for service with the N.W. Mounted Police, which is being reorganised. A considerable number of motor cycles are to be used in future in connection with tourist traffic, border smuggling, the chasing of outlaws, etc.

A New Motor Cycling Review in France.

We learn that a new sporting paper is to appear under the title of *Motorcyclisme*. The paper will deal solely with motor cycling in France, and will be managed by Mr. Sweetts, who is well known in the motor cycling world. The paper will appear regularly every fortnight, starting at the end of the month. The offices are 1, Cité Paradis, Paris.

Home-produced Fuel.

The Liverpool M.C.C. Whit-Monday Trial will be run entirely on benzole—a good example for other clubs to follow.

Magnetised Sprockets.

The leakage of magnetism into the steel sprocket of a certain American magneto is not confined to machines in this country. A reader of *The Motor Cycle* has had the same trouble in America.

The Scooter.

In August of last year we asked in these columns what had become of the motor scooter. In a period of less than twelve months half England is talking about it.

Safety First.

In America the road associations make great use of the phrase "safety first," and at one corner, we are informed, there is a notice "Safety First—Dangerous Corner—Slow Down to Fifty."

Benzole in the Transvaal.

It is said that nearly 5,000 square miles of coal deposits are in the Transvaal. The extractable tonnage is conservatively estimated at about 56,000 millions. Converted into benzole, with existing means of distillation, this would produce approximately 140,000 million gallons of motor fuel.

A Suggestion.

Why is it that when very unusual fittings are adopted on motor cycles, the makers fail to place adjacent to the article a word or letters indicating that it operates the reverse way to the usual method? For instance, suppose an oil tap is closed by turning it anti-clockwise, and opened by turning it clockwise, which is contrary to the usual method, would it not be an easy matter to indicate the direction of movement by an arrow and the word "Open"? It is done in a few isolated cases, but is more generally omitted.

THE BUYERS' GUIDE.

Current Prices and Delivery Dates for 1919 Motor Cycles.

Make.	H.P.	Particulars in Brief.	Price.	Delivery.	Make.	H.P.	Particulars in Brief.	Price.	Delivery.
A.B.C.	3	Spring frame	£ 85 0 0	May.	JAMES	4 1/2	No. 6, single, 3-speed	£ 89 5 0	
ABINGDON	3 1/2	3-speed	85 0 0	Delivery six to	JAMES	3 1/2	No. 7, V twin, 3-speed	89 5 0	
ABINGDON	6-7	3-speed	100 0 0	eight weeks.	JAMES	2 1/2	No. 8, 2-stroke, 2-speed	51 12 0	
A.I.S.	6	Twin, 3-speed	106 1 0	Delivery com-	JAMES	5-6	No. 9, twin, 3-speed	99 16 0	
A.J.S.	6	Sidcar combination	142 16 0	menced.	JAMES	—	Sidcar Canoelet	22 10 0	
ALLEN	2 1/2	2-stroke, 2-speed, clutch,		Delivery six to	JAMES	—	Sidcar de luxe	26 5 0	
		and kick-starter	65 0 0	eight weeks.					
ARIEL	3 1/2	3-speed	85 0 0		LEVIS	2 1/2	2-stroke, single-gear	43 13 0	Entire output
ARIEL	5-6	Twin, 3-speed	100 0 0	Delivery com-					booked.
ARIEL	6-7	Twin, 3-speed	100 0 0	menced.	L.M.C.	4 1/2	ditto	85 0 0	Delivery com-
ARIEL	—	Sidcar	30 0 0		L.M.C.	6	Twin ditto	95 0 0	menced.
BLACKBURN	2 1/2	4-stroke, 2-speed, clutch	60 0 0	—	MATCHLESS	8	Combination	140 0 0	—
BLACKBURN	4	3-speed	82 0 0	—	METRO-TYLER	2 1/2	2-stroke, single-speed	49 9 0	Delivery
BLACKBURN	8	Combination	125 0 0	—	METRO-TYLER	2 1/2	2-stroke, 2-speed	57 1 0	commenced.
BRADBURY	2 1/2	4-stroke, 350 c.c., 2-sp.	68 0 0	—	MORGAN	8	Sporting model	145 0 0	Delivery
BRADBURY	4	Single gear	70 0 0	Delivery com-	MORGAN	8	G.P., J.A.P. engine	155 0 0	commenced.
BRADBURY	4	Single, 3-speed, chain	87 0 0	menced.	MORGAN	8	De luxe, M.A.G. (w.c.		Entire out-
BRADBURY	6	Twin, 3-speed, chain	195 0 0				J.A.P. (10 extra)	150 0 0	put for 1919
BRITISH EXCELSIOR	2 1/2	2-stroke, 2-sp. counter-		Delivery com-					booked by
		shaft, kick-starter	62 0 0	menced.					various
BRITISH EXCELSIOR	2 1/2	2-stroke, 2-speed	56 0 0						agents
BRITISH EXCELSIOR	2 1/2	2-stroke, single gear	50 0 0		NEW IMPERIAL	2 1/2	J.A.P. engine, 2-speed	50 8 0	
BRITISH EXCELSIOR	6 or 8	3-speed, combination	150 0 0		NEW IMPERIAL	2 1/2	J.A.P. engine, 2-speed,		Delivery com-
B.S.A.	4 1/2	All-chain drive	81 18 0	—			clutch	54 16 0	menced.
B.S.A.	4 1/2	Chain-cum-belt	79 16 0	—	NEW IMPERIAL	8	Combination	132 6 0	
B.S.A.	4 1/2	Single gear	66 3 0	—	NEW RIDER	2 1/2	2-stroke, single speed	48 0 0	
B.S.A.	3 1/2	Sidcar	29 8 0	—	NORTON	2 1/2	2-stroke, 2-speed	55 10 0	
					NORTON	3 1/2	All-chain drive	87 0 0	
CALTHORPE	2 1/2	J.A.P. engine, 2-speed	52 0 0	Delivery com-	NORTON	3 1/2	T.T. c/shaft, all-chain	73 0 0	
CALTHORPE	2 1/2	2-stroke, 3-speed	50 0 0	menced.	NORTON	3 1/2	Single-gear, B.R.S. eng.	80 0 0	
CARFIELD	2 1/2	2-stroke, 2-speed	51 0 0	Delivery com-	NORTON	3 1/2	ditto, with B.S. engine	80 0 0	
				menced.	NORTON	3 1/2	Standard T.T. all-belt	63 0 0	
CONNAUGHT M'ture	2 1/2	2-stroke, single-speed	38 0 0		OMEGA	2 1/2	4-stroke, 2-speed	53 11 0	Delivery com-
CONNAUGHT M'ture	2 1/2	2-stroke, 2-speed	46 0 0	Delivery	OVERSEAS	3 1/2	3-speed	80 0 0	menced.
CONNAUGHT Stand'd	2 1/2	2-stroke, single-speed	42 0 0	commenced.	OVERSEAS	6	Twin, 3-speed	92 0 0	Delivery com-
CONNAUGHT Stand'd	2 1/2	2-stroke, 2-speed	49 15 0						menced.
CONNAUGHT Stand'd	2 1/2	2-stroke, 2-speed, clutch	53 0 0		P. and M.	3 1/2	R.A.F. model	78 0 0	Delivery com-
COVENTRY EAGLE	2 1/2	2-stroke	47 5 0	Delivery com-	P. and M.	3 1/2	Combination	102 0 0	menced.
COVENTRY EAGLE	2 1/2	ditto, 2-speed	51 12 0	menced.	RADCO	2 1/2	2-stroke, single-gear	39 13 0	Delivery
COVENTRY EAGLE	2 1/2	J.A.P.	47 5 0		RADCO	2 1/2	2-stroke, 2-speed	48 7 0	commenced.
COVENTRY EAGLE	2 1/2	ditto, 2-speed	51 12 0		REX	4	3-speed	82 10 0	June.
COVENTRY EAGLE	3 1/2	S.A. countershaft 3-sp.	82 19 0		ROVER	3 1/2	3-speed	67 0 0	
					ROVER	3 1/2	Phillips pulley	72 0 0	
DIAMOND	2 1/2	J.A.P. Enfield 2-speed	60 18 0	Delivery com-	ROVER	3 1/2	3-speed	85 0 0	Delivery com-
DIAMOND	2 1/2	2-stroke	47 5 0	menced.	ROVER	3 1/2	Combination	117 10 0	menced.
DIAMOND	2 1/2	2-stroke, 2-speed	56 14 0		ROVER	5-6	3-speed	100 0 0	
DOT	8	Combination	140 0 0	—	ROVER	5-6	Combination	132 10 0	
DOT	3	Twin, 2-speed	70 0 0	—	ROYAL RUBY	6 or 8	Twin, 3-speed	105 0 0	Twelve weeks.
DOT	2 1/2	Twin, 2-speed	65 0 0	—	ROYAL RUBY	2 1/2	2-stroke single-gear	40 0 0	Output booked
DOUGLAS	2 1/2	W.D. model	60 0 0	Delivery com-	SPARKBROOK	2 1/2	2-stroke, single-speed	46 4 0	
DOUGLAS	4	W.D. model	75 0 0	menced.	SPARKBROOK	2 1/2	2-stroke, 2-speed	52 10 0	Eight weeks.
DOUGLAS	4	Combination	95 0 0		SUNBEAM	—	Sidcar for 8 h.p.	36 15 0	
ENFIELD	2 1/2	2-str., 2-sp., ch.in-drive	52 10 0		SUNBEAM	—	Sidcar for 3 1/2 h.p.	28 7 0	Delivery com-
ENFIELD	3	4-stroke, twin, 2-speed	69 6 0	Shortly	SUNBEAM	3 1/2	3-speed, all-chain	96 12 0	menced.
ENFIELD	6	Combination, model 180	126 0 0		SUNBEAM	8	3-speed, all-chain	120 15 0	
ENFIELD	8	Combination, model 190	147 0 0		SUN-VITESSE	2 1/2	2-stroke, single-speed	43 10 0	Shortly.
G.N. CYCLE CAR	10	2-cyl., Standard model	140 0 0	—	SUN-VITESSE	2 1/2	2-stroke 2-speed	55 0 0	
G.N. CYCLE CAR	10	2-cyl., Vitesse model	170 0 0	—	TRIUMPH	4	W.D. model	87 0 0	Delivery com-
HUMBER	3 1/2	Flat twin, 3-speed	85 0 0	Three months.	TRIUMPH	2 1/2	2-stroke, 2-speed	54 0 0	menced.
Ivy de Luxe	2 1/2	2-stroke, single-speed	42 0 0	—	VELOCETTE	2 1/2	2-stroke, 2-speed	48 0 0	Delivery
Ivy de Luxe	2 1/2	ditto, 2-speed	50 0 0	—	VELOCETTE	2	2-str., 2-sp., lady's mod.	50 0 0	shortly
Ivy de Luxe	2 1/2	I.O.M. model, single-sp.	45 0 0	—	WOOLER	2 1/2	2-stroke, variable gear	61 19 0	—
Ivy de Luxe	2 1/2	ditto, 2-speed	53 0 0	—	WOOLER	2 1/2	Flat twin, 4-stroke	61 19 0	—
IXION	2 1/2	2-stroke, single-speed	42 0 0	Delivery com-					
IXION	2 1/2	2-stroke, 2-speed	50 0 0	menced.					
IXION	2 1/2	2-stroke, 2-speed, lady's	56 0 0						
IXION	2 1/2	2-stroke, sidcar	68 10 0						

AUTO CYCLE UNION NOTES.

(Officially communicated.)

THE ARBUTHNOT TROPHY.—The Auto Cycle Union is pleased to report that considerable interest in the Arbuthnot trophy competition is being shown by naval motor cyclists, and there is every promise of the event proving a well contested one. It will probably be held during the early part of July. The late Rear-Admiral Sir R. K. Arbuthnot was a prominent motor cycle competition rider, and sacrificed his life in the Battle of Jutland, the last venture of the German fleet.

A WAR MEMORIAL.—At the suggestion of Col. F. Lindsay Lloyd, the General Committee of the Auto Cycle Union will consider the advisability of suitably commemorating the great war services rendered to the country by motor cyclists, both Overseas and at home.

A.C.U. TRAVELLING EXPENSES.—It is proposed that the third-class fares of members of the General Committee of the Auto Cycle Union resident more than seventy-five miles from the place of meet-

ing of the General Committee shall, on demand, be repaid to them out of the funds of the Union.

BADGES FOR MOTOR CYCLISTS.—As fast as supplies are forthcoming from the manufacturers, the Auto Cycle Union is issuing badges to members applying for them for attachment to their machines. Those desirous of receiving the A.C.U. badge may rest assured that any delay is occasioned only by the difficulty of obtaining deliveries from the makers.



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address

WHAT SHALL WE WEAR?

Sir,—The fact that "K.S." is unable to keep rain from running down her neck is no evidence that all others are similarly incapable. One does not hear men complaining about water running down their necks, and I see no reason why women should not be as sensible as men about their neckwear.

When I wrote my last letter I left details to the intelligence of your readers. I thought it unnecessary to say clothes with V necks were unsuitable in the rain.

PHYLLIS VERNON.

TANDEM MOTOR CYCLES.

Sir,—May I be permitted through your paper to make a plea for the tandem motor cycle. I have for the past ten years been trying to secure a motor cycle with seat front and rear, the rear seat to be suitable for a lady. I need hardly enumerate the advantages of this machine, as those who use the motor cycle other than solo will readily realise the benefits of a cycle built on these lines for touring purposes. Is there no maker who is willing to turn out a tandem motor cycle? If there should be a firm willing to place on the market a machine with a future, namely, a tandem motor cycle, I trust to hear from such, either direct or through your pages.

NORMAN GREEN.

[There were several tandem motor cycles on the road fifteen years ago, and they died a natural death.—Ed.]

ANOTHER NEW MODEL.

Sir,—Having been a reader of your most valuable journal for many years, I trust you will pardon me by giving you a rough idea of the motor cycle (combination) which I intend to manufacture on my release from the army, with which I hope to open the eyes of the motor world. It is my own invention and works most satisfactorily. The engine is a flat twin of 6 h.p., of the two-stroke principle, but I shall term it a one-stroke. The cylinders are of aluminium, fitted with steel liners and detachable heads, air-cooled. My intention is to use only one piston, no crankshaft, and no connecting rods. There is only one short shaft in the complete unit, mounted on two large ball bearings which carry the flywheel; and my patent gear, which gives four speeds and contains clutch and engine starter, the magneto being coupled direct to this shaft. From this shaft the power is transmitted to the back wheel by an enclosed silent chain. The unit is perfectly silent and vibrationless, as there are no gear cut wheels in the unit whatever. The machine will have a very smart and pleasing appearance, and complete with C.B. sidecar it is to sell at the very low figure of £45.

B.E.F.

A SUGGESTED CYCLE CAR.

Sir,—I was pleased to read that someone has taken sufficient interest in my suggestion for a cycle car to be built on the lines of the Fordson tractor to write to you on the subject. By the way, my idea is more on the lines of the old 8 h.p. Rover single-cylinder car, designed, I believe, by Mr. Lewis. I mentioned his name in my article, but the omnipotent blue pencil has been at work, with the result that the name does not appear. I should also like to disclaim any liability for the wording of the heading, although the idea is, of course, "borrowed." It is unfortunate we cannot all be original, but as originality appears to suffer when brought in contact with commercialism it does not always pay to be too original.

I know the suggestion is opposed to what is considered ideal car practice. It is obvious that the unsprung weight would be subjected to excessive vibration, and this I knew at the time the suggestion was made.

The front springing would partially insulate the engine and gear box from vibration, and, after all, I think most rear axles are unsprung weight. The front springing is borrowed from the Ader—a French car—not from the Ford or the Fordson. The Ader car was produced first about 1888.

I am obliged to Wm. A. Davis, A.M.I.M.E., for his kind advice, but I cannot understand his remark that "one might just as well start designing a traction engine on the lines of the Levis." What has that to do with the suggestion? If every traction engine was as simple as the Levis engine and balanced on a single pair of wheels I could understand him better. Was not the *Mauretania* designed on the lines of smaller vessels that preceded it? If not, what lines did the designer follow?

Will Mr. Davis let us see his idea of a totally enclosed transmission from front to rear by "putting a case round it" (not an enclosed propeller-shaft only) without increasing unsprung weight. The suggestion was not merely to close in the shaft, but to provide for lubrication of all the transmission from one point, viz., the crank case sump of the engine.

MECHANICUS.

AN OLD CHALLENGE.

Sir,—One remembers that some time ago a controversy between Messrs. De Lissa and Bradshaw took place, in which the latter challenged any maker of motor cycle engines to put up one for a bench test. I think Mr. De Lissa agreed to do so when he was able to import a suitable engine. Could this now be done? It would be interesting, as Mr. Bradshaw has apparently revised his opinion of overhead valves.

Re agent's methods: I wrote a firm for a 4 h.p. Douglas tappet complete, asked them to post it to an address as soon as possible after receiving the cost from me. No reply. After several days I proceeded on leave and called on this firm, and learnt that "they did not have one, or they would have replied to my letter," and "if we have not the article we do not reply—unless you enclose a stamp."

HURDCOTT.

IN DEFENCE OF THE HUB GEAR AND BELT DRIVE.

Sir,—Your correspondent "M.R.C." has much interested me in his remarks on hub gears. I have at present a big $4\frac{1}{2}$ h.p. Quadrant with a large and heavy sidecar fitted with a hub gear, and also at various times have had other machines so fitted, and have never had any trouble with them.

The thing overlooked by the average rider is the necessary and simple adjustment of the gears at frequent intervals and the daily oiling with thin cycle oil. This last is most important. For comfortable sidecar work hub gears are unrivalled, as with a small engine pulley one can get quite a comfortable speed on top gear, and the average $3\frac{1}{2}$ h.p. machine will then carry three, if necessary, anywhere on main roads. The reason for the decline in popularity of hub gears with their sweet drive, in my opinion, is the difficulty of repairs or adjustments of any kind. I quite agree with "M.R.C." that if made larger and more substantial, and also more easily repairable should occasion arise, hub gears would again regain much of their lost popularity.

E. KIMBER.

A TABLOID HISTORY OF AIR-COOLING.

Sir,—I must apologise for the slip in my letter of April 3rd. The Salmson (Canton-Unné) engine was wrongly included in the examples of rotaries. Of course, as "Road Rider" points out, it is a radial, the M7 model (90 h.p.) having, I think, seven water-cooled cylinders, and the 190 h.p. "horizontal" model fourteen.

"Road Rider's" figure of 10% as the loss of b.h.p. due to circumferential wind resistance is probably correct, but, as I said in the letter referred to, the "flywheel effect" of the rotating cylinders, which is augmented by the low compression, does help things considerably.

All the same, as "Road Rider" and I agree, the rotary is more than supplanted by the radial, which has so many of its advantages with so few of its defects. REVS.

THE BEST IN THE WORLD.

Sir,—With reference to the article "Evolving a Motor Cycle from First Principles," by Major Waterlow in *The Motor Cycle* for the 10th inst., I must correct him on one point. He says in his article: "I should . . . by reminding my readers that motor cycle manufacture is the only branch of the motor industry in which we British really lead the world." I must ask Major Waterlow if he can name any aero engines of any country, enemy included, that can hold a candle to the following: Rotary—B.R.2; Stationary air-cooled—A.B.C., Wasp, and Dragonfly; Water-cooled—Rolls-Royce, Falcon, and Eagle?

Major Waterlow may have been in "Mesopotamia" for some time and is now out of touch with aerial motor developments, but I cannot allow such a sweeping statement to go unchallenged, as it is admitted our aero engines are "the best in the world." SPARKPLUG.

Burton-on-Trent.

AVERAGE SPEEDS.

Sir,—Regarding the letter on average speed in *The Motor Cycle* for April 10th, your correspondent "R.N." evidently believes with the cynic that "all men are liars." That being so, I feel that I may venture to make a few remarks about average speeds without danger of incurring any more blasting reproof than being dubbed by your correspondent as one of the common herd, which worries me not at all. As "R.N." lives at Slough it is probable that he knows the road from London to Bournemouth. About a

year ago I rode from Bournemouth to Egham, *via* Christchurch, Lyndhurst, Redbridge, Totton, Winchester, Itchen Abbas, Alton, Alresford, Farnborough, Bagshot, and Sunningdale. The distance is about ninety-eight miles, and my running time was 2h. 50m. exactly. This works out at 34 m.p.h. and a bit over.

I stopped for lunch at Winchester, and a short stop at Farnham for some light refreshments. On both these occasions I was careful to note the exact time and duration of each stop on paper.

The run was made on a 1916 3½ h.p. Rover, the Tourist Trophy model, with a Philipson pulley. The engine ran perfectly throughout, kept perfectly cool, and there was an entire absence of any signs of "racing" at speed.

I am unaware what make of machine "R.N." rides, but I feel quite sure that, given a machine such as my Rover or a Norton B.R.S. model, he would soon modify his opinion as to the impossibility of averages of above 30 m.p.h. for long distances. Usual disclaimer.

R.D.B.

Egham.

HOW TO SELL A MOTOR CYCLE.

Sir,—I am writing to congratulate you on the excellence, as an advertising medium, of your paper *The Motor Cycle*.

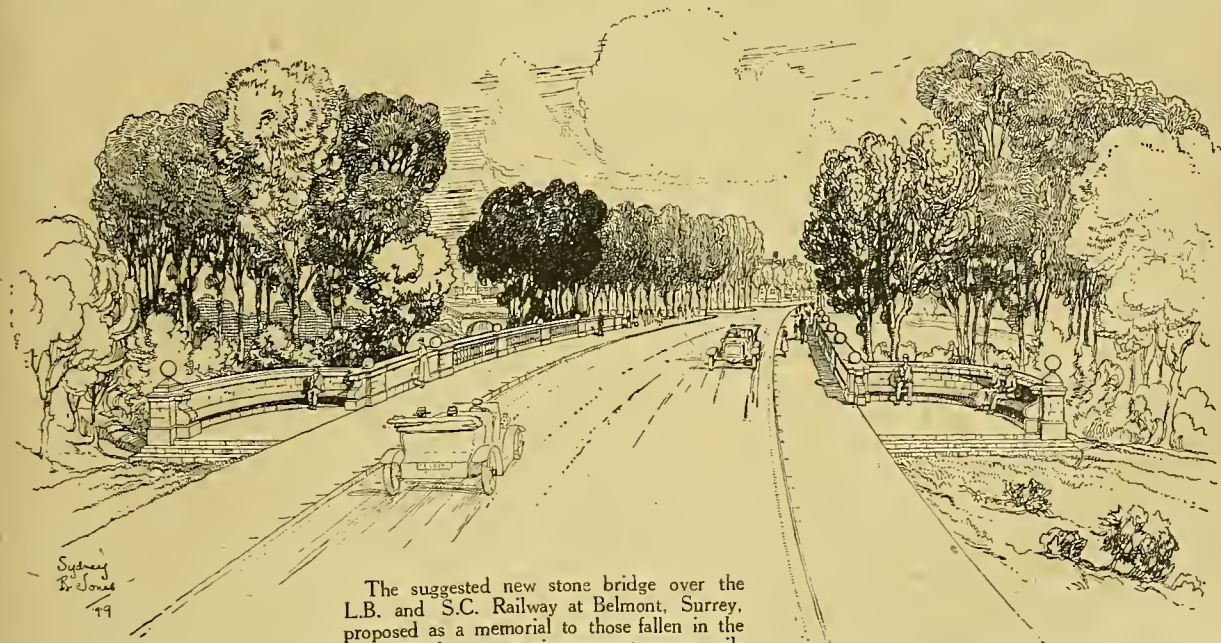
Last week I sent you a notice to the effect that I was selling a 6 h.p. A.J.S. combination (1915). It was a bare, unpretentious notice, but by 11 a.m. on the day of issue I had disposed of the machine. The purchaser had made a journey of fifty miles and brought the money with him. He had to repair a tube and interchange a pair of wheels preparatory to riding off, and before he was clear away three other applicants put in an appearance and were disappointed.

In the course of the day a dozen telegraphic offers arrived, most of the senders having prepaid a reply.

Next morning a dozen letters arrived from the "canny" Scot, and in the course of the day the wires were again heated by urgent but belated messages. One of the senders forwarded a considerable deposit, but stated neither name nor address. If I do not discover him soon I shall have to ask for your assistance in order that I may preserve my reputation for honesty.

May I add, sir, that I am amazed at the credulity of the public. My machine might have been a "dud," yet I could have sold it twenty times over. I had no time to do any cleaning, and the "bus" was looking its very worst.

D. H. M. CURTAIN.



The suggested new stone bridge over the L.B. and S.C. Railway at Belmont, Surrey, proposed as a memorial to those fallen in the war. At the present time many town councils are undecided as to the manner in which the

great sacrifices made during the war shall be commemorated, and such schemes which beautify the highways and serve so many people are truly better than ordinary monuments. It is proposed that the bridge depicted above shall bear the names of the glorious dead.

IMPROVING THE SIDECAR OUTFIT.

Sir,—We notice in your issue of March 27th, page 304, an article by Maj. P. H. Lewis, R.E., in which the saddle type tank is recommended. We would like to point out that this type of tank is our registered design, No. 666269, and is now fitted in all cases to our Allon motor cycles.

We also observe, on page 296, particulars of a patent specification by E. A. Radnall for a cradle method of mounting the engine, etc., of a motor cycle. We would point out that we have used the cradle method of assembling on the Allon motor cycle for more than five years, and we cannot, therefore, see that Mr. Radnall can claim any novelty.

ALLDAYS AND O'NEILS PNEUMATIC
ENGINEERING CO., LTD.

ADVANTAGES OF A TWO-STROKE.

Sir,—I am afraid Mr. Varney is talking a little "tall" when he says his 2½ h.p. Levis will average 35 m.p.h. with a sidecar and 45 m.p.h. solo. To average these speeds the machine would have to travel considerably faster, and nothing will convince me, except an actual test, that the 2½ h.p. standard Levis is capable of the above. I am pleased to say I am the owner of a 1916 standard 2½ h.p. long-stroke T.T. three-speed A.J.S., fitted with a Binks three-jet carburettor (with no dead spot), and if Mr. Varney lived nearer here I would be very pleased to give him a run out to see him average his 45 m.p.h. solo on the Levis. My A.J.S. has covered half a mile on the main road at 53 m.p.h. (not per speedometer reading), geared 5½ to 1, and to average 45 m.p.h. I would have to drive practically "all out" the whole time, which is impossible on the open road. My best average was from Birkenhead to Oswestry in the summer of 1917, and worked out at 29½ m.p.h. over a distance of about forty-six miles, and to do this I had to "go some." I have had sprints with all kinds of two-strokes, and the most that could be got out of the best of them was very little over 40 m.p.h. (excepting, of course, the Scott). If Mr. Varney's Levis will beat the 2½ h.p. Douglas (top speed between 40-45 m.p.h.), then he has got "some bus." My A.J.S. can do anything from 2 m.p.h. up to nearly 60, and on one trip from Birkenhead to Oswestry and back my petrol consumption worked out at exactly 184 m.p.g. at an average speed of 22½ m.p.h. I think I am perfectly safe in saying that there is no two-stroke at the present time running to equal this. Usual disclaimer, please. L. STUART.

THE NEW A.B.C.

Sir,—I was very much interested with the new A.B.C. motor cycle illustrated in *The Motor Cycle* for March 13th. One thing in particular the inventor has solved is the rear springing, which, to my way of thinking, is ideal. I should

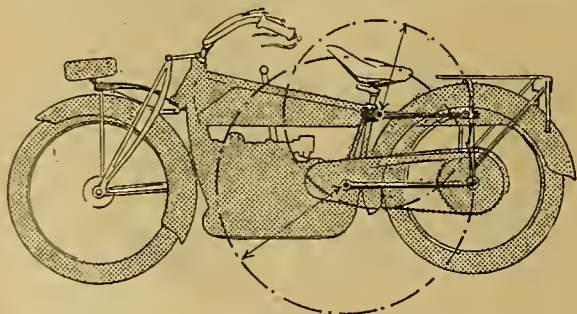


Diagram illustrating the letter from "AD 3744."

like to know though what will happen after a thousand miles or so to the springs, bolts, or carrier stays owing to the chain stays being much longer than the springs. If a circle is drawn, using the bolt of the stays for a centre, and another circle using the point of the springs where the "give" takes place (my enclosed sketch is self-explanatory) as a centre, it will be noticed the paths of the two circles are not parallel to each other, so, as something has to go, I am keen to know what. The spring would have to bend like a bow, or the joint give where the carrier is bolted to the chain stays.

This is curiosity, not criticism, because I can appreciate a good thing when I see it. AD 3744.

Carliff.

LOSING ONE'S PROP.

Sir,—Having read with interest the correspondence on this subject, I must reply to "Torque's" letter in *The Motor Cycle* of April 3rd.

He says that the 345 h.p. Eagle engine is fitted to heavy machines which are unsafe to dive. Quite so, but I would point out that a number of D.H.4 machines were fitted with these engines, and their speed on the level is over 115 m.p.h., so I cannot see what "Torque" means by diving at 100 m.p.h. One of these machines has been dived "off the map" (over 160 m.p.h.), the map being the pitot reading, but this failed to start the prop., although the engine was O.K. Can "Torque" start a Siddeley Puma engine by diving? I think not. SPARKPLUG.

Barton-on-Trent.

Sir,—In *The Motor Cycle* of March 20th, I notice that one of your readers, who signs himself as "Revs.," states that he cannot see how the "friction of the air on the propeller" could restart a stationary engine. May I point out to "Revs." that I know at least one type of stationary engine that can be restarted by this method.

The engine in question is the D.H.9, which, as you know, has a rather high compression, but, nevertheless, it can always be started by getting "the nose well down," provided that it is in a condition to be started. It is owing to the fact that a D.H.9 could be started in this way that I am where I am now: it meant all the difference to my becoming at least a prisoner of war.

B.E.F.

S.G.W.

OBTURATOR RINGS.

Sir,—In your issue of March 27th we notice a review of a patent for an obturator type piston ring; and, while it is true that the designers of air-cooled aero engines have succeeded in preventing some of the distortion, even so the problem does not appear to be satisfactorily solved.

The considerable development of obturators made during the war has not been published, but it might interest your readers to know that, far from an obturator giving trouble on aero engines during the past few years, there has been absolutely no trouble whatever with such as are manufactured by this company—in fact, it is recognised that no additional overhauling of the Gnome engine is due to their use.

As a proof of this, we might cite the fact that an actual flying life of 250 hours has been recorded, when they were by no means worn out, and that the same obturators can be used again and again in different engines.

The trouble referred to dates back to the beginning of the war, and has long since been overcome. Astonishing as it may seem, the great advantage of obturators lies in the reduction of friction, so that there appears every prospect that they will have a great future.

To any engineer it is evident that a piston ring is a very inefficient packing device, and gases actually get behind it, and, becoming imprisoned, cause additional friction.

We would also refer to the statement that the left-hand drawing shows the conventional Gnome type of obturators, whereas these are applied at the top of the piston, and are thus exposed to the full force of the explosion. In the sketch this is obviously not the case; and, not merely can the pressure on the obturator be reduced, but it is evident that it exists during a portion of the cycle only, and is not imprisoned as with piston rings.

It may interest your readers to know that most promising experiments have also been made with obturators in high-compression engines.

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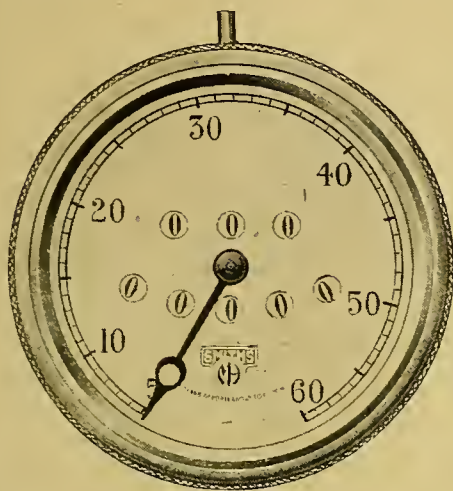
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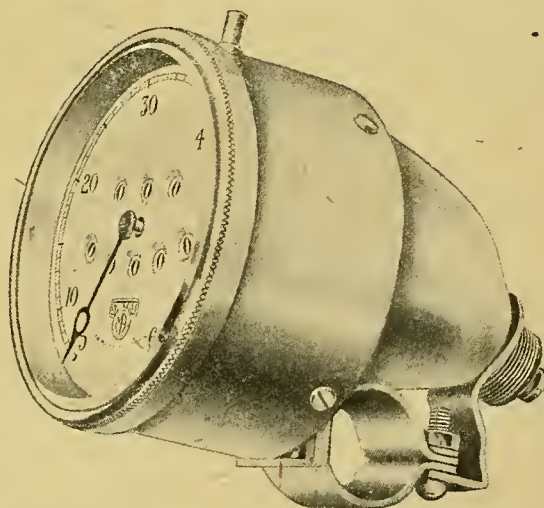
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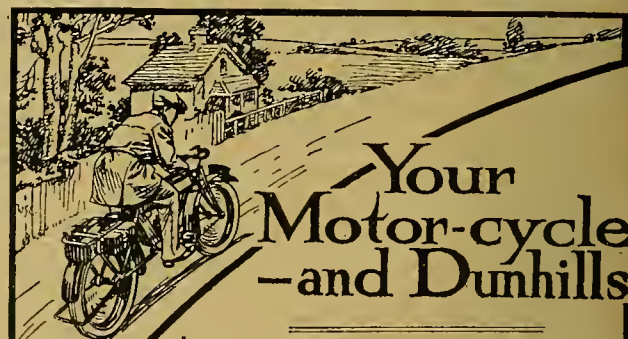
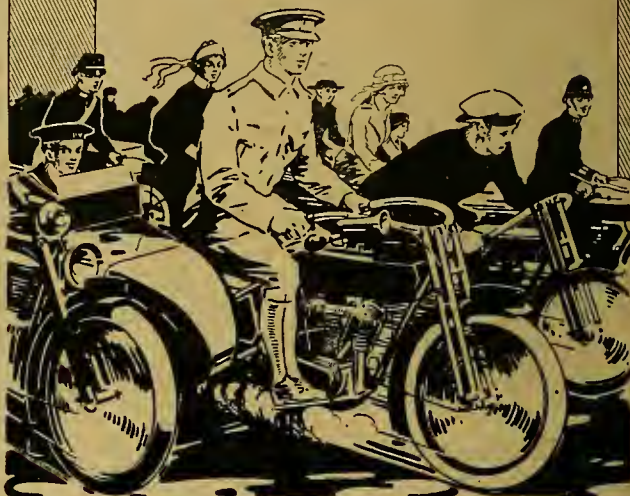
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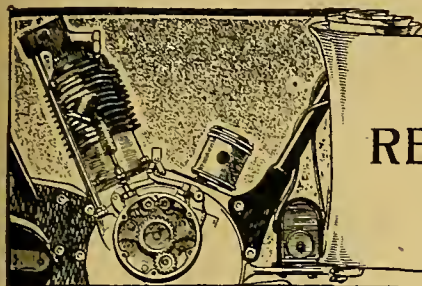
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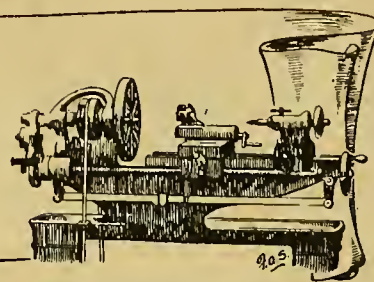
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RECENT PATENTS.

REVIEWED BY B. H. DAVIES.



THE last few years have converted motor cycle engineers to the use of roller bearings for the big ends of the connecting rods. These bearings were the point at which seizure usually commenced if an engine was either over-

missed by a wide margin. The difficulty tends to become acute when a designer wants to fit roller bearings on a one-piece crankshaft with two or more throws; but is tolerably simple where a built-up crankshaft is concerned, as the parts are then easily threaded into place before the crankshaft is completely assembled.

Triumph Roller Bearing.

The Triumph Co. and G. E. Stanley have patented the highly modern arrangement shown in fig. 1, which is, of course, easily applicable to the gudgeon pin if desired. I call it modern for three main reasons. First, the rollers run directly on the hardened crank pin and inside the hardened big end, no separate races being employed. This method saves weight, reduces the dimensions, and facilitates balance. Secondly, a double row of rollers is adopted, which distributes the pressures, and gives a better line of contact with the races. Thirdly, the rollers are "caged." The perspective sketch of the cylindrical housing is self-explanatory. The annular groove at the centre lightens the housing and distributes the oil; and washers may be used if desired.

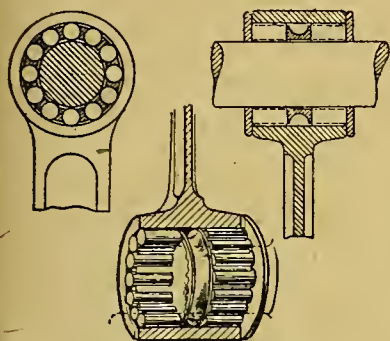


Fig. 1.—Triumph Co.'s connecting rod bearing. Pat. No. 122,559. 10/4/18.

loaded or under-lubricated. In nearly twenty years of road experience I cannot recall seizing up a main bearing, a timing gear bearing, or a gudgeon pin bearing, and the seizures which have befallen me occurred in the big end bearing or to the piston, and the former outnumber the latter very considerably. A roller bearing cannot seize, and there is ample space to equip the big end with a race well able to support the maximum load. Given pistons of proper fit and design, engine seizures should henceforth be unknown, even amongst those expert riders who "scrap," and those beginners who sometimes forget to lubricate. Incidentally, since a roller bearing only requires sufficient oil to protect it from rust, and since the oil ration for the bronze bushes formerly used in the big ends determined the oil ration for the entire engine, we shall use less oil, and carbon crusts will accumulate much less rapidly. With bronze big end bushes a $3\frac{1}{2}$ h.p. engine needs a charge of oil every five miles. With roller big end bearings I have repeatedly ridden forty miles on a charge. In other words, the oil ration is now chiefly determined by the needs of the piston and the gudgeon pin, and they normally require far less oil than the old type of big end bush.

There has been a most amusing scurry for patents with regard to the mounting of roller bearing big ends, and a vast amount of ingenuity has been exhibited. I fancy a few of the pioneer inventors are feeling rather sore, and must have had high words with their patent agents, for valid master patents in this sphere might have proved valuable, and were not

explosive mixture. Under Mr. Law's patent a bypass is taken from a suitable point in the transfer pipe, and the delivery port of this bypass is made to surround the petrol nozzle. So, instead of a low air pressure approximately adjacent to the petrol nozzle, Mr. Law provides a high air pressure absolutely concentric with the petrol jet. His bypass stream of air and petrol impinges on to the hot deflector ledge on the piston crown, and the stream, so to speak, bounces back into the stream of pure air emerging from the transfer port.

Forced Lubrication.

Mr. C. G. Pullin (the T.T. winner) has a patent interesting to motor cyclists, though it is chiefly propounded for aero work. If an aluminium piston is used in an aluminium cylinder, splash lubrication is inadequate, and any

Jet in Transfer Passage.

Mr. L. W. Law has patented the special method of vaporising petrol on two-stroke engines illustrated diagrammatically in fig. 2. Pure air is drawn through the inlet port into the crank case as the piston rises. When the piston descends this air is compressed, and when the descending piston uncovers the transfer port the compressed air is squeezed up the transfer pipe and through the transfer port into the combustion chamber. Existing patents cover such an arrangement in conjunction with a petrol nozzle mounted in the head of the transfer pipe, so that the rush of the compressed air past the nozzle draws petrol into the combustion chamber, and so furnishes an

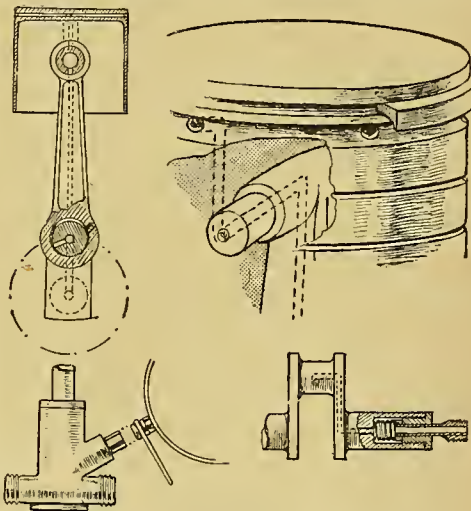


Fig. 3.—Pullin's lubricating device. Pat. No. 109,113

failure of the oil supply results in very rapid seizure and the speedy wrecking of the engine. Mr. Pullin employs pressure-fed lubrication through a hollow crankshaft, connecting rod, and gudgeon pin, to oilways machined in the thick skirt of the aluminium piston, the oil passage being finally formed into a circumferential in the piston crown just below the head. Radial holes allow the oil to escape into an empty groove cut round the outside of the piston.

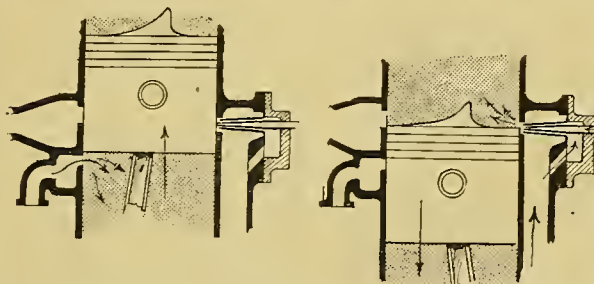


Fig. 2.—Law's fuel injection. Pat. No. 122,564. 23/4/18.

Recent Patents.—

The grooves and holes by which oil passes up the connecting rod are so shaped and positioned that the oil is supplied to the piston on the up-stroke only. Above the oil delivery groove on the piston is an obturator ring, fitted upside down as an inverted L (i.e., 7). On the down-stroke, this obturator wipes the oil off the cylinder walls, and forces it back through the ducts in the piston, from which it drains back to the crank case through an escape hole, which is open on the down-stroke only. Should the oil pump cease working, the engine is immediately switched off, as a plunger switch in the magneto wiring circuit is opened when the plunger is relieved from the oil pressure. A neat union for connecting a (stationary) oil pipe to a (revolving) crankshaft is included in the design.

A "Changed Over" Contact Breaker.

The James Co. have patented a neat method of transferring the magneto contact breaker to the accessible or off side of sidecar machines. A small spur wheel, fitted outside the crankshaft transmission sprocket, drives a second and larger spur wheel mounted on a stub axle projecting from the crank case; and the magneto is driven by chain off a sprocket secured to the larger spur wheel. The contact breaker will thus come on the off-side of the machine.

A Square Four-cylinder Engine.

I doubt whether M. Poisson-Quinton's engine will ever figure on a motor cycle. It is the first "square" engine I have

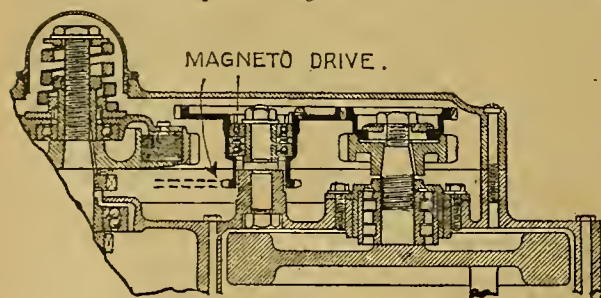


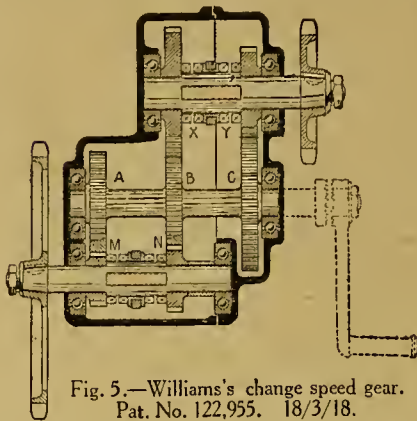
Fig. 4.—The James magneto drive. Pat. No. 123,183. 25/2/18.

ever seen. To form an idea of it, place four 2 lb. jam jars upside down on a table, arranging them so that their plan view resembles a four-leaved clover. Put a 1 lb. jam jar centrally on top of each 2 lb. jar. Imagine that each pair of jam jars is a two-stroke cylinder with a lower unit of greater bore than the upper unit, and imagine that a "tandem" piston of two corresponding diameters works in each cylinder. In each case the lower and bigger cylinder is a charging pump supplying mixture to the upper and smaller cylinders of its neighbour. Thus you get a remarkably compact four-cylinder two-stroke engine. The action of the connecting rods on the crankshaft is too complex for description here.

Four-speed 'Gear Box.

Mr. T. L. Williams protects a four-speed gear box with three shafts. The diagram is self-explanatory. The layshaft carries three gears, A, B, and C, of

which A and B are constantly in mesh with two gears M and N on the driving-shaft, and B and C are constantly in mesh with two gears X and Y on the driven-shaft. Dog clutches are used to lock M and N to the driving-shaft, and X and Y to the driven-shaft. The four drives are obtained through M, A, B, X; N, B, X; M, A, C, Y; and N, B, C, Y. The



box is somewhat large and of an awkward shape. On the other hand, it confers great freedom of choice in the gear ratios.

Castor Sidecar Wheel.

Mr. Christiansen, of Copenhagen, protects a castor wheel sidecar, of which the side wheel is sprung by a quarter-elliptic. The diagram is self-explanatory. I owned a castor wheel sidecar some years ago,

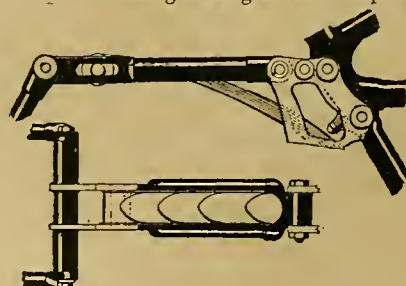


Fig. 6.—Christiansen sidecar springing. Pat. No. 122,860. 15/12/17.

of the laminated type for the rear frame. It is neat and light, but does not offer so wide a bearing to safeguard lateral rigidity as some of the two-spring patterns.

A Five-wheeled Morgan.

Mr. Horrocks, of Bolton, has a kindly thought for the man who buys a Morgan for his honeymoon, and finds his wife unwilling three years later to leave the twins at home. It serves equally well for the budding millionaire, who is just at the stage when the pony trap has been scrapped, and a Morgan has built up the business to a point at which profits

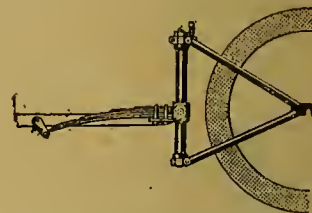


Fig. 7.—Rigby's springing device. Pat. No. 123,181. 21/2/18.

just do not run to a car. A light frame fitted with two side wheels is bolted to the rear of a Morgan or similar three-wheeler, suitable bodywork being fitted to convey one's family or merchandise, as circumstances may dictate. The side wheels act as supporting trailers, the original single driving wheel of the Morgan carrying on its duties secretly underneath the centre of the whole caboodle, whilst the vehicle is ostensibly

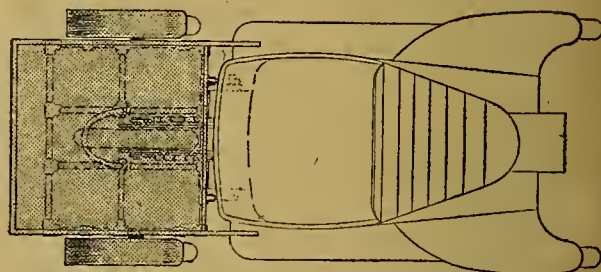


Fig. 8.—Horrocks's carrying device. Pat. No. 122,923. 13/2/18.

and am under the impression that British designers dropped this pattern because the castor wheel was so tiresome when the outfit was wheeled backwards.

Mr. Rigby, of the Royal Ruby Co., is still busy perfecting his spring frame. As the sketch indicates, he is a firm believer in using a single central spring

camouflaged as a four-wheeler. I have struck four-wheelers with only one driving wheel—but five wheels, only one of which drives! Fie, Mr. Horrocks! Still, it is a compromise such as Mr. and Mrs. Quiverful must sometimes make with poverty.

RE PATENTS GENERALLY.

Apropos patents and patentees, there appears to be considerable energy and money wasted on useless ideas just now. One can almost invariably tell a first patent. It is usually the most obvious way to overcome a difficulty, or too complicated to be worth while. In the former case, the idea nearly always has been tried and scrapped years ago. We do not wish to discourage young inventors; in fact, the reverse is the case, but there is no good purpose served by rushing to the patent agent with an idea before some enquiries have been made to ascertain whether the idea is new or not.

QUESTIONS AND REPLIES

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C.4, and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

The Local Taxation Licence.

? I recently sold a B.S.A. and sidecar to a friend. I paid the £1 road tax. Must the person I sold it to pay another £1 licence if it is transferred to his name?—YANTO.

Yes; the local taxation licence is not transferable, therefore the purchaser must take out a local taxation licence to enable him to use a motor cycle.

Sidecar Screen.

? I should be greatly obliged for your opinion of the 4 h.p. countershaft Triumph for sidecar work with hood and screen; as in the past I have as an owner been very well satisfied with this make, but only doubt if it will have sufficient power for my requirements.—E.H.W.

Naturally, in windy weather a hood and screen, if erected, would make a good deal of difference to a 4 h.p. machine, but perhaps a folding screen only, which could be set at a convenient angle, would not interfere with the running of the machine to any appreciable extent. Your machine is not lacking in power.

Overheating.

? I have recently purchased a 2½ h.p. two-stroke Villiers cycle, and am using benzole as a fuel, but I find that after running for about a mile the machine gradually stops. The fuel was coming through to the carburetter all right, and the jet was not blocked. I found, however, that the engine was exceedingly hot, and I removed the plug, which had a burnt appearance, as though it had been incandescent. When trying to start up again I found that the engine was very stiff, and remained so until I had allowed it to cool down. The engine is obtaining plenty of oil. Is it necessary to fit any extra air device for running on benzole, and do you think this state of affairs might be caused through a very dirty engine? Do you think it would improve matters to fit a Lodge aero plug?—C.G.F.

Either there is water in the benzole or you are using too large a jet. We think it is more likely that the former is the cause. Benzole can be used without any alteration being made, but a smaller jet is advisable. Certainly try the plug men-

tioned—this should be quite suitable—and see if the engine requires to be cleaned of carbon deposit.

Old Motor Cycle.

? I have just viewed a light-weight motor cycle—2½ h.p., single geared, Amac, and Bosch magneto, but without accessories. The engine is a De Dion, with overhead inlet automatic valve. If I purchase do you think: (1.) £20 is a too high figure? (2.) That replacements would be very difficult to obtain? (3.) I should have much trouble to sell, if I wanted to? (4.) How can I get the registered number transferred to my name? (5.) What licences must I have (I have my driving licence)? (6.) If I use benzole, do I require a petrol licence as well?—D.R.C.

(1.) Yes; you can get good modern two-strokes for that. (2.) Most certainly they would. (3.) Possibly. (4.) Write for registration transfer to the Carriage Department, Metropolitan Police, New Scotland Yard. (5.) Beside your driving licence you require to pay the £1 annual tax, registration 5s. (6.) No licence is required for benzole.



The Coventry branch of the N.M.C.F.U. in Badby Woods, near Daventry—a picturesque spot which has become very popular with Midland motor cyclists.

Firing Point on Twin.

? Do you know any reason why the front cylinder of a 45° twin-cylinder V twin engine should have the firing point somewhere about 1 in. later than that of the rear cylinder? I have always aimed at having the firing points to coincide. I believe that most V twins have a slightly different valve setting for each cylinder, but I have never met this difference in ignition point. I shall be extremely obliged if you can throw any light on it.—M.G.

We can only imagine that you have an engine of 45° to which has been fitted a magneto made for an engine with cylinders at 50°. Probably if you grind or otherwise alter the magneto contact breaker cams, you will be able to set the firing points to coincide.

Four-stroking.

? I have a 2½ h.p. two-stroke motor cycle with Villiers engine and Senspray carburetter. After ticking away nicely from starting, the machine begins to four-stroke with intermittent periods of correct running. I have a 30 jet, and the timing is correct. The machine is run on the petrol system. What can I do to remedy the four-stroking? Can you also tell me what proportion of oil I should mix with a gallon of benzole, and whether four-stroking is harmful? The machine gets along nicely even when four-stroking.—L.P.

Nearly all two-strokes will four-stroke under certain conditions. The only way to improve the running is to experiment with different combinations of jet and choke tube in the carburetter. You cannot alter the valve setting without filing the ports in the cylinder and piston. Magneto timing should be set well advanced. Clean the engine by removing the carbon deposit. The proportion of oil to petrol is usually one part oil to sixteen parts petrol.

Dismantling an N.S.U. Gear.

? I have bought a second-hand N.S.U. two-speed gear, and, not knowing how it works, I should be glad if you would let me know how to take it down and re-assemble it? What gear ratio does one get from it? If the top gear is 5 to 1 what is the second gear?—G.W.W.

First remove the cross pin. This enables you to unscrew the sleeve nut, which has a right-hand thread. Having unscrewed the nut, the gear is free to be taken off, and this is best accomplished by putting two large screwdrivers—one each side of the pulley flange—between the flange and the crank case, and levering it off in this fashion. Before the gear is taken apart insert a bar, which will act as a dummy engine-shaft. This can then be gripped in a vice, and it prevents the balls from falling out. In assembling the gear the balls are put in a race covered with vaseline, and they are thus held in position. The gear is fastened on to the engine-shaft by the sleeve nut. If the gear tends to stick after releasing this nut it should be tapped off by means of screwdrivers in the manner described. Excessive force must not be used or the flange will break. A sharp tap should

suffice. It should be assembled on a dummy engine spindle in a vice. Release the lock nut with the special key (left-hand thread) through the slot in the pulley; then adjust the flange to the required position (the flange has a right-hand thread), then secure the lock nut. If the top gear is 5 to 1 the low gear would be about 7½ to 1.

Misfiring.

? I have a 7.9 h.p. Indian motor cycle and sidecar, which misfires badly in the back cylinder when running at slow speeds; the trouble, however, is not so pronounced when the throttle is opened. The cylinders and combustion heads have been cleaned of carbon deposit, all joints are air-tight, new high-tension wires have been fitted, and plugs and contact points have been cleaned. Can you suggest anything further that can be done, and advise me in what way it is possible to inspect the brushes of the magneto, which is a Dixie?—F.G.T.

The misfiring in the back cylinder is probably due to oil or grease on the secondary spool. The front carbon brush holder should be removed by detaching the holder cover, which is held in position by two small screws. If a piece of rag soaked in petrol is inserted in the opening and the engine turned slowly the segments on the spool can be cleaned. Should the spool, on examination, be found to be clean, there may be a defect in the condenser or the coil winding, in which case the magneto should be returned to the Hendee Manufacturing Co., Ltd., Indian House, 366-368, Euston Road, London, N.W.1, for repair.

Timing an a.o.v. Engine.

? I have just purchased a 6 h.p. twin Rex motor bicycle, which has suction inlet valves. The valve timing is somewhat incorrect, and I should be pleased

if you would enlighten me on the following: (1) What is the correct method of valve timing where the inlet valves are automatic? (2) What is also the proper magneto timing? (3) Should both suction valve springs be the same tension and the same valve clearance? (4) How can one tell when the inlet valves are operating? (5) Will the correct exhaust valve timing prove sufficient? (6) What do you advise for making the cylinder joints air-tight?—P.

(1.) You need only concern yourself with the timing of the exhaust, which should be as follows: Set the valve to close just after the completion of the exhaust stroke. It will then commence to open when the piston is about one-seventh of the length of the stroke from the bottom of the firing stroke. (2.) The magneto should be timed in the following manner: Place the piston exactly on top of the compression stroke, and connect up the magneto with the points just about to break and the ignition lever two-thirds retarded. (3.) Yes, this should be so. (4.) Only by the fact of the engine stopping, telling you that the automatic valve may not be working. (5.) This question has been already answered. (6.) The only means is to keep the inlet union nuts absolutely tight and the surfaces clean.

Leather Belts.

? I have a 6 h.p. combination driven by a 1½ in. Whittle belt from an N.S.U. gear. Will you please advise me as to how to treat this belt to get the best driving effect from it? I have scraped the dirt off, but am afraid to put any dressing on it, for I think that softening may cause it to stretch. The pulley is in good order. Is this the best belt obtainable? The drive is not satisfactory, but I think it is impossible to obtain satisfaction with this drive.—J.G.

Having cleaned the grit from the belt, you might treat the leather links with collan or castor oil, which will prevent slipping if your pulleys are not worn. This will improve the leather, and will not cause the belt to stretch. The belt can only stretch through wear of the metal links. The belt is quite a good one.

READER'S REPLY.**Difficult Starting.**

Has your correspondent "H.T.V." tried opening the compression taps and turning the engine over before injecting petrol? I have found it quite successful.—CHULT.

RECOMMENDED ROUTES.**CAMBRIDGE TO ROCHDALE.—H.B.**

Cambridge, Huntingdon, Thrapston, Kettering, Leicester, Loughborough, Derby, Matlock, Bakewell, Buxton, Chapel-en-le-Frith, Stalybridge, Oldham, Rochdale. Approximate distance, 165 miles.

FARNHAM TO BIRMINGHAM.—L.J.G.

Farnham, Guildford, Chertsey, Staines, Windsor, Slough, Maidenhead, Henley, Dorchester, Oxford, Woodstock, Enstone, Chapel House, Long Compton, Shipston-on-Stour, Stratford-on-Avon, Henley-in-Arden, Birmingham.

CARDIFF TO LONDON.—S.R.II.

Cardiff, St. Mellons, Newport, Chepstow, Lydney, Newnham, Gloucester, Cheltenham, Andoversford, Northleach, Witney, Oxford, Stokenchurch, High Wycombe, Beaconsfield, Uxbridge, Brentford, Clapham. Approximate distance, 165 miles.

EVESHAM TO WALLINGTON.—R.B.H.

Evesham, Broadway, Moreton-in-the-Marsh, Chipping Norton, Enstone, Woodstock, Oxford, Dorchester, Nettlebed, Henley, Maidenhead, Slough, Windsor, Staines, Kingston, Sutton, Wallington.

CHESTER TO GREAT MISSENDEN (BUCKS).—J.W.B.

Chester, Tarporley, Nantwich, Woore, Stone, Rugeley, Lichfield, Stonebridge, Coventry, Southam, Banbury, Aynho, Bicester, Aylesbury, Great Missenden. Approximate distance, 165 miles.

SOUTHSEA TO ERITH (AVOIDING LONDON).—W.W.

Southsea, Cosham, Havant, Petersfield, Hindhead, Godalming, Dorking, Reigate, Redhill, Godstone, Westerham, Otford, Eynsford, Farningham, Dartford, Erith.

THE MOTORCYCLE

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Valve Position.

FASHION imposes its will on more things than ladies' dress, and a few notes respecting fashion as applied to valve design will be interesting. In the old days of the automatic inlet valve, operated by the suction of the engine, both valves were carried in a pocket, the inlet over the exhaust and situated in the inlet dome to which the induction pipe was attached. This system was good, but not ideal; it had the effect of cooling the overheated exhaust valve by means of the intruding cold gases impinging upon it: also there was no opportunity for an air leak past the valve stem. Both of these are very real advantages, not to be lightly abandoned. Moreover, the valve pocket was only about half the size which is necessary in the case of side by side valves or where the T shaped cylinder is employed.

When both valves began to be operated mechanically, the side by side method was very naturally adopted owing to the ease with which the valve gear could be constructed for such a system, and the advantages of the mechanically operated inlet were so great compared with the suction valve—especially on twin-cylinder engines, though, strangely enough, it was used on singles for a considerable time before the twins followed suit—that it more than compensated for any advantages which the other position conferred. And, moreover, it is to-day still used in a great number of very excellent engines.

Most American engines had overhead inlets until quite recently, when a very popular engine reverted to the side by side principle. Side by side valves with a cap over each are more accessible than any other type, but this advantage is becoming with every new improvement of less and less value. As the material of which valves are constructed becomes more suitable to its purpose, so does the need for accessibility diminish. Improved cooling, whether by means of water—and we hear excellent accounts of a new water-cooled engine of quite small size and

large horse-power—or the more scientific use of metals having high conductivity and greater attention given to design, also tends to the same end and greatly enlarges the periods for which exhaust valves can run without being ground.

Another method of arranging opposed valves, and one very suitable for use in flat twin engines, is to place the exhaust valves over the inlets instead of the reverse. This has the advantage of removing the hot exhaust pocket farther from the cylinder, and thus not only assists greatly in the cooling problem, but helps to avoid distortion by allowing the cylinder to be more symmetrical in shape and also enables a shorter inlet pipe to be employed—no mean advantage when the pipe is exposed to a blast of cold air.

Now that valve breakages can be ruled out by the use of unbreakable steel (tungsten or stainless), overhead valves are coming into their own, and are likely to become more and more popular during the next few years, either in their usual form of separate inlet and exhaust valves, or in the compound form in which the inlet surrounds the exhaust or *vice versa*. This has the advantage of the cool gases being used to extract heat from the exhaust valve, which would tend to very efficient vaporisation, but it does not give the designer the same latitude in the matter of valve timing as is enjoyed when the valves are in no way connected. Overhead valves can be set in a hemispherical head, and, if combined with a piston having a concave top, they admit of the best possible form of combustion chamber and are undoubtedly more efficient than any other type. There is perhaps more difficulty in rendering the valve gear silent with overhead valves than with the older types, but this should not be beyond the wit of our manufacturers.

Another point in which the overhead valve presents a difficulty peculiar to itself lies in the lubrication of the valve gear. This can be done by enclosing the operating rod in a tube through which oil can pass from the engine or by wick lubricators.

A Steel Sidecar for Lightweights.

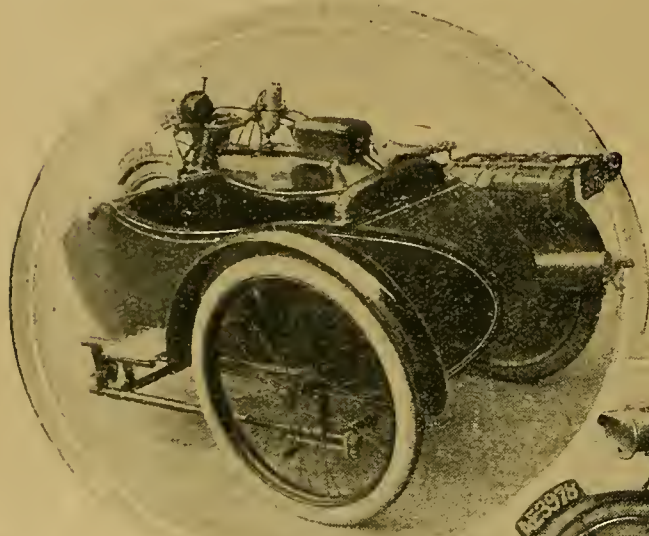
A New Design of Sidecar Body embodying Aeroplane Practice.

DETAILS of a neatly designed sidecar, which has recently been patented, have been forwarded to us by the builder, Mr. W. F. Baxter, 180, Wells Road, Totterdown, Bristol. The body is built on aeroplane lines, as the framework is constructed of silver spruce, all members being strutted and braced together, ensuring great rigidity and light weight. The whole of the body is covered with polished steel, while the beading is also metal. The body is consequently waterproof, and has excellent lines. Round the top of the sidecar is a polished mahogany beading which

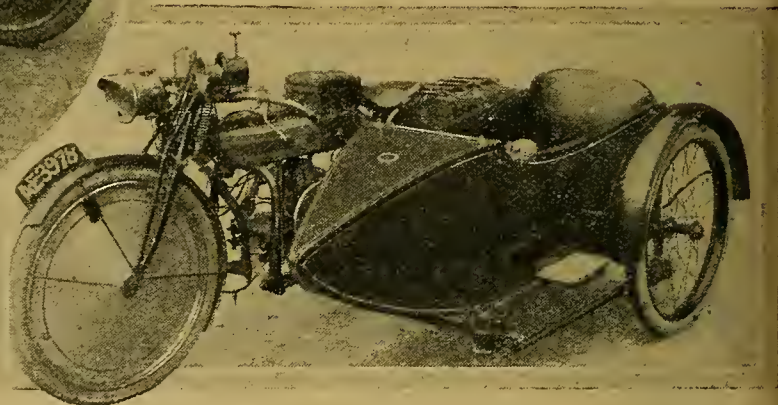
protects the upholstery from wear. The upholstering is well carried out, and the spring cushions are covered with Rexine.

Both the seat and back of the body are movable, under the seat there is a good tool box, and we understand that provision is being made for carrying a petrol tin at the rear. The back is adjustable, and may be fixed in either a sloping or an upright position. It will be noticed that there is no side door but a convenient step, by means of which the passenger can have easy access to the sidecar. The mudguard is of ample dimensions, and is attached to the body so that it is sprung and there is no chance of its supports breaking.

The sidecar chassis is well made, and there is also a stand which considerably simplifies matters when attention to the sidecar tyre is needed. Coil springs are adopted as the method of suspension, which is found to be quite satisfactory. The weight complete is said to be 110 lb., so the sidecar is suitable for machines of 3 h.p. and upwards. It is hoped that arrangements will be made shortly to make the sidecar suitable for any standard make of motor cycle. Bodies are also supplied for existing sidecar chassis.



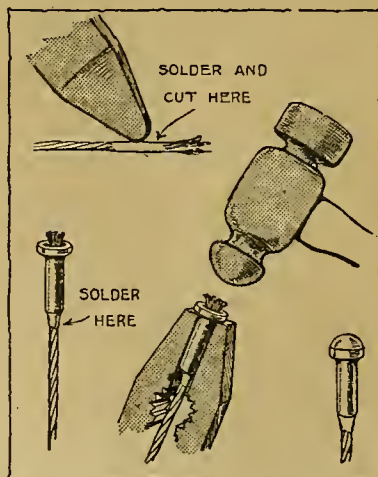
A steel sidecar body built on aeroplane lines, all frame members being strutted and braced



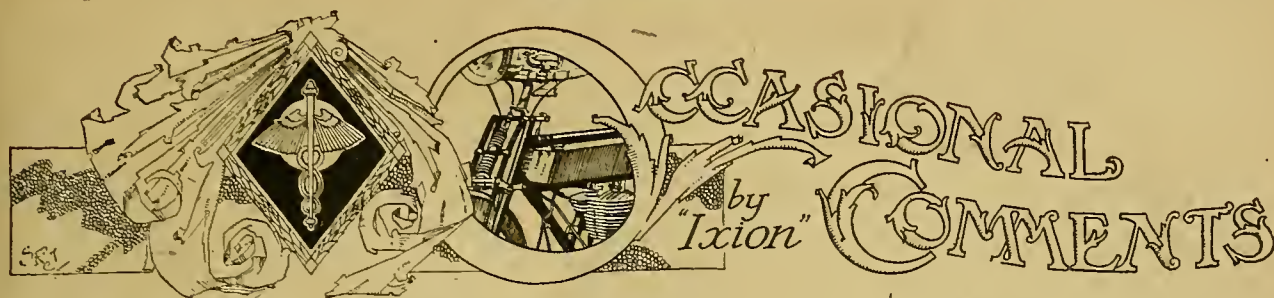
Fitting Bowden Controls.

THERE are many facts concerning the fitting of Bowden wire of which the average reader is not aware, and the following hints may be of interest to motor cyclists who do their own repairs, and of value to them in keeping their controls in order.

First of all, the rider must remember that the inner member of the mechanism—that is to say, the twisted wire—should be tinned or soldered before it is cut, and unless this is done the strands will become untwisted and the wire generally unmanageable. Once tinned the wire can be cut by a pair of wire cutters. The brass nipple is then slipped over the wire, and the end of the wire nipped flat to prevent the former



slipping off. The nipple and wire should then be treated with a non-corrosive soldering fluid, and solder should be applied to the back of the nipple. The nipple should then be held in a pair of pliers in the manner illustrated, and the flattened end burred over with a blob of solder. The wire having been well greased with vaseline, the outer member must be slid on, as well as the adjustable stop, and in fitting up the control it should be seen that the lever is in the "off" or closed position. Before fixing finally the wire should be pulled taut, and the place for the nipple marked with a lead pencil. Solder the nipple tightly in position, test the tension, and if this is correct cut the wire.



Get Estimates for Your Repair Jobs.

I SHOULD advise readers not to give orders for any motor cycle repairs without first obtaining a written estimate, in which case they will probably be dumbfounded at the figures. We are all aware that wages have risen and hours have shrunk, but these are not the only items which affect the matter. A friend of mine has just received a bill exceeding £22 for a comparatively minor repair job; the bill includes in round figures £12 for material and £4 for labour, the balance being invoiced as 25% for "establishment" charges, and a percentage on the lot to cover increased costs. The real spike of this portentous account is the "material," which consisted of certain obsolete 1914 parts, to an original value of perhaps 50s. retail. The firm has carried this dead stock for five years, and wants interest on its locked-up capital. In addition, the stock of obsolete spares is probably getting low: perhaps the bits have been allowed to rust during the war; and, finally, the makers may have lost their patterns in the scurry of munition work, and foresee a day when they will have to choose between offending old clients or tackling a very costly job. There may or may not be just cause for complaint in the particular invoice which I have used as an object lesson. Be that as it may, it is rather a damper for buyers of spares. This particular job would not have been worth much over £5 in 1914: in 1919 by putting up the price of spares 400% or so, and saddling all the other percentages on this hugely inflated item, a small repair job is expanded to figures suggestive of buying a second-hand 'bus. So take my tip, and get a written estimate.

Insurance.

THE last paragraph is symbolic of vastly increased charges to be encountered in every item of motor-expenses. For example, the insurance companies have not yet frightened us with any very formidable rise of premiums. Perhaps—like ourselves—they have yet to discover what manufacturers and repairers intend to charge for jobs during 1919. Perhaps they propose to break the dreadful news gently, capture our premiums, and then whittle down the benefits or ask for a war bonus. But the insurance companies are doubtless paying double salaries, like everybody else, and will find every liability in their policies twice as expensive as it used to be. It looks as though complete "cover" for a motor cycle is going to cost as much as a light car policy involved five years ago. I write in no alarmist spirit: I merely observe that plenty of people who can no longer afford to motor on the old scale are clinging to a hobby which is now beyond their means.

On Prices.

I THINK it is time certain firms in the industry realised that unless they are very careful they may kill the goose that lays the golden eggs. So far as current prices of 1919 models go, I have no word of complaint to utter. For example, if the 1914 3½ h.p. Tyre-eater cost £65, £130 would be a fair 1919 price for a similar model: and we are able to buy the 1919 model at £85 by reason of three special factors, namely:

- (1.) The 1914 price admitted of profits which the firm can afford to cut.
- (2.) Production has been cheapened in certain respects, which partly balance the increase in the cost of labour and material.
- (3.) Large munition profits in many cases enable a firm to work temporarily to a reduced margin of profit.

So it is a tenable theory that most of the factories have adopted a wise and self-restrained policy. This will be in vain if their example is not followed by all the auxiliary businesses which complete the industry. That £22 bill of which I wrote in a previous paragraph is an eloquent example of the stupid policy. Riders' salaries or wages may have increased 100%, but that increase is the maximum. The invoice in question has swollen 400% or 500% since 1914. If garage, insurance, fuel, hotel bills, club fees, accessories, repairs, spare parts, etc., are all going to jump up even by 150%, there will be a huge slump in motor cycling and a most dangerous and difficult time for the industry. This can only be avoided if *all* traders tackle their jobs in the spirit of "What is the least I can charge!" (which is—approximately—the manufacturers' policy) instead of "How much can I make?"

In a Nutshell.

THE basic facts of the average rider's position are:

- (1.) Salary up 100% (maximum).
- (2.) Domestic expenses up 120% (minimum).
- (3.) Motor cycling expenses up 7%.

It is obvious that if motor cycling expenses are kept down to a rise not exceeding 100%, which is approximately legitimate, continued ownership of a machine will still be a very tight squeeze for many riders. If motor cycling expenses rise 150%, thousands will be forced to relinquish the hobby. In any case, the public will soon be shaken out of the "easy money" atmosphere which the war has engendered, and a slump of some sort is inevitable within a very few years. Thus, on all grounds, any industry or any section of an industry which profiteers to-day will be sick and sorry to-morrow. The 1914 £65 'bus at £85 in 1919 is a sane signal: if the auxiliary sections

Occasional Comments.—

of the industry can put through a similar policy *mutatis mutandis*, the sport can carry on, and the inevitable slump, when it comes, will just be a lean time and not too serious.

C.G.

ANYBODY who is concerned with aircraft nourishes a profound reverence for the centre of gravity. On motor cycles its location has usually been a mere accident. Werner Bros. in 1899 carried their engine on a small scaffolding built out above the front wheel. Raleighs copied this bad example on their first machine—I think the belt expert's yearning for widely-spaced pulley centres was the prime cause. Anyhow, these machines used to throw you off, jump on top of you, and pummel you. The early "trikes" were even worse. Rider, engine, and tanks were concentrated at the extreme rear with lots of weight *behind* the rear axle: the front wheel was carried on an outrigger all by itself in front, like the elevators of a longhorn Maurice Farman. These "trikes" would throw a back somersault if you set them at a 1 in 5 grade. Gradually matters improved; 28in. frames, triumphantly heralded by one thoughtful Coventry firm in the interests of tall riders, were washed out. But on lots of machines the C.G. is still rather funny. Its location must always be beset with difficulty when you carry a heavy rider rather far back. But reflect when the engine is placed in such machines as the Scott and the new A.B.C.; and then test the general steering and road-holding qualities of these two unconventional layouts.

Boxing in the Engine.

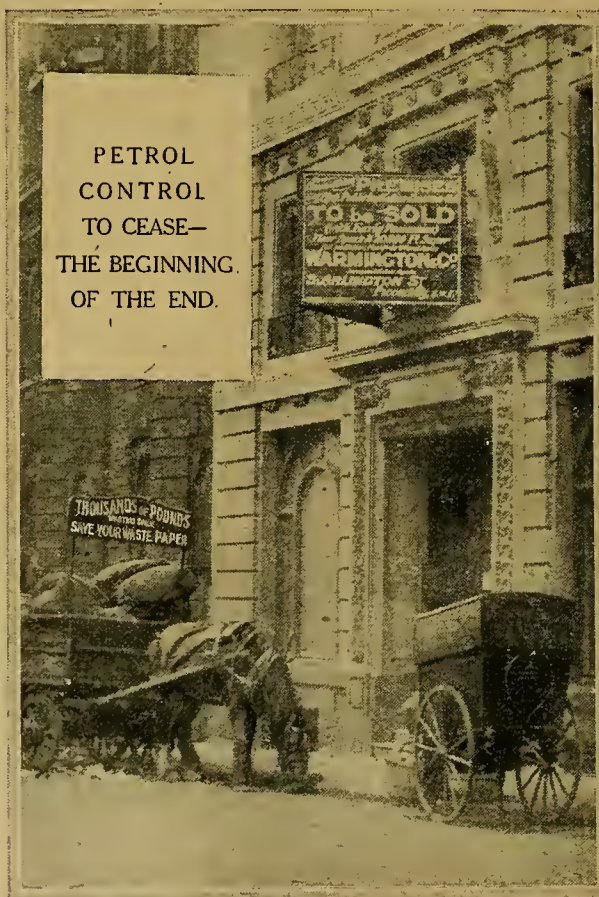
EVERYTHING is moving towards an ideal often quoted by amateur riders. In certain cars—e.g., the four-cylinder Sizaire-Naudin—the engine closely resembles a suitcase set on edge: there are no naked valves, springs, rods, etc., to be seen when the bonnet is lifted. Since a bonnet enshrouds a car engine, such cleanliness of external design is a mere matter of taste where cars are concerned. On motor cycles, where every speck of oil, mud, or dust has to be removed when selling day comes, and is a horrid eyesore in the meantime, an engine bonnet is a practical matter. Refer back to the photograph of the 3 h.p. A.B.C. on page 242 of *The Motor Cycle* for

March 13th and the sketch of the frame given two pages later. It is obvious that the addition of a couple of hinged side shields would cover the nakedness of the works without interfering with cooling. In a current patent J. L. Norton proposes to cowl in the engine with a different motive—i.e., to equalise the front, lateral, and rear cooling. Various pressed steel frames, now being protected, all point in the same direction. Sooner or later, I fancy, motor cycles will come to resemble the hull of a small boat with a fork and wheel projecting from the bows. Then we shall achieve real ease of cleaning.

No Prize Offered.

AS a mere scribbler, I take no stock of gas velocities through inlet valves. I do not know (or care) what a B.T.U. is. It is all one to me whether the ηp of my pet engine is 40 or 200 lb. But I always thought the secret of the aggravating nature of flat twins was "wrop in such mistries": and as a mere layman I stood deferentially aside and meekly accepted the goods which the trade handed out with as little grousing as possible. I refer particularly to the fact that a flat twin engine can either push a rev. counter up to 4,000 or pull a 4 to 1 gear like a cabhorse on its last lap for the mews: but that one

and the same engine never does both. Yesterday a member of the staff burst into my office with the glad news that he had just tried out a new flat twin which combined both *desiderata*. I took down my hat, pocketed my engineers' pocket-book (I keep one on the desk to impress callers), tucked a slide rule into my breast pocket, and clamped a mechanical dictionary in my left armpit. Thus equipped I trotted forth to interview the successful designer. He frothed surds and cosines at me for half an hour by the clock, referred at great length to differential and integral calculus, discoursed learnedly on the precession of the equinox, and finally wound up with a discussion on the value of spectrum analysis. I dipped stealthily into my works of reference at intervals, when he let fly a particularly appalling polysyllable; but in the end I threw myself on his mercy. "Can you tell me simply how it is done?" "I do not know myself," he replied, "and what is more, I want to alter the valve timing, and it may go phut again!" So that's that.



The offices of the Petrol Control Department are being advertised to be sold or let. Should the end of officialdom in connection with the purchase of petrol come in a fortnight's time no one would accuse the Government of being unduly premature considering the great stocks of fuel in the country. *The Autocar* stated definitely last week that control of petrol is to cease.

HILLS ON WHICH I HAVE FAILED.

Some Accounts of Strenuous Motor
Cycling in the Old Days.

By VETERAN.

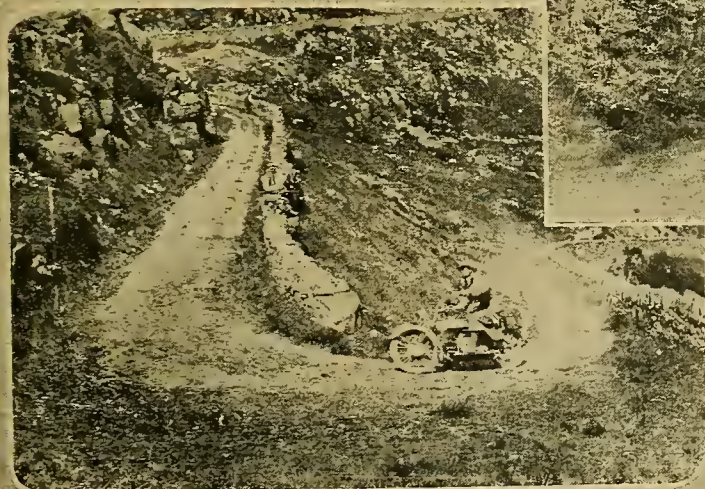
THE modern hill-climb strikes us surviving pioneers as very small beer indeed. If you are touring, you merely drop down one gear, and perhaps another towards the summit; but when you roar over the crest and past the danger-board, you usually have nearly half throttle in reserve, and very possibly you have never used your emergency gear at all. In a timed competition climb, it is not a question of whether you will get up or not, but whether you can get round the corners at the speed of which your mount is capable. In a six days, the promoters can only introduce an element of chance by switching the entry up perpendicular zigzag goat tracks; and even at that everybody has plenty of engine power in hand. Success is only a matter of whether you can steer round corners resembling a draughtsman's set square, whether the back tyre will grip on sliding shalebanks or six inches of camouflaged morass, or whether some ass stalls just in front of you on the worst bit.

Times have certainly changed since I first rode 200 miles to try Sutton Bank. On that—for me—historic occasion I took along two spare pulleys, two spare belts, and a pulley drawer. I got over the 1 in $3\frac{1}{4}$ bit at the Trough at the first time of asking, but my engine over-heated to such an extent in the effort that it promptly conked out on the easier knuckles round the bend. I eventually completed the ascent in penny numbers.



Amulree, a famous Scottish test hill, which, with its hairpin bends and loose surface, presents a formidable test for man and machine.

Twelve months later I returned with a better engine, a pulley little larger than a florin, and a belt of extraordinary tenacity. With this outfit I made a clean but odorous ascent, accompanied with a stink of burning leather on the upper portions. Prior to that year, and for several years afterwards, we hard riders never made a long cross-country trip without first referring to a Gall and Inglis contour book—my copies are tattered and dog's-eared. If we saw a



(Left) The famous hairpin bend on Applecross Hill.

(Right) The second bend on Kenmore, a hill on which others besides "Veteran" have failed.

steepish line on the contour grades, or a "1 in 7" in the appended notes, we got out our $\frac{1}{2}$ in. flat maps, and invented a *détour*. Even at that, we performed various ritual ceremonies at the foot of such ascents as Dashwood and River Hill. We paused—nominally to light a pipe, actually to let our distorted engines cool down. We drained the hot thin oil out of our crank cases. We renewed our belts, and hammered down our adjustable pulleys with spanners and stones. We unhooked our belts, and extracted 5 in. lengths of belting to balance the gear reduction.

Hills on which I have Failed.—

Finally, we drew deep breaths, and, with palpitating hearts, stormed at the rise. As the pace slowed, we cocked our ears at the exhaust, and presently our wiry, muscular ankles vanished into a blur resembling an electric fan in full blast. This performance was facetiously known as "L.P.A." (light pedal assistance). The last reserves consisted of jumping off and sprinting alongside the conking bicycle; but only exceptionally sturdy fellows were equal to this after a few hundred yards of "L.P.A." For myself, being of a palsy habit of body, I confess that I never combined "L.P.A." and "running with it" in the same instalment. With rare presence of mind I would "L.P.A." until an intolerable weariness in my calves and ankles coincided with a glimpse of some little sheep-track or rabbit alley streaking off obliquely up the side of the hill. Then "L.P.A." had just about served its turn. Remember the conditions of "L.P.A." were:

1. 6½ in. cranks.
2. 60 in. gear.
3. 20 in. fork-to-pedal reach.
4. Heavy waterproof clothing.
5. Road speed of 25-15 m.p.h.

In other words, one "ellpeeaeed" without any support, standing on the pedals. As exhaustion grew, one foot would slip off the pedals, and the tense rider collapsed with a sensation like that of a ripe plum dropped on a barbed wire fence. So the next act was to prop up the bicycle and pause by the roadside, gasping and palpitating. Breath recovered, I would carry the bicycle up the oblique pathlet through the furze and whinberries, reverse the bicycle by a *tour de force*, and roar down again on to the main road for a repetition of the entire process. Before now it has taken me a solid hour to get up Sunrising, Sutton, or Shap or Trow: and even at that I was a better man than most, for I speak of days when the majority of riders knew such hills only by repute, or by riding to the top from the right side, and sniffing timidly down them. About the time that other hardy spirits and I used to organise week-end jaunts to those precipices (as we then regarded them), there was a heated discussion in the M.C.C. Committee as to whether or not the first London-to-Edinburgh run should be held, some experts maintaining that the percentage of failures would strike an irreparable blow at the hobby. Yet, as every good roadman knows, there is hardly a bump on the whole 400 miles of the Great North Road up which a motor scooter could not

pull a coachbuilt sidecar with a passenger. Two years or so I had acquired quite a county reputation by riding a 1¾ h.p. Ormonde minus pedals up a slope that might be likened to 800 yards of Ludgate Hill: yes, and I won a cool fiver by doing it!

The Coming of Variable Gears.

The real snag came when sundry leading clubs began to support *The Motor Cycle* campaign in favour of variable gears. Incredible as it sounds, the trade frowned on the movement. With the exception of a few

firms—the P. and M. two-speed, the "Anglian" dog-clutch three-chain drive, and Hooydonk's Phoenix hub, no factory offered anything but single gears. This journal did much to educate public opinion and render it articulate. At last the Edinburgh M.C.C. leapt into the breach. It endorsed our policy that a roadworthy bicycle should be able to climb any main road hill in the district where it is used. So the Scottish Trials were sent up Glencoe, Rest-and-be-Thankful, Amulree, Cockbridge, and



Rest-and-be-Thankful, a Scottish hill over four miles in length, between Arrochar and Inveraray.

other stiff climbs, which no A.C.U. Committee of that era dare have mentioned.

Piteous sights were witnessed. I have seen athletes "cooked" at every conceivable sport—boxing, rowing, running—but I never saw men done quite so brown as some of the plucky riders in the earlier Scottish Six Days. Happy was the entrant who belonged to a maker's team or an unofficial team of two or three pals. The duo or trio could share the arduous toil of pushing one machine up, and come down again to fetch the remainder. The policy paid beyond our dreams. Manufacturers were stung by the ridicule heaped on their miserably inadequate designs. The A.C.U. and lesser English clubs awoke to find that the Edinburgh sportsmen had stolen their prestige away, and that the Scottish Six Days was the blue ribbon of the year. Pathfinding patrols were organised from Piccadilly, and the trade realised with a shiver that variable gears had *got* to come. So to-day the motor cycling novice can buy any standard touring machine and go where he will on it: he would not fail on any hill of less formidable calibre than Kenmore or Applecross: and, if he fails there, he must blame himself and not his mount. As he roars blissfully up tortuous grades of 1 in 5, let him remember that he owes his tickly sensations to forgotten men who sweated and strained to teach the motor cycling world the folly of single-gears. *Moi, qui vous parle*, have pushed 2 cwt. up perhaps 200

BIRMINGHAM M.C.C. RELIABILITY TRIAL.

THE

3 $\frac{1}{2}$ H.P.

ARIEL

COMBINATION,

ridden by Mr. F. J. Watson, won a

GOLD MEDAL

Also a

SILVER MEDAL

was won by Mr. L. Newey on a 3 $\frac{1}{2}$ h.p. Combination.

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Hills on which I have Failed—

miles of single-figure gradient, all told, since 1903: and, when my toes turn blue in bed on a winter night, I grimace as I recall how I did in a valve of my heart years ago: for the doctors have still to learn the trick of grinding in that kind of valve. And there are others. Speaking from memory, I fancy only three riders out of the entire entry climbed Amulree in the saddle the first time we sent the Scottish Trial up that lovely hill.

If I may digress to point a moral, there is absolutely no novelty in the principles of the average 1919 gear box, be it of the hub or countershaft variety. You may wangle a patent for one even now, but for decades past such patents were only to be had by grafting some tuppenny ha'penny detail on to an antique gadget, which Boadicea probably used on special chariots reserved for mountain warfare. The trade got into a groove over single gears: and it was jerked out by a little Scottish dynamite and journalistic fulminate of mercury. We might just as well have had one, two, or three-speed gears in 1903. Clubs, press, and users must protect the industry from getting bogged in other grooves. The price groove. The weight groove. The rigid frame groove. The four-hours-to-clean groove.

I notice I have yet to mention climbing with a passenger. Well, it simply was not done. Of course, it could not be. The old quads were an exception, certainly. They hailed from France. The French engineers may at least boast that they had heard of the epicyclic gear as long ago as 1900. De Dion and Peugeot quads came over fitted with Bozier and Dupont epicyclic two-speeds: Dennis, Enfield, and other British firms sent across and bought some. I admit that these quads were not exactly perfect. Eight miles an hour up River Hill was good going: but it had its advantages, for, if the grade stiffened

or the engine was out of tune, you and your lady stepped overboard, without fuss or scurry, and walked alongside at 4 m.p.h. When the old 'bus slowed to 2 m.p.h., you could push. Legend has it that a weary old quaddist in the Seven Oaks district used to help his quad up hill by pulling up the spokes—!! But the noise! A marine store in an earthquake was a dim, religious hush compared to it.

Then the quad went out and we took to the trailer—behind a single gear, of course. I need only say that slim, *petite* damsels caught our fancy: the rosy-cheeked country maid or hockey lass we were obliged to deem somewhat blowzy. Look up the records of the first M.C.C. Interclub Team Competition. After many searchings of heart, the management compelled each sextette to include one passenger machine. A potty course was chosen. I fancy the brief slope up to Aynho Station in Northants was the only climb. But the clubs had a rare job to unearth

passenger combinations which could look at it: and the favourite stunt was a big racing machine and trailer with two midget jocks for its crew. The tricarb boom of 1906 was an interlude. Some of these machines could climb to beat the band. But they went pop just as the cycle car did a few years later. Meantime, the moral was being mastered. Variable gears are all but universal. They have knocked much of the sport out of motor cycling. They have camouflaged certain grave shortcomings in the petrol engine. They tend to degrade motor cycling into a utilitarian locomotion



Sutton Bank, Yorkshire. This hill at one time was accounted most formidable. Even in these days of speed feats it is a hill which requires careful negotiation.

for duffers. But they have at least given Britain's sons the freedom of Britain's finest roads: and that is no mean achievement.

As a postscript let me justify an ill-chosen title by saying that I do not think there can be any hill in England, Wales, or Scotland on which I have *not* failed.

THE SUPPLY OF BENZOLE.

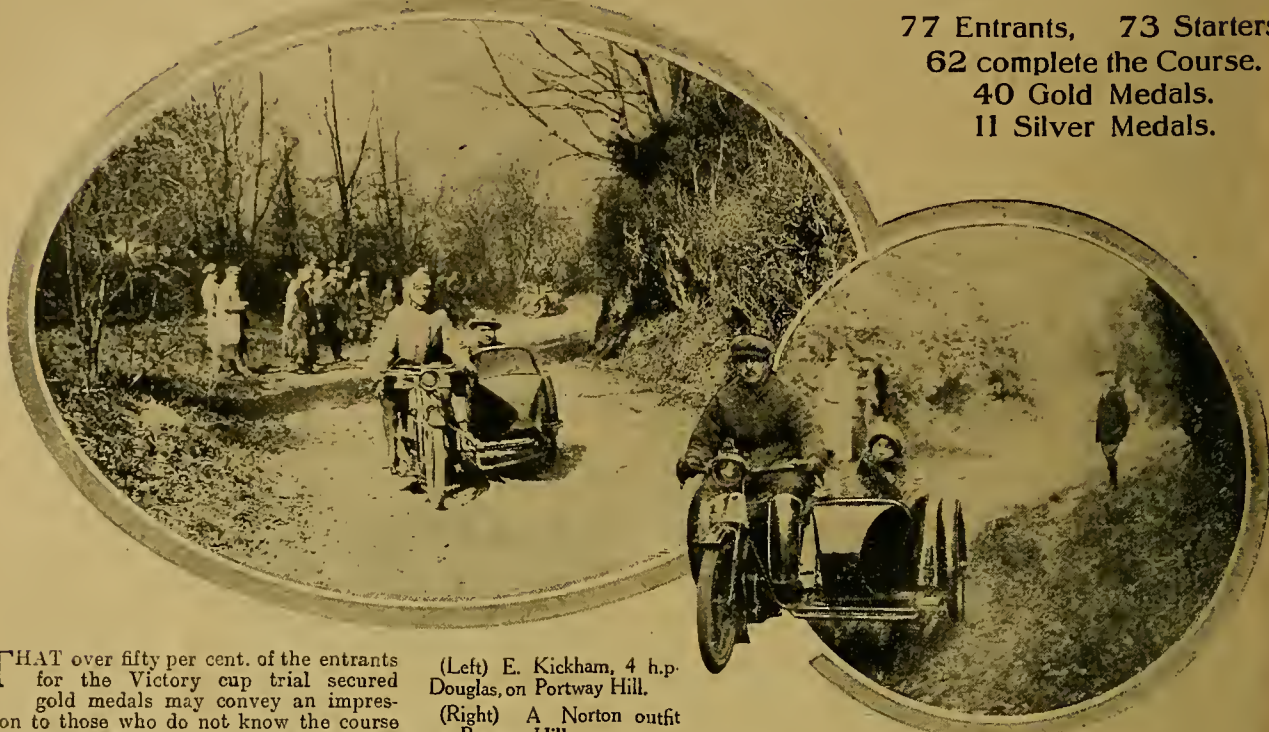
The British Motor League has made arrangements to supply its members with benzole of the best quality in any quantity at the very moderate price of 2s. 6d. per gallon, which is 2d. per gallon cheaper than benzole can be obtained usually in fifty-gallon drums. At this price, the benzole, which is guaranteed

to pass the National Benzole Association's tests, is delivered free to any address in London, or, in the case of country members, at any railway station in England, Wales, or South Scotland, likewise carriage free. Particulars may be obtained from Mr. Hugh Scott, 28, Fleet Street, London, E.C.4.

THE VICTORY CUP TRIAL ANALYSED.

Victory Cup won by a Rider of a Two-stroke Lightweight.

77 Entrants, 73 Starters.
62 complete the Course.
40 Gold Medals.
11 Silver Medals.



THAT over fifty per cent. of the entrants for the Victory cup trial secured gold medals may convey an impression to those who do not know the course that the reliability and power of the modern machine had been under-estimated by the Birmingham M.C.C., who organised the trial. It has, however, been proved before that, where it is possible for a wheel to obtain grip, the machine of to-day, and even of 1914, will climb with success, provided the rider can handle it.

The roads were dry, and, except for the dust, which was very trying, conditions were ideal for the competitors. Had it been wet, we think the results would have been very different; the first hill and Rising Sun alone would have considerably reduced the number of gold medallists.

It is perhaps only fair to the makers of the machines that failed, to say that the personal element was responsible for more failures than mechanical troubles.

The course was a well-known one, and for several years before the war we watched the gradual improvement of motor cycles on the same hills, excepting Beacon Hill—a narrow, deeply rutted lane near Bromsgrove. The other hills were the Old Wyche Cutting, Portway (near Painswick), the famous Birdlip, Rising Sun (or Gambles Lane, to give it its local name), and Sudeley.

Competitors were credited with 100 marks at the start. There were four non-stop sections, to stop in any of which meant the loss of 12 marks, while for failures on the test hills competitors were debited with losses in proportion to the severity of the hill. Failure on Beacon Hill represented 11 marks, on the Old Wyche 6, Portway 8, Birdlip 10, Rising Sun 7, and Sudeley 8. To qualify for a gold medal, competitors had to secure 97% of the cup winner's marks, while lightweight riders were allowed to

(Left) E. Kickham, 4 h.p. Douglas, on Portway Hill.

(Right) A Norton outfit on Beacon Hill.

drop to 88%. Silver medallists could lose 8% marks, and in the lightweight class 17%. The winners of the cups were decided by a speed judging test over a distance of two and a third miles.

The condition of Beacon and Rising Sun was very bad. The latter was particularly rough.

With so many new-comers to the pastime, it is perhaps natural that a great number of our readers should be interested in the performance of the machines in the first of the post-war trials to be held in Great Britain, and, appreciating this, we have analysed the results as below:

A.J.S.

Five A.J.S. machines were entered as under, and each was successful in obtaining 100% marks, thus obtaining gold medals:

W. Stevens (6 h.p. A.J.S. sc.), gold medal.
F. W. Giles (6 h.p. A.J.S. sc.), gold medal.
W. Choldercroft (4 h.p. A.J.S. solo), gold medal.
W. Jameson (6 h.p. A.J.S. sc.), gold medal.
J. Stevens (6 h.p. A.J.S. sc.), gold medal.

PREMIER AWARDS.

VICTORY CUP.

Presented by Lord Calthorpe for the best performance by any machine.

G. KUHN, 2½ h.p. Levis two-stroke.
62×70 mm. 217 c.c. Enfield two-speed gear.
Amac carburettor.

DUKE CUP.

Presented by R. W. Duke, Esq., for the next best performance.

G. A. DALBY, 4 h.p. Triumph sidecar.
95×97 mm. 550 c.c., S.A. gear box.

EVANS CUP.

Presented by P. J. Evans, Esq., for the best performance by member or ex-member of H.M. Forces.

G. KUHN, 2½ h.p. Levis two-stroke.

Ariel.

The Ariel has a 499 c.c. engine, and, as we have frequently pointed out for such hills as Sunrising, a machine with this size of engine is slightly under-powered. However, one of the sidecars made a very good show. Oerton failed on Sunrising and retired. Newey stopped on Rising Sun only.

F. J. Watson (3½ h.p. Ariel), gold medal.
L. Newey (3½ h.p. Ariel sc.), silver medal.
Chas. Oerton (3½ h.p. Ariel sc.), retired.

Allon.

Only one Allon two-stroke entered. This was ridden by J. W. Milner, who retired with engine trouble, which was unfortunate.

J. W. Milner (2¾ h.p. Allon), retired.

Blackburne.

The single 4 h.p. Blackburne entered secured a gold medal with 100% marks.
J. A. Watson-Bourne (4 h.p. Blackburne), gold medal.

B.S.A.

No fewer than eight B.S.A.'s started.

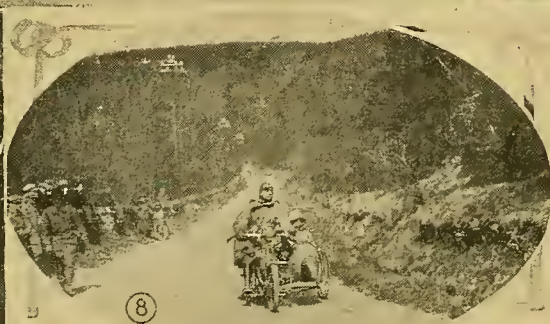
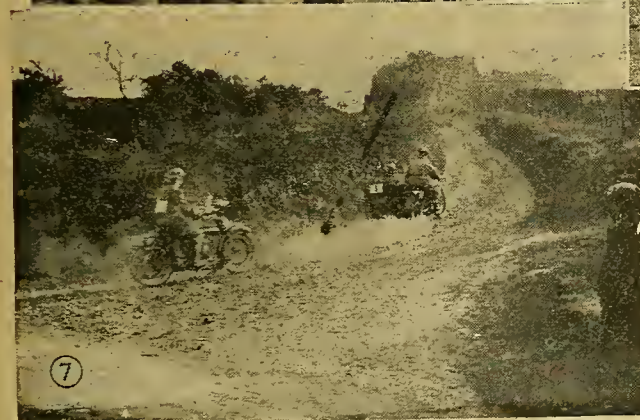
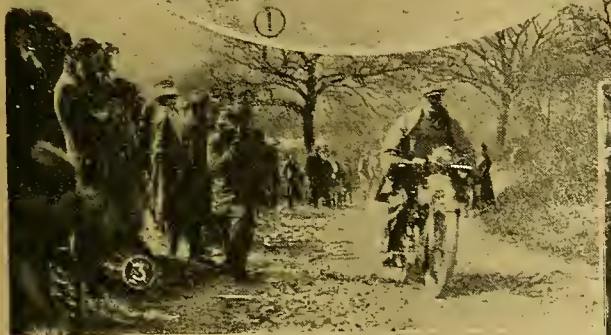
Nicholls failed on Rising Sun, W. R. Steel on the Wyche, Farr and Hill lost marks through being late at control. However, to obtain eight awards out of eight entrants is a very good performance.

C. Percival (4¼ h.p. B.S.A.), gold medal.
L. L. Sealey (4¼ h.p. B.S.A.), gold medal.
L. Baker (4¼ h.p. B.S.A. sc.), gold medal.
H. R. Lane (4¼ h.p. B.S.A.), gold medal.
R. H. Nicholls (4¼ h.p. B.S.A. solo), silver medal.
W. R. Steel (4¼ h.p. B.S.A. sc.), silver medal.
A. H. Farr (4¼ h.p. B.S.A.), silver medal.
A. E. Hill (4¼ h.p. B.S.A.), silver medal.

Chater-Jap.

H. Boynton (8 h.p. Chater-Jap), retired.

SCENES AT THE VICTORY CUP TRIAL.



(1) P. W. Moffatt on the new $3\frac{1}{2}$ h.p. spring-frame Douglas ascending Portway. (2) D. R. O'Donovan (Norton sidecar) climbing the Old Wyche. (3) H. R. Lane ($4\frac{1}{4}$ h.p. B.S.A.) on the lower part of Rising Sun. (4) J. Stevens ($4\frac{1}{4}$ h.p. James sidecar) on the Old Wyche. (5) The crowd of spectators on the Old Wyche, illustrating the new interest of the general public in motor cycles. (6) H. B. Dealey (Morgan) on Rising Sun. (7) L. L. Sealey (B.S.A.) and W. J. Hassell (4 h.p. Norton sidecar) at the bottom of Beacon Hill. (8) A Sunbeam on Birdlip.

The Victory Cup Trial Analysed.—

Connaught.

Only one Connaught was entered, and this usually good performer in trials of this nature stopped on the Old Wyche, Portway, and Rising Sun.

L. H. Boughton (2½ h.p. Connaught), no award.

Douglas.

There were four Douglas machines entered, three of which were ridden by well-known competition riders, the fourth being C. Pearson on a 4 h.p. model with sidecar, with which he failed to negotiate the test hills, and consequently received no award. The other three riders, however, did well.

P. W. Moffatt (1919 3¼ h.p. Douglas), gold medal.
N. B. Gibb (2¾ h.p. Douglas), gold medal.
C. Kickham (4 h.p. Douglas sc.), silver medal.
C. Pearson (4 h.p. Douglas sc.), no award.

Kickham stopped on Rising Sun only.

Diamond.

The two Diamond lightweights entered secured gold medals.

A. Milner (2½ h.p. Diamond), gold medal.
H. Minton (2½ h.p. Diamond), gold medal.

Enfield.

One 3 h.p. Enfield was entered, and secured a gold medal.

B. L. Bird (3 h.p. Enfield), gold medal.

Harley-Davidson.

Three of these big twin sidecars were entered, and put up a good performance, winning two gold and one silver medal. Masters attempted to climb Rising Sun on second gear and stopped on changing.

H. Notbeck (7 h.p. Harley sc.), gold medal.
W. A. Fell-Smith (7 h.p. Harley sc.), gold medal.
J. A. Masters (7 h.p. Harley sc.), silver medal.

Humber.

One 3½ h.p. flat twin represented the Humber, and, piloted by Sam Wright, secured a gold medal.

S. Wright (3½ h.p. Humber), gold medal.

Ivy.

S. Smith (2¼ h.p. Ivy), retired.
H. Smytheman (2½ h.p. Ivy), no award.

Indian.

The two Indians did well, the machine driven by Bridgman being the new 1919 model.

E. A. Bridgman (7 h.p. Indian sc.), gold medal.
E. D. Oliver (7 h.p. Indian sc.), gold medal.

James.

Eight James machines of several types were entered, but did not have the best

of luck. H. H. Saddington, on a 5-6 h.p. with sidecar, turned over at one of the corners, and afterwards retired; and Pollock on a 3½ h.p. twin stopped on the Old Wyche. However, with six medals to their credit, the James performance, on the whole, was very good. Eric Williams, the winner of the last Junior T.T., won a "gold."

S. Stevens (4¼ h.p. James sc.), gold medal.
J. Allday (3½ h.p. James twin), gold medal.
Eric Williams (3½ h.p. James twin), gold medal.
S. E. Muchlow (4¼ h.p. James sc.), gold medal.
J. F. Edstone (5-6 h.p. James), gold medal.
R. E. Wintle (4¼ h.p. James), silver medal.
T. Pollock (3½ h.p. James twin), no award.
H. H. Saddington (5-6 h.p. James sc.), retired.

Levis.

With two entries, the Levis secured the Victory Cup, the Evans Cup, and a gold medal.

Gus Kuhn (2¼ h.p. Levis), Victory and Evans Cups.

P. Pike (2¼ h.p. Levis), gold medal.

Morgan.

H. B. Dealey on a Morgan secured a silver medal. A chain came off the sprocket on Rising Sun.

H. B. Dealey (8 h.p. Morgan), silver medal.

Matchless.

Only one Matchless was in the trial, and this was piloted by Rex Mundy, who had the misfortune to break his throttle wire.

Rex Mundy (8 h.p. Matchless), no award.

New Imperial.

Two of these well-known lightweights were entered, and one did exceptionally well, securing a gold medal with 100% marks. The other entrant, however, made a performance the reverse of good, which, since the machines were identical, shows the influence of the human factor.

B. Kershaw (2¼ h.p. New Imperial), gold medal.
P. S. Taylor (2½ h.p. New Imperial), no award.

New Comet.

A. H. Haden, jun. (8 h.p. New Comet), no award.

Norton.

It was certainly not one of the Norton's luckiest days, and with nine entrants only four gold medals were obtained. W. J. Hassell retired with gear trouble, O'Donovan turned over on Birdlip, and Cutler had tyre troubles which forced him to retire.

H. A. Pattman (4 h.p. Norton sc.), gold medal.
H. Hassell (4 h.p. Norton), gold medal.
L. Southwell (4 h.p. Norton), gold medal.
H. Petty (3½ h.p. Norton), gold medal.
— Mansell (4 h.p. Norton sc.), retired.
D. A. S. Cleese (4 h.p. Norton), retired.
H. P. Cutler (4 h.p. Norton sc.), retired.
W. J. Hassell (4 h.p. Norton sc.), retired.
D. R. O'Donovan (4 h.p. Norton sc.), retired.

Rover.

The only Rover entered was a 5-6 h.p. twin, ridden solo, and as the rider went off the course he obtained no award.

J. F. Gardner (5-6 h.p. Rover), no award.

Radco.

G. A. Lovegrove (2½ h.p. Radco), no award.

Sun-Villiers.

— Gilmour (2½ h.p. Sun-Villiers), gold medal.

Sunbeam.

The six Sunbeams entered each secured an award, five of them winning gold medals. De la Hay stopped on Rising Sun.

J. Drew (3½ h.p. Sunbeam sc.), gold medal.
J. E. Greenwood (8 h.p. Sunbeam sc.), gold medal.
W. Frankham (3½ h.p. Sunbeam sc.), gold medal.
J. Dudley (3½ h.p. Sunbeam sc.), gold medal.
G. Dance (3½ h.p. Sunbeam), gold medal.
L. C. de la Hay (3½ h.p. Sunbeam), silver medal.

Triumph.

Three Triumphs were entered by private owners, one of whom, with sidecar, won the Duke cup, another a gold medal, and the third—Stretton Ward—unfortunately fell on the rough surface at the foot of Beacon, and so lost his award.

G. A. Dalby (4 h.p. Triumph sc.), Duke Cup.
E. Kibble (4 h.p. Triumph), gold medal.
H. J. Stretton Ward (4 h.p. Triumph), no award.

Zenith.

One Zenith only was entered, and this secured a silver medal.

R. Charlesworth (5 h.p. Zenith sc.), silver medal.

OBSERVATIONS ON THE TEST HILLS.

Beacon Hill.

The majority of riders climbed Beacon Hill steadily, but a few opened the throttle and went up with a dash. W. J. Hassell (4 h.p. Norton sc.) charged up, the sidecar wheel leaving the ground several times on the uneven surface. The Levis lightweights were fast, as was also Kickham (4 h.p. Douglas sc.). Gibb (2¾ h.p. Douglas) made a very steady but high speed climb.

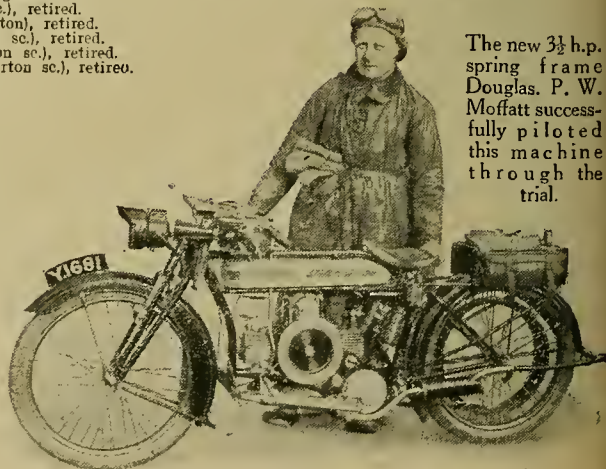
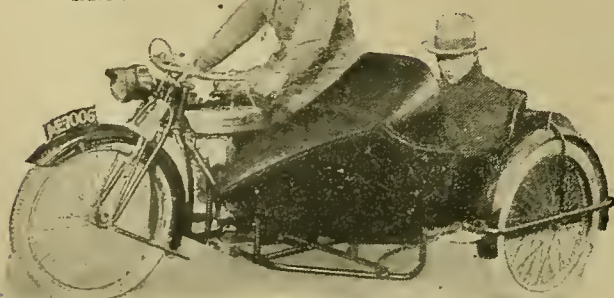
Only a few failures were recorded on this hill.

The Old Wyche (1 in 2.9).

Hundreds of spectators gathered on the Old Wyche, and no doubt had a capacious grandstand been erected it would have been filled. Unfortunately many non-competitors elected to try the hill during the competition, with the

The new 3½ h.p. spring frame Douglas. P. W. Moffatt successfully piloted this machine through the trial.

E. Kickham, 4 h.p. Douglas, and Dinky sidecar.



The Victory Cup Trial Analysed.—

result that both Boynton (Chater-Jap) and A. H. Haden (New Comet) were baulked. Gilmour, an Australian who entered at the last minute on a Sun Villiers, failed to make a clean ascent, his only failure, and Rex Mundy (Matchless) gave a display of clever driving at the top corner when he was obliged to slow down to a crawl to avoid Newey (3½ h.p. Ariel sc.).

Portway (1 in 5).

Nine competitors failed on Portway, upon which performances were consistently good. Saddington (5.6 h.p. James sc.) turned over, otherwise there was little incident to report.

Birdlip (1 in 5).

As this hill was in very good condition, it was the scene of many exceptionally fast climbs. Most of the solo singles ascended the hill fast without recourse to their low gears. Charlesworth (5 h.p. Zenith sc.) made a very fast climb. Gardner's twin Rover, J. A. Masters (8 h.p. Harley-Davidson sc.), and Gibb (2½ h.p. Douglas), too, were very fast. Giles (6 A.J.S. sc.) did not change down until he reached the last thirty yards.

Rising Sun (1 in 4½).

Gambles Lane (Rising Sun) was once more the "tit-bit" of the trial. The surface was very loose, and to control a machine on it required skill more than the average rider possesses. The majority of riders took the hill too fast, with the result that on the top stretch the machines became difficult to manage. The big concourse of spectators who lined the hill left but a narrow defile for the competitors, which, as usual, added to their difficulties.

What impressed us most was the manner in which the majority of single-cylinder sidecars ascended this hill. Instead of the all-out rush in bottom gear with which we were familiar before the war, these machines went up steadily, picking their way, and revealing a greater reserve of power than one would expect with engines in the neighbourhood of 500 c.c.

Fell Smith (Harley-Davidson sc.) made a sensational climb, passing another competitor in the narrow lane. Again, both Levis machines made good climbs. Masters (Harley-Davidson sc.) nearly reached the top before changing gear, and then stopped, but made an excellent restart. De la Hay (Sunbeam) fell, and Steel (B.S.A. sc.) got mixed up with the spectators, but made a clean ascent. Wintle (James) stopped, but made an excellent restart on the steepest part of the hill. Mundy (Matchless), with his throttle wire wrapped round a lead pencil in his hand, made a very fast climb.

Summary of Results.

	Gold medal	Silver medal	No award	Retired
Starters.	14	8	0	5
Lightweights	14	8	0	5
Solo singles	17	9	5	1
Sidecar singles	15	8	2	0
Solo twins	12	9	0	2
Sidecar twins	14	7	3	1
	72	41*	10	11
Morgan	1	0	1	0
	73	41	11	10

*Including cup winners.

From the above it will be seen that the solo singles made the best average performance, 82% securing awards. Twin sidecars came next with over 78%, followed by twin solos 75%, and single sidecars over 66%. Only 57% of the lightweights secured awards. In the matter of gold medals the solo twins carried off the palm with 9 medals out of a possible 12.

Retirements.

The retirements were highest among the sidecar singles, 33% of the starters retiring. The lightweights came next with 28%. The solo singles, solo twins, and sidecar twins have one retirement each, which represents 6%, 8% and 7% respectively.

BY THE WAY.

Several "Hush" models were in the trial, including the 1919 model 3½ h.p. spring frame Douglas, a 2½ h.p. spring frame New Imperial, and a Sunbeam with laminated springs fore and aft.

Rex Mundy (Victory Matchless) drove the major portion of the trial with a broken throttle wire in his hand. Notwithstanding, he made one of the best climbs on Rising Sun.

F. G. Edmond was seen on the Wyche, as a non-competitor, toying with the hill on a 1920 chain-driven Triumph sidecar.

Many non-competitors showed lack of sportsmanship by insisting upon trying Rising Sun in between the competitors. The egotism required to do this before such a crowd of spectators was pitiful to behold. We did not sympathise, however, with those who failed.

The new Douglas ridden by Moffatt had no exhaust noise under normal conditions. The running of the machine reminds one of a sewing machine.

There were 5,000 teachers in Cheltenham attending a convention. Result, no lunch.

One of the Norton sidecars carried an extra passenger on the pillion.

Several competitors were baulked by non-competitors.

Albert Milner, still in khaki, mounted on a Diamond, caused some amusement on the Old Wyche by raising his front wheel off the ground at the top of the hill.

Gibb's 2½ h.p. Douglas had a very pleasing exhaust note, and climbed exceptionally well.

W. H. Egginton, the Birmingham M.C.C. secretary, was riding a 6 h.p. Sunbeam as an official, with his crutches in the sidecar. He is slowly recovering from a bad accident sustained some time ago.

"Dignity and Impudence" was the title given to a big Harley-Davidson with a Canoelet racing sidecar having an enormous head light.

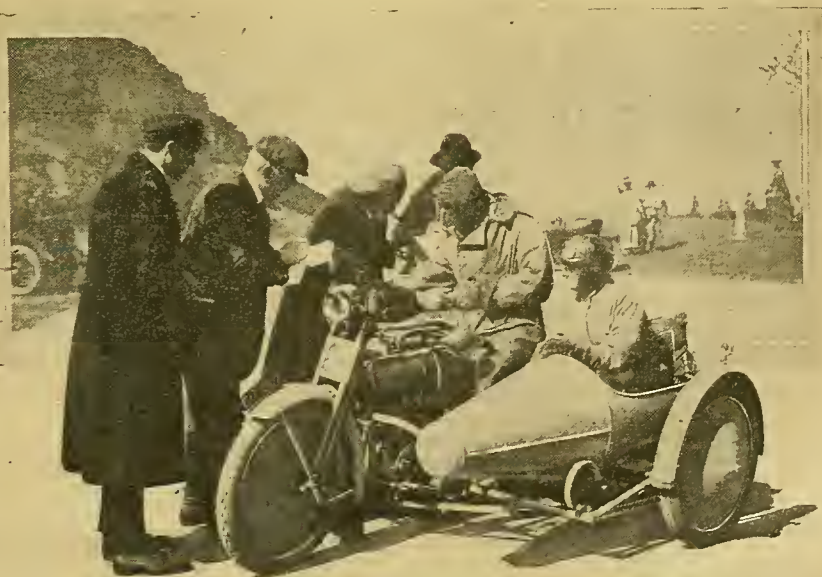
Bridgman's 1919 Indian sidecar gave a good impression.

Several of Kickham's "Dinky" sidecars were fitted to competing machines, and were voted to be the roomiest sporting sidecars ever seen.

J. Dudley (3½ Sunbeam) received quite an ovation for his ascent of the Wyche.

Pike's Levis, with which he won a gold medal, had the smallest engine in the trial, the capacity being 198 c.c., and did the entire course—126 miles—on less than a gallon of petrol.

A B.S.A. rider was mistaken for "Pa" Applebee.



In the time check at British Camp, near Malvern. Messrs. Lycett and J. T. Urry are seen busy examining the rider's sealed watch.



Sheffield and Hallamshire M.C.C.

A speed-judging competition has been arranged for the 10th inst., and the competition for the Dickenson and Darwen Cup will be held on the 24th.

Sutton Coldfield and Mid-Warwickshire A.C.

Mr. W. Hughes Butterfield is organising the half-day reliability trial on the 17th inst., and the route is a secret one, and will include at least two newly discovered hills.

A Colchester Club.

It is suggested that there is room for a motor cycle club in Colchester. Local motor cyclists should get together and organise a club.

The Junior Car Club.

On the 4th inst. the Junior Car Club will hold a run to Arms Hill, Henley; several members expect to make an attempt to climb the well-known gradient. Members are to meet at the foot of the hill at 2.45 p.m. To avoid the Uxbridge Road, which is in very bad condition, those travelling from London should proceed via Brentford, Hounslow, Colnbrook, and Slough.

N.M.C.F.U. (Wolverhampton).

The Wolverhampton Branch of the N.M.C.F.U. has been reorganised. A new committee has been elected, which is doing its best to place the branch upon a real business footing. The secretary's name is Mr. G. H. Sanders, and interested motor cyclists should communicate with him at 199, Dunstall Road, Wolverhampton.

Streatham and District M.C.C.

This well-known club is holding an opening run, on Saturday next, to the club's country headquarters, the Clayton Arms, Godstone, when, it is hoped, there will be a general reunion of old members. Prospective members and other visitors are also invited. The run is in the afternoon, so it is anticipated that the attendance will be a large one. The club is endeavouring to organise a late autumn open reliability trial.

Purley and District M.C.C.

We have had a letter from the hon. sec. of the Purley and District M.C.C., L.-Cpl. S. J. Taylor, 201,653, 2/5th Durham Light Infantry, Salonika Army. He states that he will be glad if any demobilised members of the old club (moribund since 1915) will communicate with him with a view to restarting it. Unfortunately, Mr. Taylor sees no prospect of returning home till 1920, so he trusts that any old members will set to work to revive the club, appoint a new hon. secretary, and proceed with a new programme. His father, Mr. E. Taylor, 19, Clifton Road, Wallington, Surrey, will hand over the necessary books and club papers.

Future Events.

May 3.—Birmingham M.C.C. Social Run to Warwick.

May 3.—Streatham and District M.C.C. Reunion at the Clayton Arms, Godstone.

May 3.—York and District M.C. Social Run.

May 4.—Bolton and District M.C. Reliability Trial.

May 4.—Harrogate and District M.C.C. Social Run and Picnic, Bylands Abbey.

May 4.—Ilkeston and District M.C.C. Run to Buzton.

May 4.—Liverpool M.C. Social Run to Llandudno.

May 4.—N.M.C.F.U., Sheffield. Reliability Run to Knutsford.

May 4.—Wolverhampton M.C.C. Social Run to Farlow Bank.

May 4.—Junior Car Club. Run to Arms Hill, Henley.

May 4.—Eastern Counties M.C. Competition, Audley End.

May 7.—York and District M.C. Slow Hill-climb, Garrowby.

May 10.—Exeter and District M.C.C. Opening Run.

May 10.—The M.C.C. Speed-judging Competition.

May 10.—Sheffield and Hallamshire M.C.C. Speed-judging Competition, Mam Tor.

May 10.—Wolverhampton M.C.C. Reliability Trial.

May 11.—Eastern Counties M.C. Run to Southend.

May 11.—Ilkeston and District M.C.C. Run to Ollerton.

May 11.—N.M.C.F.U., Sheffield. Run to Dovedale.

May 17-18.—Birmingham M.C.C. Week-end Touring Competition to Llangollen.

May 17.—Liverpool M.C. Social Run to Llangollen.

May 17.—Sutton Coldfield A.C. Half-day Trial.

May 17.—Woolwich, Plumstead, and District M.C.C. Open Trial for Matchless Cup.

May 21.—York and District M.C. Reliability Trial.

May 24.—Sheffield and Hallamshire M.C.C. Competition for Dickenson and Darwen Cup.

June 6.—M.C.C. London-Edinburgh Run.

June 7-9.—Birmingham M.C.C. Trial to Land's End.

August.—A.C.U. Six Days Reliability Trials.

Birmingham M.C.C.

Gus Kuhn (2½ Levis), the winner of the Victory and Evans Cups in the Victory Cup Trial, obtained 100 marks, and in the speed-judging competition was 16s. out. G. A. Dalby (4 Triumph sc.), winner of Duke Cup and gold medal, 100 marks, 24½s. error in speed-judging. The smallest error was Boughton (Connaught), ½s.; the greatest error Nottbeck, 1,123s.

N.M.C.F.U. (Sheffield).

Entries for the reliability run to Knutsford on the 4th (entrance fee 1s.) may be received up to to-morrow. Mr. L. B. Henderson will present a gold medal to the winner, and three other prizes are offered if sufficient entries are received. Those interested should communicate with the hon. secretary, Mr. W. Wright, 48, Hinde Street, Firth Park, Sheffield.

Essex M.C.

The results of the recent speed and distance judging competitions are now announced as under:

SPEED JUDGING COMPETITION.

E. Varney (Triumph) ...	51 secs.	Error.
—, Wellington (Triumph) ...	3 mins.	

DISTANCE JUDGING COMPETITION.

C. Pearson (Douglas) ...	1,100 yds.	Error.
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Blackheath and District M.C.

A meeting will be held at the White Hart Hotel, Bromley, Kent, on Saturday, the 10th inst., at 8 p.m., to discuss the reformation of this club. All motorists and motor cyclists interested are invited to be present. The honorary secretary is Mr. J. S. Wilson, Burnham Lodge, Lake Avenue, Bromley, Kent, who will be glad to forward information to prospective members.

Farnham and District M.C.C.

At a general meeting held at the Bush Hotel, Farnham, the above club was formed with a membership of thirty. The subscription was fixed at 7s. 6d. per annum. It is the intention of the committee to hold a large number of social runs, as well as competitions. Interested local motor cyclists should communicate with the joint hon. secs., Messrs. A. F. Bateman and L. J. Mitchell, "The Lindens," Farnham, Surrey.

Ilkeston and District M.C.C.

The runs of the newly-formed Ilkeston and District M.C.C. have been very successful up to the present, and well attended by its members. The run to Skegness was a very pleasant outing.

The club is enrolling many new members, and a very strong membership is anticipated. Motor cyclists in the district who would like to enjoy the benefits of club runs should make application to become members to Mr. A. Checkland, 106, Bath Street, Ilkeston.

Wolverhampton M.C.C.

This club is now in full swing with Mr. A. O. Haskins, 15, King Street, Wolverhampton, as secretary. A reliability trial is being organised for the 10th inst., and arrangements are in hand for an open hill-climb.

Over 500 Motor Cycles at N.M.C.F.U. Rally.

The Gathering of National Motor Cyclist Fuel Union Members at Stratford-on-Avon produces a Record Number of Participants.

ABOUT 550 members of the N.M.C.F.U. congregated at Stratford-on-Avon for the intermeet organised by the Birmingham and Coventry branch secretaries, and these were mounted on almost every conceivable type of machine, both ancient and modern.

Almost everywhere the owners' keen interest in their machines was in evidence, and as many of the members are mechanics it was not surprising to find that, in many cases, the makers' design had been "improved" in detail.

For example, one of the most attractive outfits we saw was a Harley-Davidson, upon which the owner, a Mr. Bateman, of Coventry, had lavished much thought, time, and money. The mudguards were of his own make, and followed A.J.S. lines to some extent. Each was made in one piece of heavy gauge material. The guards were certainly the best we have seen. Other improvements included a hot air muff on the induction pipe, a special type of extra air valve, a thief-baffling device, and a three-sided sidecar screen. The machine was very complete as to electric lamps, and the sidecar was ornamented with a mascot.

Another machine which created a great deal of interest was a $3\frac{1}{2}$ h.p. solo Sunbeam finished all black, with disc wheels, electric light, and chain-cum-belt drive, while near by stood a Premier "flying bedstead," one of the machines with $3\frac{1}{2}$ h.p. single-cylinder engine and outside flywheel, etc., built for the 1914 T.T. The owner had reduced the compression ratio and fitted chain cases.

Picnic Equipment.

Almost every sidecar carried one or more small children, and picnic baskets seemed to be part of the standard equipment in most cases.

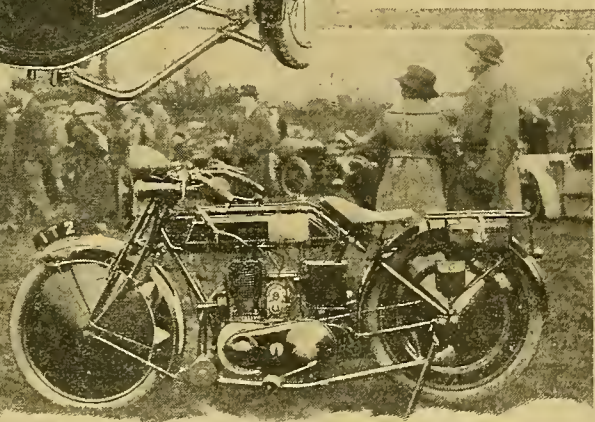
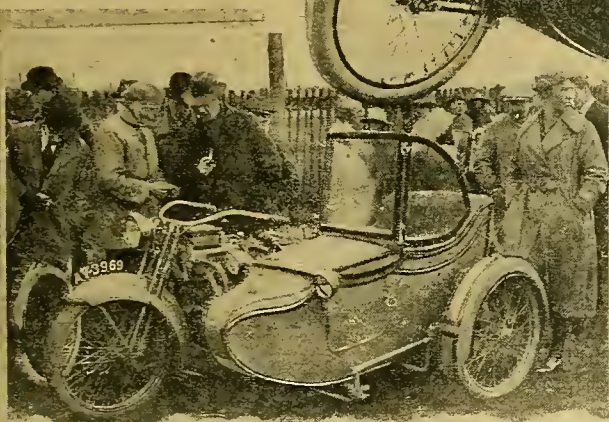
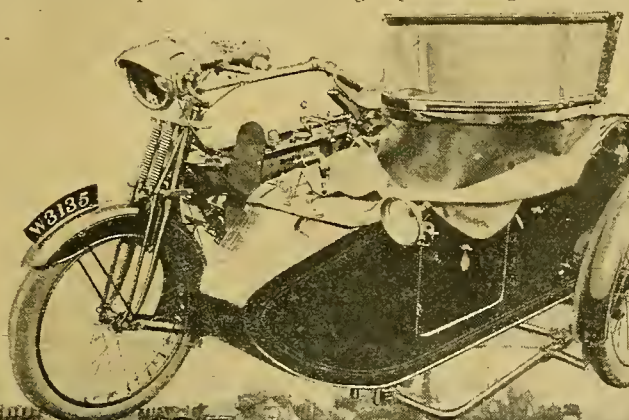
The organisers had made arrangements to park the machines in groups according

to the centres from which they had come. We noticed groups of various numbers from Sheffield, Leicester, Derby, Birmingham, and Coventry. Naturally, the Birmingham and Coventry centres were well represented.

New Models.

The display of 1919 models was somewhat disappointing. The new Rex, a 6 h.p. Rover, an A.J.S., and the Coventry Victor were noticed. The last mentioned is a flat twin of unusual design, with the gear box mounted high up in the frame.

During the day there were speeches by officials, including Mr. A. W. Torkington, the president of the Union, and a cinema operator was very busy during the run out for the circular tour of ten miles. Later there was a demonstration by Coventry testers in fancy costume, which, however, we think, was not quite appropriate for a Sunday event. On the whole, the organisers, Messrs. Murray and Malilieu, are to be congratulated upon a very successful rally of members of the N.M.C.F.U.



(Top) A smart Enfield sidecar outfit seen at the N.M.C.F.U. rally. A small mascot of Cupid will be seen on the sidecar.
(Left) A well-equipped Harley-Davidson attracted much attention. The design of the windscreen is worthy of note.
(Right) An all black $3\frac{1}{2}$ h.p. Sunbeam, with disc wheels, the appearance of which was particularly admired.

MOTOR CYCLING AT CHRISTCHURCH, NEW ZEALAND.

ON February 15th the Pioneer Sports Club, Christchurch, New Zealand, held its annual carnival, which proved very successful. Results:

LIGHTWEIGHT HANDICAP (EIGHT MILES).—
Machines up to 600 c.c.

1. F. Haworth ($2\frac{1}{2}$ Triumph) ... 70s.
 2. G. Moffatt ($4\frac{1}{2}$ B.S.A.) ... 30s.
- Time, 9m. 17 $\frac{1}{2}$ s. 51.6m.p.h. Seven started.

SOUTH ISLAND MIDDLEWEIGHT CHAMPIONSHIP (TEN MILES).

1. F. Haworth ($2\frac{1}{2}$ Triumph).
 2. G. Moffatt ($4\frac{1}{2}$ B.S.A.).
- Time, 10m. 14 $\frac{1}{2}$ s. 58.5 m.p.h.

AUSTRALASIAN HEAVYWEIGHT CHAMPIONSHIP (FIFTEEN MILES).

1. H. R. Crawley (7 Harley-Davidson).
 2. L. Mangham (7 Harley-Davidson).
- Time, 14m. 12s. 63.4 m.p.h.

TOURIST HANDICAP (FIVE MILES).—Open to any power.

1. L. D. Bamfield ($2\frac{1}{2}$ Douglas) ... 210s.
 2. E. G. Barrell (7 Indian) ... 110s.
- Time, 8m. 26 $\frac{1}{2}$ s. 35.5 m.p.h.

OPEN HANDICAP (EIGHT MILES).

1. F. Haworth ($2\frac{1}{2}$ Triumph) ... 150s.
 2. N. Souter (7 Harley-Davidson) ... 80s.
- Time, 9m. 10 $\frac{1}{2}$ s. 52.3 m.p.h. Won easily.

SIDECAR HANDICAP (FIVE MILES).

1. H. Jones (7 Harley-Davidson) 25s.
 2. R. L. Kennett (7 Harley-Davidson) ... scr.
- Time, 6m. 23s. 47 m.p.h.

An interesting event was a race between R. Crawley (7 Harley-Davidson) and J. Mercer (100 h.p. biplane). The course was five miles, each competitor making a flying start. The airman flew round the course at a height of about 500 feet, but had some difficulty in keeping to the line of the track. Crawley was an easy winner by fifty yards. The time is not available.

THE RICHMOND MEET.

Revival of the Annual Yorkshire Intermeeting of Motor Cycle Clubs.



Members of the Middlesbrough Motor Cycle Club, one of the several clubs at the Richmond Meet.

TO mark the opening of the summer season in pre-war days the North of England clubs held an intermeet at Richmond, which was always well attended. This year's event, however, only attracted some seventy motor cyclists, which comparatively low number is accounted for in various ways. In the first place, a large number of club members have not yet taken delivery of their machines, and many others who were more fortunate took advantage of the holiday to go touring.

However, despite the presence of threatening clouds early in the day, which induced several to don "oilies" in preparation, members of the Middlesbrough, York, and Harrogate Clubs started for the venue, and by devious paths reached Richmond, which the first-comers found very quiet.

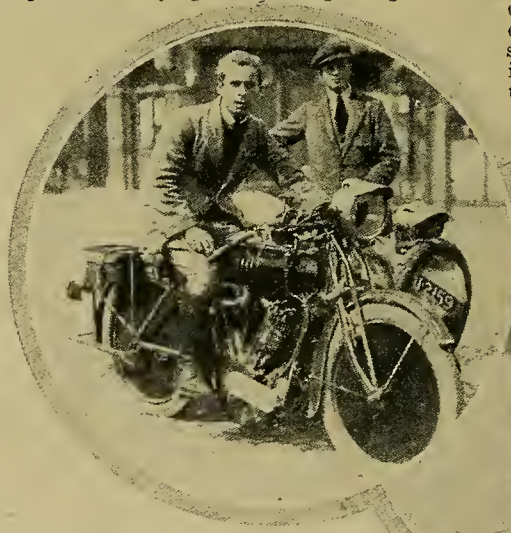
As at every motor cyclists' rendezvous, great interest was displayed in new machines, but except for a few new Triumphs, B.S.A.'s, and a P. and M., no post-war models were on view. The only light car in evidence was a smart Singer, which had 8,000 miles to its credit, and a few Morgans represented the cycle cars.

Only one lady driver was seen, and she was on an old twin Peugeot with sidecar, which was driven from Middlesbrough.

Mr. J. Stevenson arrived from Darlington with a 1913 6 h.p. Clyno outfit carrying no fewer than five passengers—a load which he says the machine is easily capable of carrying. An old lightweight

F.N. with a passenger on the carrier was noticed.

The event this year proved to be a very pleasant affair, but future Richmond rallies no doubt will be more like those of pre-war days, when the secretaries of Northern clubs met to discuss summer programmes, and to arrange inter-club runs, and motor cyclists turned up in their hundreds.



(Left) R. T. Cawthorne, a north-country rider, on a smart Dot outfit. (Right) J. Butler on his 3½ h.p. Scott sidecar.



DUBLIN RELIABILITY TRIAL.

THE Easter trial of the Dublin and District Motor Cycle Club attracted a very good entry, despite the fact that the great majority of those who took part in the event were mounted on machines that in pre-war days would have been regarded as being past service for such strenuous work as Irish trials usually prove. The certainty that this would be the case doubtless weighed with the committee in fixing the course, as Dublin to Dundalk, by Ashbourne,

Collon, and Slane, and back by Dunleer, Drogheda, and Balbriggan, would not have been regarded as a severe test in the early days of the pastime. The route of approximately one hundred miles ended at Drumcondra.

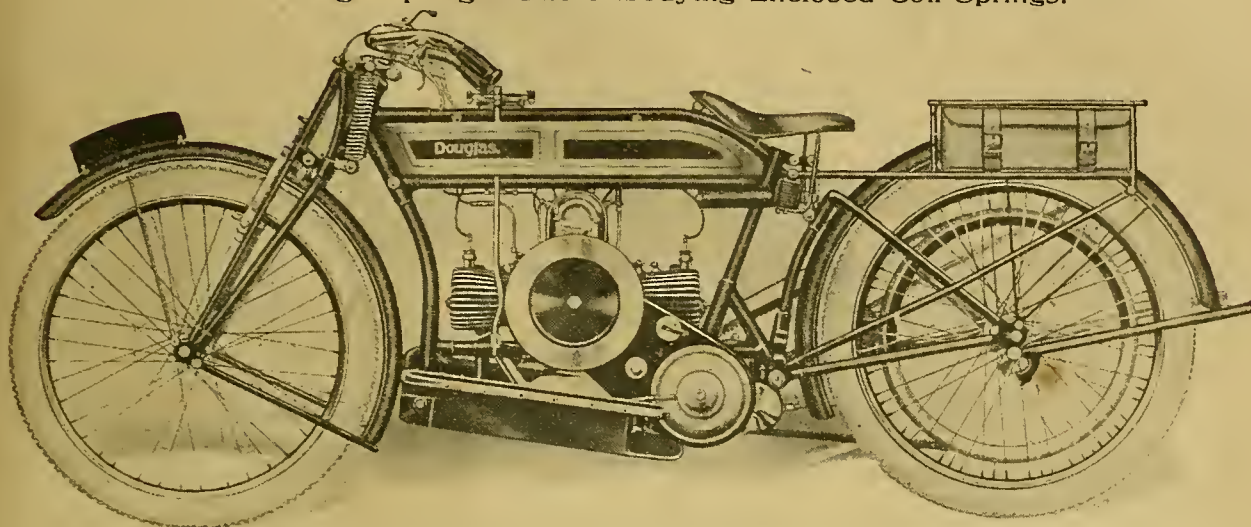
Of the 26 entries received, 19 started.

Despite the easy nature of the course, only two-thirds of the starters completed the journey. One secret check was taken, and the variation thereat decided the result of the competition.

The results were as follow: 1, A. Grimes (7 Indian sc.), 31s. variation; 2 and 3 tied, T. Redmond (7 Indian sc.) and J. Adair (2½ New Hudson), 34s.; 4, A. Carton (7 Indian sc.), 38s.; 5, R. Hewison (7 Excelsior sc.), 57s.; 6, D. Allen (2½ Allon), 64s.; 7, R. Clarke (7 Excelsior sc.), 69s.; 8, P. H. Hurse (4¼ B.S.A.), 84s.; 9, M. McLoughlan (3½ Norton), 88s.; 10, T. Carton (2¾ Douglas), 89s.; 11, R. Armstrong (6 Enfield sc.), 94s.; 12, F. McMullen (3½ Rndge), 144s.

A 3½ h.p. Spring Frame Douglas for 1919.

New Design Spring Frame embodying Enclosed Coil Springs.



The new 3½ h.p. Douglas, which is fitted with a spring frame. The flat twin engine has cylinders 68 × 68 mm. = 494 c.c.

WORLD-WIDE is the reputation enjoyed by Messrs. Douglas Motors, Ltd., of Bristol, the pioneers of the flat twin. A general engineering business, with a speciality in boot and shoe machinery, and an intelligent anticipation of the motor cycle needs of the public in taking up a small flat twin lightweight proved to be the foundation of the present important branch of the motor cycle industry. Then followed a remarkable run of success in competition on road and track, culminating in a still more notable success on war service on all fronts. Such in brief is a summary of the qualifications and experience behind this latest production, the 3½ h.p. Douglas.

1919 is in fact a complete redesign in every part. New as it is to the ordinary rider, the firm have subjected the model to extensive road tests during many months, and now offer the 3½ h.p. as a proved design, representing the result of their accumulated and unique experience.

The Engine Unit.

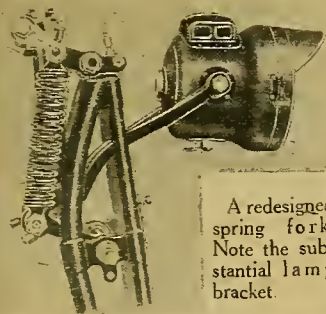
The volume swept by the pistons is a shade under 500 c.c., each cylinder being 68 × 68 mm., and it is to be nominated 3½ h.p., but, of course, develops more. The valves, inclined side by side on the right hand of the unit (differing from the 4 h.p. models, which are on top), are operated through links by single cam wheel, one cam lifting the exhaust valves and the other actuating the two

inlet valves. An intermediate wheel carries a worm driving, at right angles, a small rotary lubricating pump running at one-twentieth engine speed, situated on the side of the crank case near the top, thus admitting of very short oil pipes being used.

A hand pump and sight feed is interconnected with the rotary pump, and one lead only is given, that being to the front cylinder.

The magneto pinion wheel, independently mounted, drives the magneto by a single dog; removal is facilitated without disturbing the timing, and it is impossible to replace the magneto incorrectly.

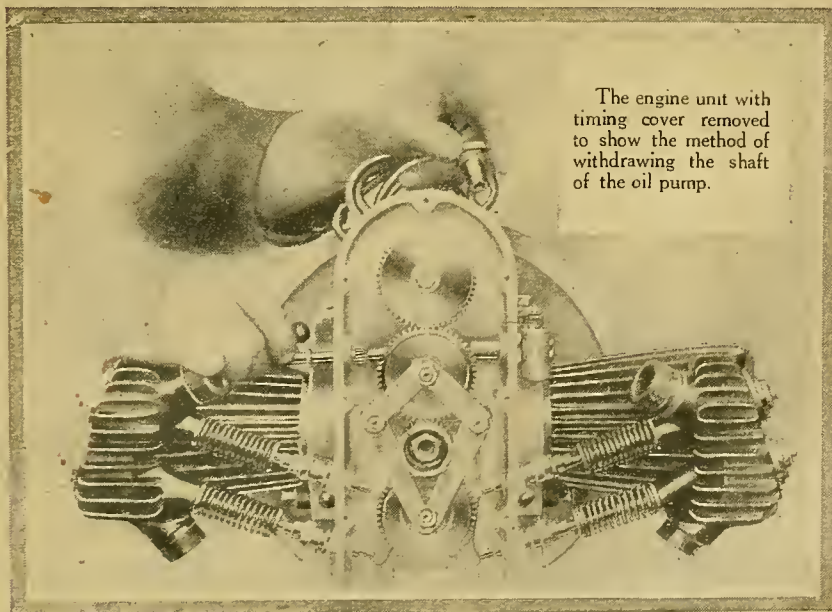
It is interesting to observe the position adopted for the plug, i.e., between the inlet valve and cylinder head.



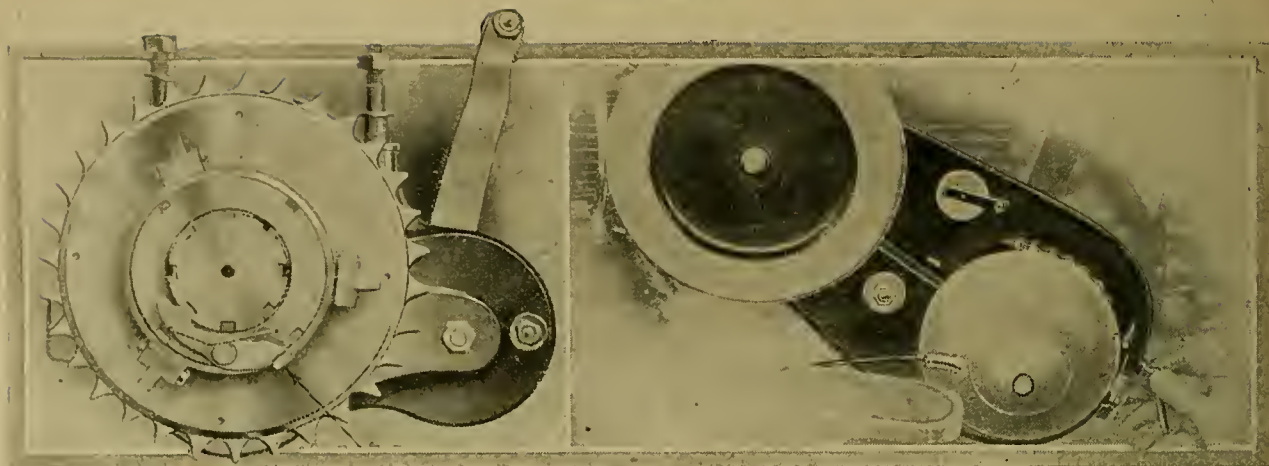
A redesigned spring fork
Note the substantial lamp bracket.

It is extraordinary how, in the early days, environment considerably affected the design of motor cycles. In this connection the firm claim that their factory, situated as it is in the hilly West, gives them a considerable advantage over many other manufacturers in the matter of testing. They argue that if a motor cycle will give efficient service in the West Country it may be relied upon to do so anywhere, and many who know the Bristol district well will agree.

Though retaining the general Douglas outlines, the 3½ h.p. model introduced for



The engine unit with timing cover removed to show the method of withdrawing the shaft of the oil pump.



(Left) Clutch operating mechanism. The arrow points to the adjusting ratchet lever. (Right) By removing two nuts the chain cover is detached; the centre portion of the domed clutch cover gives access to the operating mechanism.

The cylinders differ slightly from former models, the horizontal fins tapering towards the base, whilst unusually large cylinder ports are provided. The extent of the offset is not so pronounced as hitherto, a little wider offset at the small end of the connecting rods being necessitated thereby.

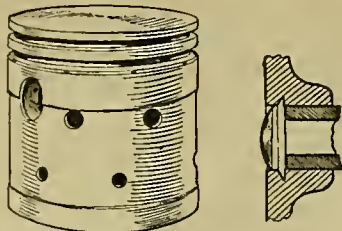
Douglas standard type pistons are employed with two top rings only. On the lower edge of the lower groove a bevel is formed, through which is drilled

small flanges to retain the rollers, a depression being provided on the rod to assist assembly; the addition of loose flanges is thus obviated. Balance weights are fitted and absolute tightness is ensured by wedging surfaces and one bolt in each web. The main bearings may be either ball or roller, provision being made for either type.

Concentric aluminium fins are fitted to

the valve caps to assist cooling, and very light, easily adjustable tappets are another good point.

An Amac carburettor of the type favoured by this firm, i.e., with exhaust jacketed vaporising chamber, is coupled up to external induction pipes; the incorporation of an induction chamber in the timing case was made the subject of experiment, but did not offer advantages to balance the increased cost of produc-



(Left) A standard type of piston. Note small drilled holes on the bevelled edge of the lower groove.

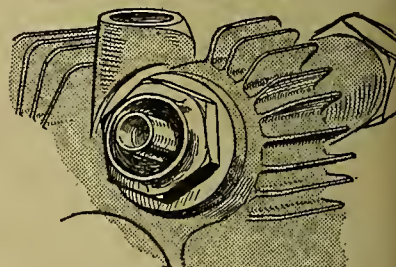
(Right) Gudgeon pin fixing. A domed copper cap is placed in the hole and expanded into the groove by pressure. The cap on one side has a central hole through which to insert a rod when removing the cap on the opposite side.

a number of small oil holes leading to the interior of the piston. The interior of the piston is webbed.

Main shaft and connecting rods form a very neat item; the roller bearing big ends are ingeniously constructed with



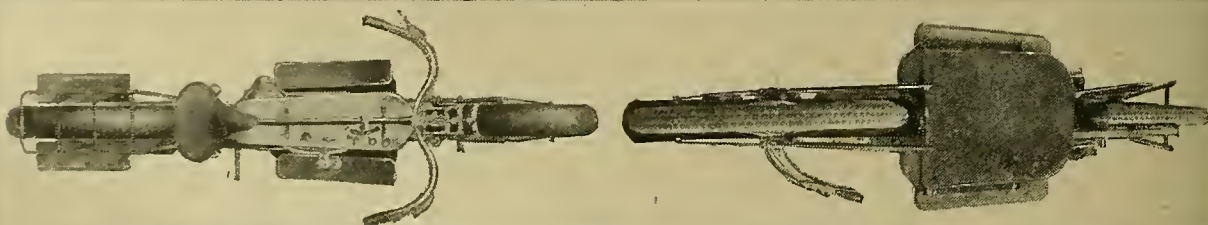
The magneto is removed by detaching two nuts on a bridge member which releases a horseshoe distance piece. The magneto can be lifted out without disturbing the timing.



The valve caps have two concentric aluminium fins to assist cooling

tion. Perhaps the most unique point of this newly designed engine is its mode of attachment at three points only, two lower frame bolts and one upper bolt connecting the magneto holding-down bridge to the centre of the under tank tube. The advantage lies in the fact that the whole engine unit can be taken out of the frame in less time than it takes to remove a cylinder from the average single-cylinder engine.

The method of securing the magneto is quite new. A horseshoe bridge with a distance piece binds it firmly on the



(Left) Plan view of the new Douglas (Right) Underneath view of the machine, showing ample size of the undershield.

A 3½ h.p. Spring Frame Douglas for 1919.—

top of the crank case, and also represents the third point of engine attachment just mentioned. Each of the three nuts is instantly accessible.

Provision is made for the installation of a Lucas lighting dynamo, the drive being taken from the magneto pinion; a new timing case cover and magneto bridge are necessary with an extension to cover the dynamo drive. This item forms an extra to the standard specification.

Combined chain and belt transmission is still used, not without due consideration of the claims of chain, belt, or shaft drive. A Renold $\frac{1}{2}$ in. \times $\frac{5}{16}$ in. pitch chain is employed between engine and countershaft, the enclosing chain case being oil tight, yet very easily detachable; whilst both chain and clutch run in an oil bath.

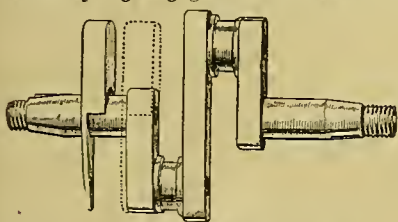
Countershaft Three-speed Gear.

The ratios adopted are: Top gear 5.1 to 1, middle 7.8 to 1, and low 11.9 to 1. The gear has been completely redesigned, but on the same principles as that



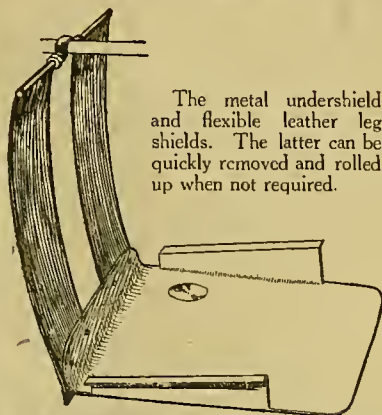
The connecting rod, showing small flanges for retaining the rollers of the big end bearings.

formerly fitted on Douglas models; the chief innovations are the clutch and enclosed kick starter. The clutch is of the cone type, cast iron to mild steel, running on a ball bearing. The chain wheel carries six cone taper surfaces, three on each side, engaging with corresponding surfaces on the inner and outer plates, whilst each face has oil conveying grooves formed upon it. A 50 lb. double central helical spring engages with three radial



Crankshaft, showing one loose balance weight. Its final position is indicated by the dotted line.

levers on a floating ring; these provide a 3 to 1 leverage, and the operating mechanism provides a 4 to 1 leverage, thus giving very easy control. No tools are necessary for adjustment, a ratchet lever, operated by hand, remaining *in situ* on the clutch. The domed cover and



The metal undershield and flexible leather leg shields. The latter can be quickly removed and rolled up when not required.

the gear box casting are in aluminium with dull smooth finish. The combined attachment for the clutch control lever and exhaust lifter to the handle-bar is particularly neat. The final drive is by a $\frac{1}{2}$ in. belt, which is protected by a metal shield.

The New Spring Frame.

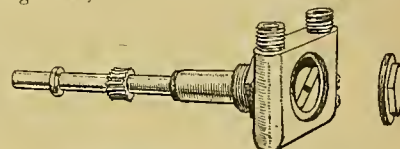
Steel lugs are employed, bored from the solid stampings, the head being a particularly strong point. The Douglas spring frame, which we have previously noted as a patent, is a complete departure from their former practice, laminated springs being abandoned in favour of helical springs. The rear frame is pivoted behind the gear box bracket on a very wide, hardened and ground plain bearing; the upper point is connected through an ingenious pair of levers, whose function is to reduce movement, to a pair of enclosed helical springs placed horizontally on each side of the saddle lug. These springs (each being made up of two concentric springs) act in compression, and adjustment is provided to suit different riders' weights. Approximately, $\frac{3}{4}$ in. movement of the wheel is reduced to about $\frac{1}{4}$ in. on the springs. The carrier is sprung with the frame. Means of lubri-

cating all moving parts are provided. For three years this spring frame has been under test by the Douglas firm, and so satisfactory is it in the comfort provided, hard wearing capabilities, and absence of lateral movement, that it takes a definite place in their future programme. Wheels and tyres are 26 in. \times 2½ in.

Mudguarding.

Special consideration has been given to mudguarding. There are deep valances on wide guards to both wheels, a substantial undershield with side valances fitting to the inner edge of the footboard, and, if required, flexible leg shields attached to a cross bar on the top tube. This cross bar is only dropped on, no fastening, the shields being buttoned down tightly to the front flange of the undershield.

The rear brake operates on the belt rim from a right pedal through a compensating lever, whilst the front brake is of the



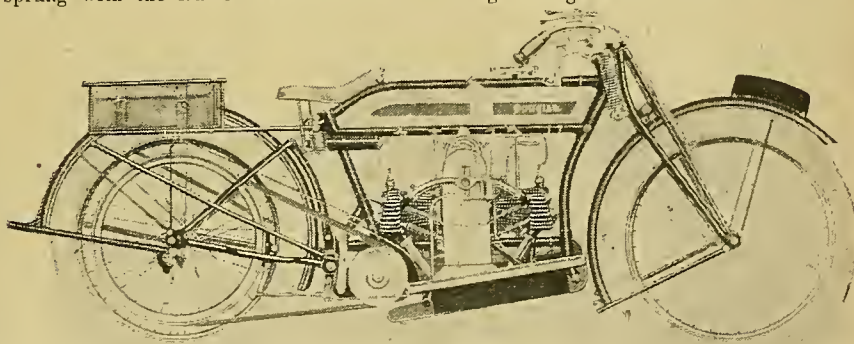
The rotary oil pump and driving shaft.

conventional stirrup type. The saddle is fixed to the frame, adjustment for riding position being at the footboards.

The new tank, a variation of the 4 h.p. type, has a petrol capacity of one gallon five pints, and of lubricating oil two and three-quarter pints. The gear control lever is in the usual Douglas position over the tank, and the vertical control rod passes through the tank.

As a solo mount with empty tank the machine scales 231 lb.

We hope shortly to avail ourselves of a proffered trial of one of these new 3½ h.p. machines, which, combined with a re-designed 2½ h.p. lightweight and the 4 h.p. sidecar model, will form the Douglas range in 1919.



Valve side of the 3½ h.p. Douglas. The weight of the machine is 231 lb., and petrol capacity 1 gall. 5 pints.

AUTO CYCLE UNION NOTES.

(Officially communicated.)

SECOND-HAND MOTOR CYCLES.—The Auto Cycle Union has been busily engaged recently in advising members in buying second-hand machines.

A MOTOR CYCLISTS' MEMORIAL.—A committee has been formed by the Auto Cycle Union to look into the matter of a permanent memorial to the services rendered by motor cyclists during the war.

A COMMEMORATION OF MOTOR CYCLISTS.—On the suggestion of the Rev. E. P. Greenhill, the Auto Cycle Union is to take steps to arrange a commemoration service to the memory of members who have fallen in the war.

FORTHCOMING A.C.U. MEETINGS.—The Auto Cycle Union has arranged the following dates and venues for forthcoming

meetings of the General Committee: June 20th, Bristol; September, headquarters of Six Days Trial; November 28th, London (during the motor cycle exhibition); February 20th, 1920, Manchester.

NEW MEMBERS.—Despite recent extension, the Auto Cycle Union is having to consider the advisability of still further enlarging the premises at headquarters.



Times to Light Lamps.

SUMMER TIME.

May 1st	...	...	8.50 p.m.
" 3rd	...	...	8.54 "
" 5th	...	...	8.57 "
" 7th	...	...	8.59 "

The Six Days Trial.

It is practically certain that the A.C.U. Six Days will be held in September.

Dutch Show.

There is to be a car and motor cycle exhibition in Amsterdam in July next.

Imports Restricted.

The Board of Trade announce that ball bearings, roller bearings, ball retainers, ball bearing bolts, and steel balls may be imported only under limited licences.

"The First 100,000."

This issue of *The Motor Cycle* sets up a new world's record in the circulation of motoring journals, the printing order exceeding 100,000 copies.

Lecture on Benzole.

The Liverpool Motor Club has arranged a lecture to be held at the small Picton Lecture Hall on the 5th inst. at 7.30 p.m. The lecturer will be Mr. S. Henshaw, of the Staffordshire Chemical Co., one of the best authorities on this subject. Mr. T. W. Loughborough, A.M.I.A.E., secretary of the A.C.U., has promised to be present.

Trade Control Abolished.

The Board of Trade announced last week that, with a few exceptions, all controls on the sale and distribution of commodities exercised by the War Office, Admiralty, Ministry of Munitions, and Board of Trade have been abolished, or will cease at the latest by May 31st. This opens the way to a great trade revival.

Results of Cork Trial.

First-class awards (marks lost given in parentheses): E. B. Russell, 4 Triumph (1), G. H. Ogilvie, 4 Triumph (2), T. R. Popham, 6 Enfield sc. (2), J. Gibbings, 4½ B.S.A. (3), J. P. Frost, 6 Enfield sc. (3), W. Waterman, 7 Indian (6), S. R. Hasford, 3½ Zenith (6). Second-class awards: J. Atkinson (5-6 Ariel), J. Ryan (2½ A.J.S.), J. A. Wilson (3½ Rover). Third-class awards: W. J. Musgrave (4 Triumph sc.). Special awards: Best performance, E. B. Russell; sidecar prize, T. R. Popham; novices' prize, T. R. Popham; sidecar prize under 600 c.c., W. J. Musgrave; beginners' prize, J. H. Watson.

The Institution of Automobile Engineers.

The eleventh meeting of the session of the Institution of Automobile Engineers will be held on Wednesday, the 7th inst., at the Royal Society of Arts, John Street, Adelphi, W.C., at 8 p.m., when Mr. Chas. Day will read a paper on "Diesel Engines." Cards of invitation to the meeting may be obtained by those interested in the subject on application to the Secretary of the Institution of Automobile Engineers, 28, Victoria Street, London, S.W.1. A further meeting will also be held at the Chamber of Commerce Hall, New Street, Birmingham, on Thursday, the 8th inst., at 7.30 p.m., when Mr. E. Tilston will read a paper entitled "Two-stroke Engines for Motor Cycles."

The Winner of the Victory Cup.

To Mr. Gus Kuhn, of S. Yardley, Birmingham, is due the honour of winning the premier award in the first British post-war open trial. His performance was a remarkably good one, especially as the mount upon which he won the Victory and Evans cups was a lightweight, to wit a 2½ h.p. Levis.

The particular Levis upon which he won the Victory cup is a comparatively old machine, being a well-worn 1914-1915 model with Enfield gear (ratios 5½ and 10½ to 1), Amac carburetter, and Hutchinson 26in. x 2in. tyres. Mr. Kuhn tells us that his average consumption is about 125 m.p.g., and that his maximum speed is about 40 m.p.h.

Special Features.

THE VICTORY CUP.

HILLS ON WHICH I HAVE FAILED.
NEW MODELS.

A.C.U. Committees.

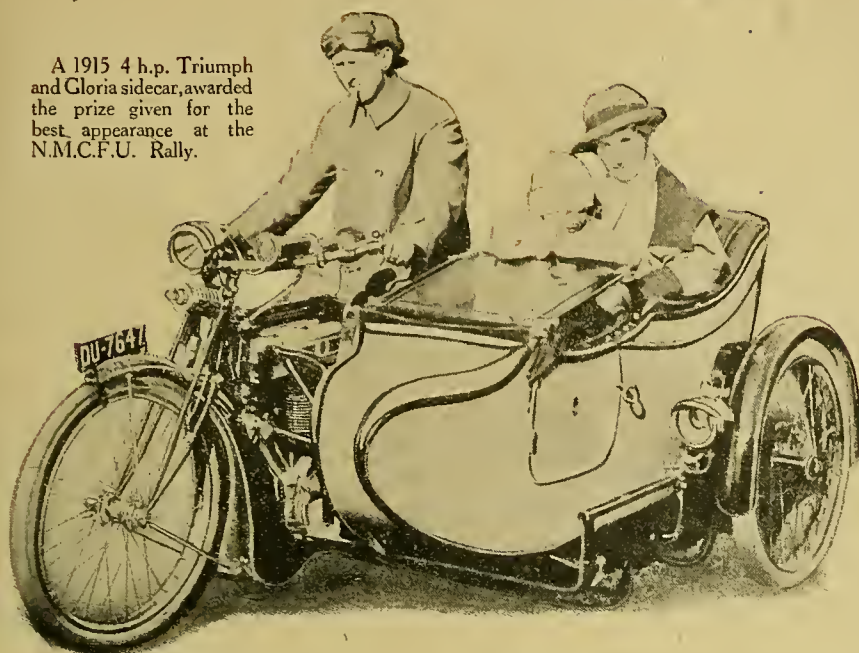
The following are elected to serve on the Competitions Sub-committee of the A.C.U.: Messrs. E. B. Ware, A. V. Ebbelwhite, F. A. Hardy, Alec Ross, J. W. G. Brooker, Maj. A. M. Low, R.A.F., the Rev. E. P. Greenhill, Col. A. E. Davidson, D.S.O., R.E., Maj. W. G. McMinnies, R.A.F., Col. D. F. Nicholl, D.S.O., R.A., Messrs. W. Cooper and A. G. Reynolds.

The Touring Sub-committee consists of Messrs. H. P. E. Harding, H. G. Bell, E. M. P. Boileau, J. W. G. Brooker, B. Mariani, Maj. W. G. McMinnies, Mr. W. H. Wells, Maj. J. R. Potter, Mr. L. Wozencroft, Maj. S. R. Axford, Messrs. F. Murray and S. L. Bailey.



Mr. Gus Kuhn (No. 25), the winner of the Victory and Evans cups in the Victory Cup Trial, mounted on the 2½ h.p. Levis, with which he secured the awards. The weight of the machine is sufficiently light to permit of its being lifted by its rider. Petrol consumption equals 125 m.p.g.

A 1915 4 h.p. Triumph and Gloria sidecar, awarded the prize given for the best appearance at the N.M.C.F.U. Rally.



On Birdlip.

A small dog persisted in trotting across Birdlip in front of almost every competitor during the Victory Cup Trial, and its owner did not seem to realise the number of times her pet narrowly escaped sudden death.

Demand for 1,500,000 Motor Cycles.

According to an American paper, Mr. Duncan Watson, M.I.E.E., the managing director of the British Harley-Davidson Co., is credited with having stated that the British post-war demand for motor cycles will not be satisfied until a million and a half motor cycles are produced.

French Motor Cycles.

An interesting article on the French view of the motor cycle position in France appeared in a recent issue of *L'Auto*. The article generously gives England the credit for being the leader in the world of motor cycle construction. It points out how, in years gone by, French manufacturers were afraid of launching forth into the motor cycle market, and contented themselves with delivering cheap machines, clearly inferior to those manufactured by their British neighbours. It was shown that the motor cycle, far from being a vehicle purely for sport and luxury, became of prior utility during the war and was employed on a large scale by the English, Americans, and French. At the present time several of the French aeroplane manufacturers are devoting their attention to and are using their factories for the production of motor cycles of first rank, machines which our contemporary says will be capable of combating foreign competition. Not much can be done at the moment, but a few months hence it is anticipated that the factories will be turning out machines of a quality even better than expected. It is reported that M. Georges Levi, a manufacturer of seaplanes, is about to devote his factory and technical departments at Levallois to the manufacture of high grade motor cycles.

Good Spare Parts.

A question in the House of Commons the other day elicited the fact that the Government has £15,000,000 worth of spare parts and accessories for all types of motor vehicles, half of which are in this country. Such as are surplus are to be sold.

New French Models.

THE 1919 GRIFFON.—The makers of the Griffon—The Société Anonyme des Cycles Griffon, 40, Rue Louis-Blanc, Courbevoie, Seine—are concentrating on a single model: 6 h.p. twin-cylinder, 74 mm. x 87 mm., to be provided with two-speed gear box and clutch controllable either by foot or hand, while the gears will be changed from the handle-bars. Price £96; coach-built sidecar, £28 extra.

THE 1919 CLEMENT.—Manufactured by Cycles Clément, 76, Grande Rue, Pré-Saint-Gervais, Seine. This firm is also concentrating on a single model: 4 h.p. twin-cylinder, V type, 64 mm. x 77 mm., two speeds and clutch, automatic lubrication, at £120.



The obvious advantage of the sidecar over any other type of light motor vehicle, so far as passenger accommodation goes, is well exemplified during the week ends. Sidecar outfits with four up are a common sight. The owner of the Clyno shown above appears to have solved the problem of carrying a family of six in a quite satisfactory manner.

Cognoscenti on the Saddle.

Among the machines on the Ripley Road last week-end were noticed a new Wooler, a twin Blackburne, a 1919 T.T. Rudge with handle-bars almost meeting the footrests, a gigantic J.A.P. in a light frame evidently home assembled, one of the latest T.T. electrically-equipped Harleys purring along at an easy 40, and a four-cylinder Henderson solo. Two-strokes were greatly in evidence, as was the ubiquitous Douglas.

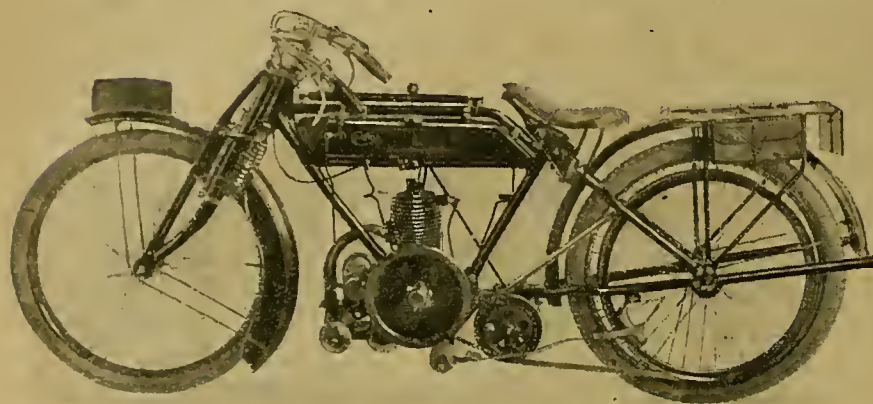
Sir Douglas Haig and the Signal Service.

The close touch that this journal kept with the motor cyclists in the Signal Service (R.E.) throughout the war renders Sir Douglas Haig's remarks regarding army motor cyclists of especial interest to our readers. From the very moment hostilities broke out the staff of this journal were busily engaged in helping the Government in every possible way in obtaining suitable recruits for this important branch of the service. In contrast to Lord French, Sir Douglas Haig refers to the motor cyclists as such. It may be recollected that in Lord French's first despatch he unfortunately referred to them as "cyclists," consequently a good deal of the honour due to these brave pioneers was lost to them.

Sir Douglas Haig's report is his last and deals with the advance into Germany from November 11th, 1918, until December 31st of that year. The report reads: "On the advance of our forces to the Rhine, telephone communication was established between General Headquarters at Montreuil and Cologne. Signal communication entailing the putting up of many thousands of miles of wire was provided also for the control of railway traffic, while to supplement electric communication generally a Despatch Rider Letter Service was maintained by motor cyclists. The amount of signal traffic dealt with became very great and on the lines of communication alone more than 23,000 telegrams have been transmitted in 24 hours. Similarly, at the General Headquarters, as many as 9,000 telegrams have been dealt with in 24 hours, besides 3,400 letters carried by despatch riders."

A New Lightweight on Standard Lines.

The Carfield Two-stroke embodying Well-known Components.



The 2½ h.p. Carfield two-stroke. The engine is a 2½ h.p. Villiers and the gear a two-speed Albion.

CONSIDERING the demand existing for motor cycles at the present time, it is perhaps surprising that more new firms have not come into existence to take advantage of the popularity of the motor cycle. In the car world upwards of thirty new motor firms have entered the industry, and, although the

call for motor cycles is even greater than for cars, only a few newcomers have been recorded.

One of these is the Carfield Motor Cycle Co., of Smethwick, Birmingham, which, though handicapped by inadequate temporary premises, has made a good start with a two-speed two-stroke light-

weight on the usual standard lines. It has a strongly built frame, particularly strengthened at the head, designed to accommodate the well-known 2½ h.p. Villiers two-stroke engine unit, with a standard Amac carburetter and a C.A.V. magneto.

The drive is taken through a Brampton ½ in. × ⅝ in. chain to an Albion countershaft two-speed gear box, of standard pattern.

The drive to the rear wheel is by Dunlop ⅝ in. belt, and the 26 in. wheels, which are finished all black, are shod with 2 in. Dunlop rubber-studded tyres. Ample wide mudguards and a very substantial carrier are special features, the latter incorporating two metal-cased toolbags. The rear brake is heel-operated, acting upon the inner side of the belt rim.

The other points of the specification are: Lycett's pan saddle, semi T.T. bars, and Best and Lloyd sight drip-feed lubricator. A well-formed tank carries one and a quarter gallons of petrol and a quart of oil. The filler caps are of large size.

Production commenced a few weeks ago, and several Midland agents have machines in stock, the selling price being £51.

A SPANISH MOTOR CYCLE.

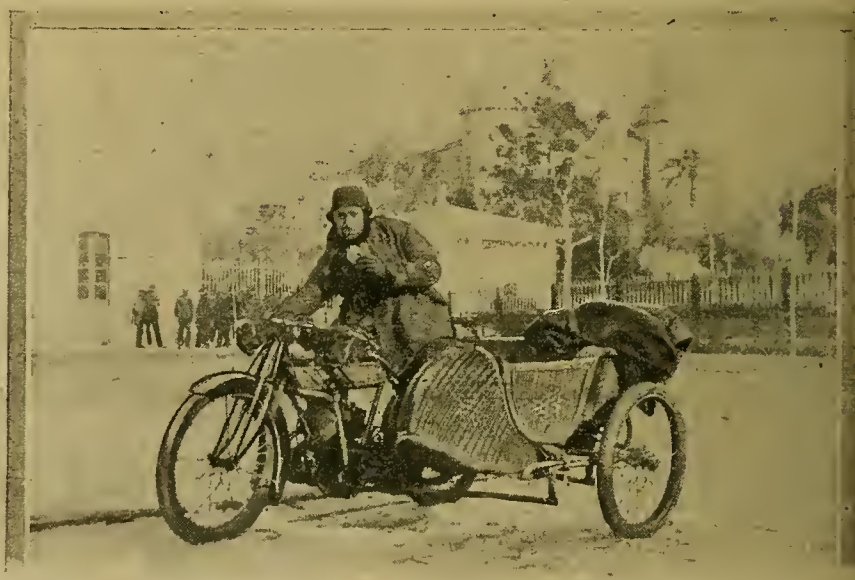
A SPANISH reader who is a motor mechanic, and has served with the Hispano-Suiza and other important motor firms in Spain, evidently is not content to import "foreign" motor cycles, and has completed a single-cylinder motor cycle, which has attained a speed of 64 m.p.h.

This engine has a bore and stroke of 85 mm., overhead valves, and is fitted with the builder's own carburetter, which, like the machine, he is calling the Cacharo, his own name.

A cone clutch and expanding pulley gear are operated by a long lever on American lines.

Señor Cacharo also built a two-cylinder machine with a 760 c.c. engine about two years ago, which, the designer claims, was the first motor cycle to be constructed in Spain.

Spain is rapidly coming to the fore as a motor cycling country, and, taken generally, the Spaniard is a keen sportsman, as witness the motor cycle events frequently reported in *The Motor Cycle*.



A twin sidecar outfit designed and built by Señor A. Cacharo two years ago.

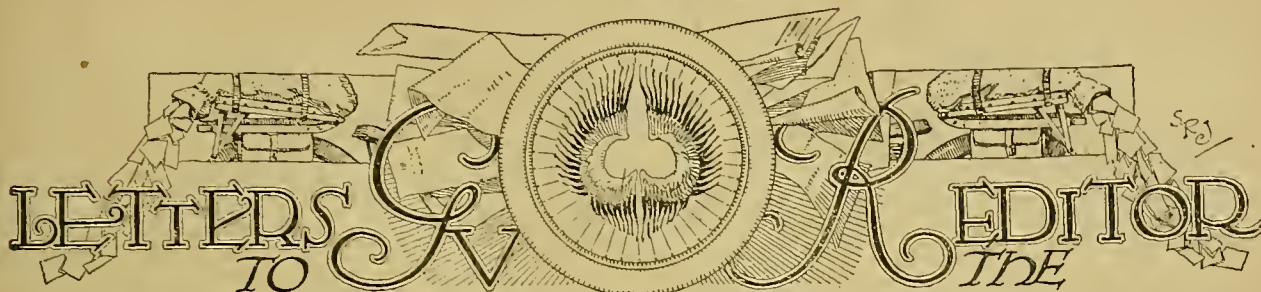
INTERNATIONAL MOTOR CONGRESS.

AT a recent meeting in Paris of the International Motor Congress, when the automobile industries of Belgium, France, Great Britain, Italy, and the United States were represented, the following resolution was carried:

"In view of the production during the present war by the automobile industries of the Allied countries of war material

of all kinds, and of the services rendered by automobile transport of the highest importance to the armies, and in view of the fact that motor transport of passengers and goods is now an indispensable condition in modern life, and that motor transport generally has ceased to be a luxury, and has become a necessity of commerce, the Congress recom-

mends that the internal taxes and duties of all kinds, direct and indirect, which fall heavily on automobilism in most of the Allied countries, be largely diminished in order to permit normal and progressive development of automobile communications; and that the product of these taxes and duties be applied to the upkeep and improvement of the roads."



The Editor does not hold himself responsible for the opinions of his correspondents.
All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

SINGLE-CYLINDER BALANCE.

Sir,—I am much interested in single-cylinder balance, and I may tell you that I am preparing a 370 c.c. single, which is better balanced than a modern flat twin, and its weight will be a little under 30 lb. Its fuel economy and m.e.p. will also be a little better than usual. The bore is 54 mm. and stroke 162 mm.

HUGO MOREN.

Rasunda, Sweden.

[A balancing device for single-cylinder engines, patented by Mr. Moren, was illustrated in *The Motor Cycle* of March 27th, page 296.—Ed.]

ROUGH TREATMENT FINELY WITHSTOOD.

Sir,—It may interest you to hear of the gruelling to which a friend and I subjected a 1914 6 h.p. A.J.S. and new Mills-Fulford sidecar in an attempt to reach a club meet at Moel Famman on Easter Monday.

Starting the climb from the Ruthin side, instead of, as we afterwards learned, from Mold, we kept climbing, under the impression everyone else was ahead. The "path," as you probably know, is simply indescribable, and the gradient in places—! To put it shortly, we reached the top, much to our own and several pedestrians' surprise. On regaining the main road, my friend took control, but within a few hundred yards the front wheel skidded on some loose stones, and, owing to an old wound, he was unable to straighten out, and we charged the right bank at speed. The whole outfit made two complete side somersaults, my friend underneath! On picking ourselves up, we found a cut on his leg the only casualty between us, whilst a very slight buckle in the sidecar wheel, a burst tube, and small dent in the top of the head lamp were the only damage. I really think all credit should be given to the makers for turning out work which will stand this treatment.

I have no connection with either of the firms mentioned.

J. W. WILLS.

ONE-LEGGED RIDERS.

Sir,—At the present moment there are many men who have lost the use of a leg, and who look to the motor cycle combination to solve the serious difficulties which arise in the matter of locomotion.

Being one of those who have lost the use of a left leg, I started some time ago to search the makers' advertisements in your paper to try and decide which make of cycle to purchase. Not finding the particulars I wished, I was compelled to write to various makers, asking them for particulars as to controls, etc., explaining that it was essential that the cycle should be manageable without having to use the left foot. In two instances I received courteous replies, in the remainder either no reply at all or else an advertising circular which carefully omitted the points I wished to ascertain.

Would it not be to the makers' advantage, at this present time, to give fuller details of their post-war models, of which, in the main, we are entirely ignorant? Alternatively, would it not be to their advantage to court the custom of a large body of men, of whom I happen to be one, by showing ordinary civility and consideration to them as potential buyers?

I have noticed the previous correspondence in your columns on this subject, which appears to have left the makers cold. Why do they not advertise "suitable for rider with right leg only," etc.?

GAMMY-LEG.

London.

COURTESY ON THE ROAD.

Sir,—I am always interested in "Letters to the Editor" appearing each week, and would like to ask you if you would put in one of your future numbers an appeal to the newer riders who are just taking up motor cycling to cultivate the old-time courtesy and chivalry which have so long existed on the road and always have been such a boon to anyone when in trouble on the roadside. I have been riding some years now, both a push bicycle and motor cycle, and have received help and advice, and returned them many times, until Easter Monday, April 21st.

I was travelling between Desborough and Birmingham, and after getting a few miles out of Market Harborough I picked up a wire nail about 2in. long. The result, rather a bad puncture. I pushed the sidecar right on to the turf on the roadside, and jacked up the cycle on the stand, which was just on the road. I then saw a steam tractor coming from Lutterworth way, and a motor cycle and sidecar from Market Harborough way. They came together just opposite me, and although there was room to pass the driver of the sidecar came so close in that he bumped my machine, spinning the number plate and rear lamp right up in the air, split the mudguard, and also dented it right across. I quite understand it was an accident, but he did not stop, although I heard the lady passenger remonstrating with him.

However, I do not want to make this a personal matter, but I am afraid that, without this old-time courtesy the open road will lose a lot of its charm.

C. J. WILLIAMS.

OBTURATOR RINGS.

Sir,—In view of the remarks made on this subject by a correspondent in your issue of April 24th, I should like to say that, as one who has been intimately connected with the use of these rings during the war, I can scarcely endorse the opinions expressed.

As far as can be seen they were introduced in order to permit steel cylinders having very thin walls to be used without cast iron liners. Any slight distortion of these air-cooled cylinders was compensated for by the elastic action of the obturators. Over and above this feature, however, it is difficult to see what advantage they offer. Piston rings have in all cases to be fitted in addition, in order to obviate excessive loss of oil out of the exhaust.

Replying to the points raised by your correspondent, I may say that, in my experience of hundreds of Clerget and Mono type engines fitted with obturators of all manufactures, the average life of a ring has been under fifty hours' running.

Taking the high cost of the rings into consideration, it is evident that, as a commercial proposition, they stand at a disadvantage as compared with the cheap, efficient, and robust step-cut piston ring.

Your correspondent's remark about piston rings being inefficient because the gases imprisoned behind them cause additional friction is rather curious, since it is just this property that causes the obturator to wear so quickly, while the piston ring remains practically unaffected.

In the latest rotary engines (B.R. type) the troublesome obturator has been abolished altogether in favour of the piston ring, on the lines of the Le Rhône, which has always been a favourite for this very reason.

I should be very glad to hear of anyone who is sorry to see the decadence of the obturator ring, excepting, of course, those interested in its manufacture.

London.

MOVIL.

LOOSE CRANKSHAFT.

Sir,—May I thank those motor cyclists who spent some time endeavouring to get my Scott motor cycle to start at the Wisley Hut a short time ago.

After trying every means it had to be towed home, and no doubt the reason of it not starting will be of interest.

The crankshafts had become loose on the flywheel, and instead of one piston being at the top and one at the bottom of the cylinders they both came to the top together. This, of course, would not allow any firing. E. LANGFORD.

A TABLOID HISTORY OF AIR-COOLING.

Sir,—“Pitot’s” letter on page 398 of *The Motor Cycle* for April 17th is simply potted nonsense. I do not want to be severe, but people should not rush into print without obtaining at least passable authority for their facts. So far from rotaries being more economical in fuel than stationaries of corresponding horse-power, they consume about one-tenth of a pint more per b.h.p. To put this more definitely, a 100 h.p. rotary uses approximately one gallon more fuel per hour than a 100 h.p. stationary; a 250 h.p. rotary uses two gallons more than a 250 h.p. stationary. “Pitot” utterly ignores the question of horse-power in his letter: he does not mention what sizes of rotaries and stationaries he is thinking of, and so tumbles into some such pitfall as comparing an 80 h.p. Gnome with a 400 h.p. Liberty, which is absurd.

He is also quite wrong about radials being “unproved.” He is evidently wholly unaware of the R.A.F. programme for 1919, though it has long been an open secret in the trade. He is, presumably, equally ignorant of the facts on which that programme was founded.

I give “Revs” up as a bad job on the “lost prop” question, after suggesting to him the Socratic method of arriving at truth.

In his opinion,

1. Does a lost prop remain stationary during a dive at 100 m.p.h. A.S.?
2. If so, why?
3. Failing (1), does a lost prop revolve backwards during a 100 m.p.h. dive?
4. If so, why?
5. Failing (3), does a lost prop revolve forwards during a 100 m.p.h. dive?
6. If so, what arbitrary factor prevents the engine from restarting?

TORQUE.

Sir,—The contention put forward by “Pitot” in the issue of April 17th would carry more weight if he had given more accurate figures in support of his case.

While admittedly wasteful in oil consumption, he does not consider rotary engines to be correctly stated to be wasteful of petrol. He mentions two rotaries by name, saying nothing of their horse-power, and compares their petrol consumption in gallons per hour with that of some unspecified stationaries.

The comparison as stated by him is absurd. If he can produce duly authenticated figures to show that the petrol consumption in pints per b.h.p. hour (the only comparative units) of a rotary is less than that of a decent radial (for naturally only air-cooled engines can be considered in this

connection), I will withdraw my statement that “Road Rider” was correct in maintaining a rotary to be wasteful of petrol as well as oil.

It seems to me that the rotary was doomed as anything but an historical war-time make-shift the minute the palm for low weight for power was allowed to fall into the hands of the radial. REV.S.

IN THE FUEL WORLD.

Sir,—With reference to an article entitled “In the Fuel World,” published in *The Motor Cycle* of April 10th, I call to mind an analytical chemist’s discovery of a process by which alcohol could be extracted from beer (without affecting in any way the medicinal qualities or constitution of this drink) in sufficient quantities as to be able to place methylated or benzolised alcohol on the market as cheaply as, if not cheaper than, petrol. In the process of de-alcoholising beer, alcohol becomes merely a cheap by-product.

I am acquainted with the inventor, and know the struggle he has had, for ten years, with the Excise authorities, to be allowed to exploit his invention, but in vain. He was allowed to patent his process, had the trouble and expense of erecting a factory, etc., and then was forbidden to manufacture de-alcoholised beer, even in the smallest quantities. After a long battle with the Excise, he took his process to the United States of America. Here it was received, literally, “with open arms.” The Government of the U.S.A. at once altered the whole law of the country to meet this one patent alone with their (originally British and antiquated) Excise laws. It has been forcibly put before our Parliament, but Messrs. Dilly and Dally of the Excise authorities are inexorable, and as a consequence the poor motorist has to suffer. A.M.J. INST. ENG.

Newark.

IN STOCK.

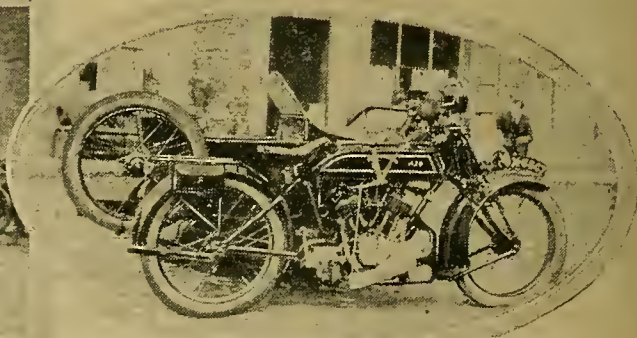
Sir,—I am very glad to see this question has been put before you and to read your correspondent’s remarks.

Recently I saw two advertisements for “1919 models in stock” of a certain make I am anxious to obtain, but on telephoning the advertisers I was told, in each case, that the motor cycles had been sold the day before the advertisement appeared. One firm said it would be pleased to book my order and would give me delivery in six weeks’ time! This firm’s advertisement appeared again in *The Motor Cycle* for April 17th.

There is also a firm who advertises regularly certain accessories in stock. I have for several weeks now communicated with it, but I am always told “Nothing at the moment, but deliveries are expected in any time now, probably this afternoon.” When I called on the firm two or three weeks ago I asked why it advertised articles as being in stock when they had nothing to offer, and they told me it was “not their fault if the goods had been sold after the advertisement was in the printer’s hands”; but the advertisement still goes on in various papers week by week. I was told that if I would leave a deposit the firm would supply what I required in strict rotation, and showed me copies of several receipts for deposits on orders placed that morning.

East Sheen.

X.Y.Z.



A fair number of members of the Newcastle and District Motor Club turned up on Good Friday for the opening run to Allendale. Powerful sidecar outfits predominated, one of the smartest being a new A.J.S. (on right) owned by the trials secretary.

HORSE-POWER RATING.

Sir,—Surely it is now time something was done to abolish the present haphazard and often deceptive method of rating the horse-power of engines. This is especially noticed among the small two-strokes, all sorts of different bores and strokes claiming to be $2\frac{1}{2}$ h.p. Would it not be possible to get makers to agree to a fixed ruling? I would suggest 100 c.c. per h.p. Then the capacity or h.p. could be read at a glance, i.e., 350 c.c. would be 3.5 h.p. and 270 c.c. 2.7 h.p., etc., and everybody would know what was being offered him. The rating suggested would come well within the actual h.p. developed.

P.R.A.

London.

[This suggestion has already been made in *The Motor Cycle* more than once.—Ed.]

PULLEY GRIP.

Sir,—We were interested in "Graduate's" and R. L. Boyd's letter on this subject, and would like to make it clear that the belt does actually pull the pulley flange inwards (due to the curved slot), but it must be borne in mind that the pull is also re-acted upon by the load on the engine, and we have found in practice that there is a balance formed between the two pressures. The reason we have put a ball thrust on the inner side is that we find that many riders use the belt much too short to allow of the higher gears being used without forcing the pulley inwards with unnecessary pressure. Hence the necessity for a ball thrust.

GRADO, LTD.

Sir,—In reply to Mr. Boyd's letter *re* the Grado Gear, I beg to state that the gear does not work satisfactorily with a Whittle belt. This is owing to the lack of friction between cast iron and leather, also the tendency of the leather belt to glaze when running with cast iron.

The pulley depends upon the surface grip on the metal for its satisfactory action on the low gear; and with a rubber belt the low gears work well.

I have run a Grado for some time, and have effected a vast improvement by fitting a ball thrust between the collar and loose pulley side, also in fitting a hardened steel roller on a pin working in the special slot in the pulley boss.

H. W. TATTERSFIELD.

A STATIONARY PROP.

Sir,—In view of the recent discussion in *The Motor Cycle* about losing one's prop., the enclosed photograph may be of sufficient interest for reproduction in your paper. The photograph, which I took from the front seat of a BE2e, shows the propeller absolutely stationary. The height was 4,000 feet. There was no difficulty in starting the engine, an eight-cylinder stationary R.A.F., after quite a short dive.

I have more than once been a passenger in a BE2e when my pilot has purposely "lost his prop." On no occasion was there any difficulty in starting the engine by diving.

London.

STALL.

**THE NEW A.B.C.**

Sir,—I should like to thank Mr. Bradshaw for the able way he has replied to my criticisms, but I cannot agree with him on all points.

He says it is the old question of accessibility, reliability, etc., where the design calls for sacrificing one for another. I am sorry to think with regard to accessibility combined with neatness that he is not much nearer solving this question than designers did in 1910.

I should like to say that I rode a motor cycle before that year which was as near my ideal (except the springing) as machines are to-day, and it did not have a gear box hung on to the bottom bracket with clutches, etc., sticking out (quoting Mr. Bradshaw's words), but it had three speeds and a clutch which were entirely satisfactory—silent, neat, and clean.

I think that accessibility and neatness have been sacrificed (as far as one can judge by diagrams) because even if the whole unit can be taken out with one spanner and a pair of pliers it does not mean to say it is accessible. Supposing, for instance, the clutch were to get out of order (the best designed ones do sometimes), this means taking out and dismantling the whole unit; whilst a clutch which is hung on can probably be put right (anyhow made to do the driving) in a short time on the road.

He also mentions a noisy high speed front chain in a bulky chain case. Again, if anything goes wrong with this it can generally be remedied on the road, and in these days of silent chains and neat oiltight chain cases it is not necessarily any more noisy than a high speed bevel, which has been known to break, with dire results.

I like the novel way in which Mr. Bradshaw splits up a single chain drive into two; even so, it is then as efficient as a bevel if properly enclosed.

He mentions the advantages of the mechanical oil pump. I agree it has some over the hand pump and drip feed lubricator; but one of the chief advantages of the latter is that you can see it working, and vary the quantity of oil to suit the load on the engine. For instance, if the machine is doing 30 m.p.h. with the throttle nearly shut the engine does not require so much oil as when going up hill at the same speed with the throttle fully open; also, in my opinion, it requires more oil when going slowly than when going fast with full throttle. Another point in favour of the drip feed lubricator is that you do know the engine is getting fresh, cool oil instead of using the same hot oil over and over again as it generally does with a mechanical pump, which supplies oil in direct proportion to engine speed, which is obviously wrong, as the above shows.

H. WALKER.

Sir,—I am interested in the correspondence with reference to the A.B.C. motor cycle, and much appreciate the letter from Mr. G. Bradshaw in reply to his critics.

As an engineer and motor cyclist of fifteen years' experience, I am familiar with practically every well-known machine on the market, and in my opinion the A.B.C. is well ahead in design.

As Mr. Bradshaw says, it is always a question of compromise.

At last we have a motor cycle of ample power but light weight, properly sprung fore and aft, with a lubrication system equal to the best motor car. It is the transmission that I admire most, and I have tried both belt and chain drive. Surely nothing could be better or more efficient under road conditions than a good bevel drive running in oil, and a slow-speed chain. It seems absurd to talk of power being absorbed by the gears when one considers the advantages of such a system.

The standard type of machine with its countershaft gear, added as an afterthought, its two chain cases, etc., does not compare with the neat unit of the A.B.C. I cannot help thinking that Mr. Bradshaw will eventually enclose his chain, and certainly abandon the oil spray. I have tried it, and, although no doubt ideal with an enclosed chain, it is not a success in dusty weather with an exposed one. However, Mr. Bradshaw assures us that it is being tried.

In my opinion, the A.B.C. is a really beautifully designed machine, and, moreover, is thoroughly practical, and ought to be ideal, either for solo or sidecar work. What other motor cycle really is?

I have no more interest in the A.B.C. than any other machine commercially, but I am looking forward very much to having one.

Penrith.

GEORGE TAYLOR, A.M.I.A.E.

A USEFUL BOOK FOR MOTOR CYCLISTS

HINTS AND TIPS FOR MOTOR CYCLISTS.

One of the most useful handbooks for motor cyclists. It is full of valuable information and "wrinkles" relating to the purchase, driving, adjustment, management, equipment, repair, servicing, etc., of motor cycles. A feature of the present edition is the inclusion of illustrations showing the working of motor cycle engines—both two-stroke and four-stroke.

Price 2/- net. Bx net 2/3.

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ILIFFE & SONS Ltd., 20, Tudor Street, London, E.C.4.
or of leading Booksellers and Railway Bookstalls.

SOUTH WALES HILL-CLIMB.

SOME good sport was obtained at the Ystalyfera and Swansea Valley M.C.C. hill-climb, the results of which are given below:

CLASS I.—LIGHTWEIGHTS.

	m.	s.
J. Evans (2½ New Imperial) ...	1	25½
G. Cook (2½ Royal Enfield two-stroke) ...	2	0

CLASS II.—UP TO 4 H.P.

W. Leyshon (3½ Norton) ...	1	59½
Capt. A. Lindsay (3½ Norton) ...	1	6
Capt. A. Lindsay (3½ Scott) ...	1	9
D. E. Rees (3½ Sunbeam) ...	1	14
Glyn Rees (3½ Premier) ...	1	15
J. Morgan (3½ Premier) ...	1	16

*Fastest time of the day = 42 m.p.h. approximately. An excellent climb.

CLASS III.—UNLIMITED CAPACITY.

Capt. A. Lindsay (3½ Norton) ...	1	1
W. Leyshon (3½ Norton) ...	1	4
Glyn Rees (3½ Premier) ...	1	13½
D. E. Rees (3½ Sunbeam) ...	1	14
— Lyddon (3½ Premier) ...	1	18
J. Andrews (3½ Triumph) ...	1	24



W. Leyshon, 3½ h.p. Norton, who made the fastest time of the day at the Ystalyfera and Swansea Valley Hill Climb.

MINISTRY OF WAYS AND COMMUNICATIONS BILL.

THE following are extracts from a memorandum prepared by Mr. Rees Jeffreys, late secretary to the Road Board, at the request of the Motor Legislation Committee, and which proposes a number of amendments to the Ministry of Ways and Communications Bill:

"The Minister has undertaken that there shall be a separate Department for roads under General Maybury. General Maybury should be assisted by a Board Committee consisting of representatives of associations of highway authorities and traffic organisations. It should be provided that the Minister shall appoint a Road Committee of not fewer than ten members (exclusive of the head of the Department, who shall be the chairman of the committee), of which five members shall be representatives of local authorities, and five shall be representatives of road traffic problems. The following provisions are suggested:

"(a) That all roads shall be put into one of three classes. Class 1.—Arterial

roads or main lines of road communications. Class 2.—Secondary roads. Class 3.—Local roads.

"(b) That to Class 1 roads a grant of 50% per cent. of the cost of maintenance shall be paid; to Class 2 roads 25%; Class 3 roads to remain a local charge.

"It should be provided in the Bill that the Minister shall have power, on the advice of the Road Department or Board to prescribe the minimum width of arterial roads, i.e., to issue regulations providing that for the roads specified in the regulations no new building shall be erected within so many yards of the centre of the highway, without prejudice to the powers of local authorities to prescribe a greater width for that portion of the road passing through their areas. Similar powers should be conferred on county councils to conserve the width of Class 1 and Class 2 roads within their areas. At present new houses are often allowed to be built up to the edge of a narrow but important road, without sufficient space being provided even for a footpath. The inevitable result is that the passage

is permanently narrowed, or the local authority is put to the expense of securing the land and demolishing the buildings erected."

CORK M.C.C. MEMBERS' TRIAL.

THE Cork and District Motor Cycle Club held its second competition of the season on the 21st ult., when a members' reliability trial was held from Cork to Glandore and back. A very large number of prizes were offered in the event, and twenty-one competitors were sent away from Victoria Cross at 10 a.m. at customary intervals, as under:

D. Lucy (2½ Douglas), J. Gibbings (4½ B.S.A.), J. H. Wilson (3½ Rover), J. P. Frost (6 Enfield sc.), M. J. Hegarty (2½ Douglas), W. Waterman (7 Indian sc.), J. Atkinson (6 Ariel sc.), J. Ryan (2½ A.J.S.), W. Musgrave (4 Triumph sc.), C. G. Goode (5 Vindec), C. O'Connell (Baby Levis), D. Foley (3½ Rudge), S. R. Hosford (3½ Zenith), G. H. Ogilvie (4 Triumph), R. S. Russell (2½ Revere), F. B. Russell (4 Triumph), J. H. Watson (2½ Revere), E. Manley (2½ Sun), M. Murphy (4 Bradbury sc.), T. R. Popham (6 Enfield sc.), and J. Duggan (6 Enfield sc.).

The outward journey, *via* Ballinspittle, Timoleague, Clonakilty, and Leap, was not marked by any incident of note, save that Goode (Vindec) was in trouble and had to retire, while R. S. Russell, the popular hon. secretary, suffered from a broken magneto chain, and subsequently from a seized engine. Most of the others were on time at the luncheon stop. The return journey was made by the direct route through Bandon. Before reaching Cork three secret checks were taken, and as the margin of time allowed at the open controls was liberal, it is probable that these will decide the destination of the awards, which will be announced later. Sixteen of the starters completed the journey.



A gathering of the members of the Portsmouth N.M.C.F.U. prior to the opening run of this southern branch of the Union

LITTY

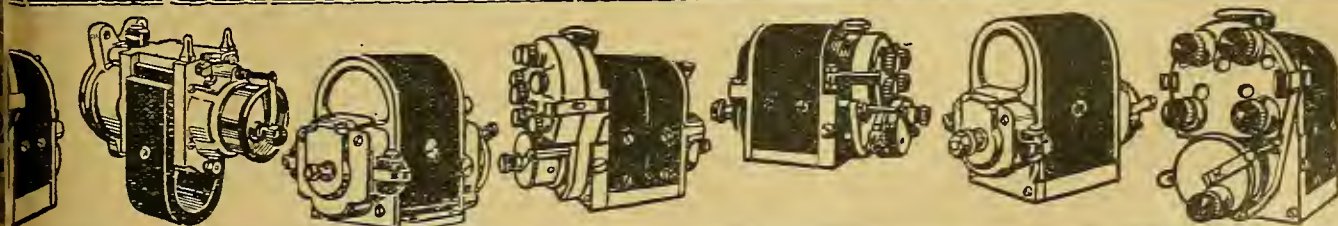
BRITISH MAGNETOS are better than any pre-war magnetos.

British Magnetos are being manufactured in ample numbers and types to cover all the possible requirements of British Manufacturers and Motorists

We, the following makers of British Magnetos, invite your enquiries for particulars of our various models.

British L.M. Ericsson Manufacturing Co., Ltd., Beeston, Notts.
British Thomson-Houston Co., Ltd., Coventry.
E.I.C. Magnetos, Ltd., Birmingham.

M-L Magneto Synd., Ltd., Coventry.
North & Sons, Ltd., Watford.
Thomson-Bennett Magnetos, Ltd., Birmingham.



Godbolds

In answering this advertisement it is desirable to mention "The Motor Cycle."

A35



The G.N. is exceptionally accessible. The detachable cylinder head, always a feature of the G.N. engine, and now being widely adopted by other makers, is extremely simple to detach, no skill, either, is needed in re-making the joint. Decarbonisation is thus doubly simplified, for not only is the head easier to detach than the ordinary cylinder, but the carbonised surfaces are immediately "getatable."

In the event of tyre trouble, the easily detachable wheel can be replaced by the spare, which procedure will appeal to owners of sidecars, combinations, in which structural design impedes tyre replacement. Further details and specifications from

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Hendon,
N.W.4.

Raymond

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Telephone: City, 4432.

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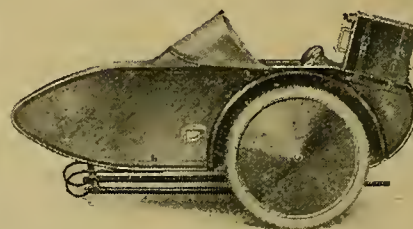
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MANCHESTER.

Contractors to H.M. Government.

SCIENTIFIC DESIGN, combined with twelve years experience, make the 1919 **HENDERSON SIDECARS** better than **THE BEST**, and they must not be confused with the usual standard of sidecar construction.

RUSTLESS STEEL, special unbreakable alloy steels, springs of wonderful resiliency, chassis free from rattle, lightness combined with strength, etc., etc., **ARE FEATURES EXCLUSIVE to HENDERSON SIDECARS**, each one being guaranteed for **ONE YEAR**.

The Famous Model "A" Feather-weight.



Model "Elite."

The Last Word in Scientific Sidecar Construction
EARLY DELIVERY OF ALL MODELS.

Illustrated Catalogue free.

HENDERSON SIDECARS, AERO WORKS, Sheffield

Leonard B. Henderson, A.M.I.A.E., Designer

A Privately Constructed Runabout.

Neat Three-wheeler on Morgan Lines.

THE privately-built runabout illustrated here is the work of Lt. W. G. Watson, R.N.V.R., of Spencer Park, Wandsworth Common, S.W., and is one of the few "amateur" productions we have seen which is not a contraption.

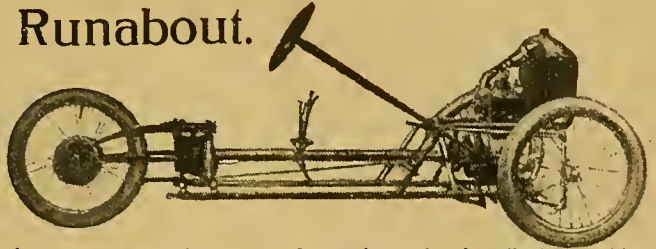
As will be seen from the photographs, Mr. Watson has taken the Morgan for his pattern, both as regards the frame design and the transmission system.

The engine fitted is a water-cooled 12 h.p. Spake-de-Luxe, an American make, which was used extensively by the makers of cycle cars in the U.S.A. This is supported on the lower members of the frame and behind the "axle" tubes. The radiator is located before the engine on the upper extensions of the duplex frame.

A leather-faced cone clutch is incorporated in the large outside fly wheel, and the drive is taken to the rear by an enclosed propeller-shaft, *via* a large diameter leather universal joint. Ball bearings are fitted at both ends of the shaft.

The gear reduction is by bevel wheels enclosed in a case, hence by two chains to the back wheel, the two speeds being obtained by dog clutches mounted outside the gear box.

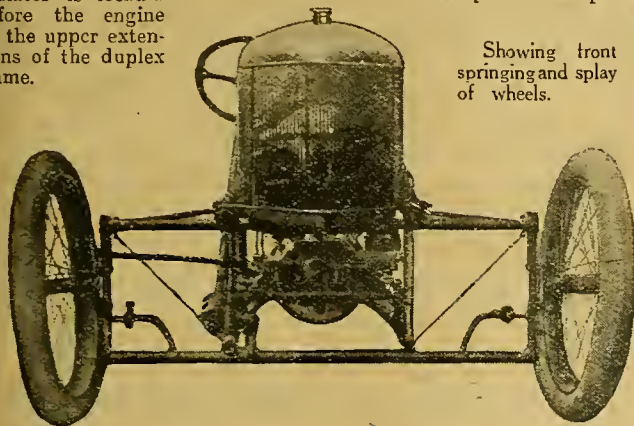
Both front and rear springs are shown clearly in the photograph, and conse-



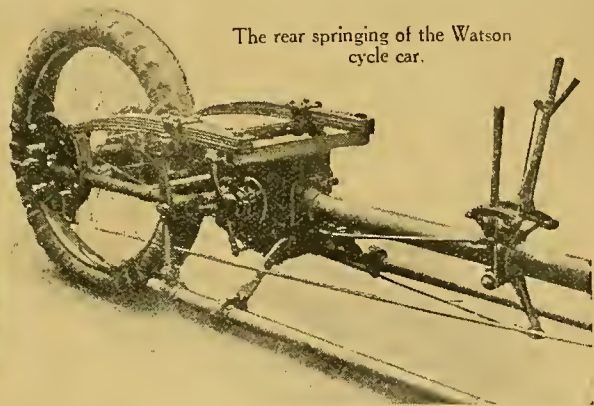
quently need not be described. Braking is by means of two internal expanding brakes operated by hand and foot. The hand-brake lever and change-speed lever are mounted on the central tube.

Steering is by worm and sector, and the wheelbase is 7ft. 10in., track 4ft. 2in.

The whole of the machine, excepting the engine and radiator, was made by Mr. Watson in just over nine months.



Showing front springing and splay of wheels.



The rear springing of the Watson cycle car.

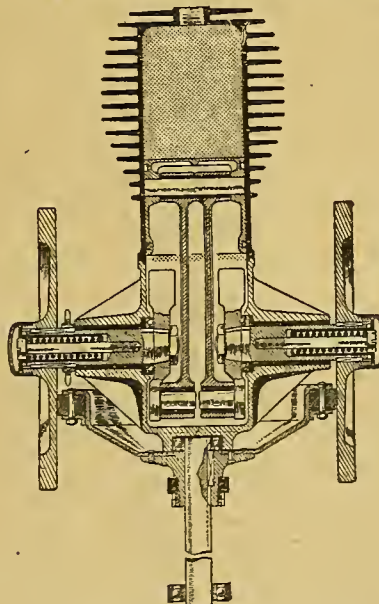
A Variable Friction Gear and Engine Unit.

An Ingenious Design to give Two Points of Contact in Friction Gear.

THERE is much to be said in favour of the friction drive, when properly carried out, for the propulsion of motor cycles and cycle cars. It gives a graduated range of gears between its extreme limits, which enables a rider to suit his gear to every slight variation in the gradient or other conditions which may be experienced. We illustrate an ingenious adaptation of this gear herewith. The two-stroke engine to which it is applied has very much that is novel in its construction. For convenience, the drawing shows the cylinder in a horizontal position, but it will be readily understood that it may be also placed vertically.

The inventor, Mr. T. S. Smith, describes his idea as follows: "The design of this gear aims at the removal of the only probable source of trouble with friction gears, i.e., slip. The drawing shows the device adapted to a single-cylinder engine, but it is equally adaptable to a 'V' or opposed twin.

"The two flywheels of the engine serve as the driving discs of the gear, and are revolved in opposite directions by means of two connecting rods, which are fulcrumed in the piston on the same gudgeon pin. Springs are arranged on the crankshafts to keep the discs in engagement with the driven wheel, ball bearings being suitably disposed to sus-



An unusual design of engine and friction gear, by T. S. Smith, in which are incorporated two connected rods and crankshafts rotating in opposite directions.

tain the thrust. This arrangement of two driving discs in contact with the driven wheel on either side removes all unequal side pressure on the latter and reduces friction and consequent bearing wear to a minimum. Moreover, the use of two light connecting rods revolving in opposite directions in place of one heavy one will conduce to better engine balance and reduce vibration. It will also eliminate the side thrust of the piston on the cylinder walls. The driven wheel may be built up or made with spokes to serve as vanes, which will induce a draught of air on to the engine cylinder and assist cooling. A shaft transmission embodying a clutch, with bevel or spiral gear drive on to the rear wheel or axle, would constitute an admirable transmission system, for either motor cycle or light car. The gear, however, may be used in conjunction with a belt or chain drive as the final drive, if desired.

"Referring to the drawing, no attempt is made to show accurate detail, but simply to illustrate the general principle of the device, which offers a cheap-to-make, foolproof, infinitely variable gear, which, if used with shaft drive, would make an ideal transmission."

There appears to be no reason why this system of transmission should not be adopted with advantage for cycle cars.

QUESTIONS AND REPLIES

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C.4, and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

Pre-ignition.

? My 2½ h.p. O.K. runs at about 20 m.p.h. for about five miles on full air and two-thirds gas; it then slows down and goes no faster than 10 m.p.h., when I have to retard air one-third, gas two-thirds advanced, till it stops altogether. After I let the engine cool down it runs well until it again behaves in similar fashion.—A.W.

The trouble of which you complain is probably pre-ignition caused by the use of an unsuitable plug, the points of which become incandescent and then cause the symptoms of which you write.

How to find the C.C.

Please tell me how to obtain the c.c. of an engine in both English and French measurements.—L.S.D.

The following is the formulæ for finding the cubical capacity of an engine:

$$D^2 \times .7854 \times S \times N.$$

D = Diameter of cylinder.

S = Stroke.

N = Number of cylinders.

This holds good for both French and English measurements, and gives the result in cubic millimetres and cubic inches respectively. The measurement is usually given in cubic centimetres, to get which divide the cubic millimetre by 1,000.

A Four-cylinder F.N.

? I recently purchased a second-hand F.N. four-cylinder, fitted with Bosch magneto and F.N. carburetter. Before delivery to me, the owner riveted a patch on the connecting rod, in order to strengthen a weak place, and fitted two new piston rings. (1.) I can now get it to run (after dopping through the induction pipe) for a distance of about two hundred yards, when it stops dead, without any knocking or signs whatever. The magneto seems all right; also the petrol supply to the carburetter. (2.) During running the cylinders heat up considerably. Can I do anything to keep them cool, or is it the usual thing? The machine, I may mention, is fitted with automatic inlet valves.—C.M.

(1.) Without actually seeing the machine it is very difficult to say what is the matter with it. It looks as if the carburetter is choked by some foreign matter; therefore the petrol system should be thoroughly and carefully overhauled. (2.)

The cylinders are bound to heat up; this is only natural, and they often reach such a temperature that you cannot bear your hand upon them. You can easily tell if the engine is overheating, by the fact of its knocking and losing power. The inlet valves should be examined, and you should see that each opens to the same degree, that the springs are fairly strong and have an equal tension. It seems as if a new connecting rod may be needed, as patching would be hardly safe, we should imagine.

Gears for Sidecars.

? (1.) I am in possession of a 3½ h.p. Humber Combination geared at 4 to 1 and 8 to 1. Do you think these gears too high for work on the Yorkshire hills? (2.) The driving pulley is 5in. in diameter. If I fit a 4in. pulley, what gear shall I get? (3.) When running on benzole, should I give a less opening of the air lever than that given to the petrol lever? (4.) What is the approximate amount of oil to petrol on the above machine?—W.A.C.

(1.) The high gear should be at least 5 to 1. (2.) If the 5in. pulley gives 4 to 1, the 4in. will give 5 to 1. (3.) Benzole requires much more air than petrol, and it is advisable to fix an extra air device on the induction pipe. (4.) The oil consumption is about 550 miles to the gallon, or eight times the petrol consumption.

Storing a Motor Bicycle.

? I have recently purchased a 2½ h.p. New Imperial motor cycle fitted with a two-speed gear, and I should be glad if you would answer me the following questions: (1.) As the machine will not be used much for some time, should the tyres be left pumped hard and the belt left on the pulleys whilst standing? (2.) Is the neutral gear only fitted for convenience in wheeling the machine about, or may it be used when descending long hills? Would any harm be done to the machine when top gear was again engaged at the bottom of the hill if the speed were high?—D.C.L.

(1.) Jack up both wheels, and leave the tyres moderately soft. The belt should be removed from the pulleys. (2.) The neutral gear is only for convenience in wheeling the machine about. If used for descending long hills, the dogs may be damaged while attempting to engage the high gear.

Fitting a Magneto Switch.

? Will you please explain to me how I can fix a magneto cut-out to my Douglas? Please explain as simply as possible, as I have only just taken up motor cycling. Also, please inform what I shall need to buy.—W.E.A.

If there is not a terminal on the contact breaker cover, write to the makers of your magneto for one, and on receiving it connect a wire from a switch on the handle-bar to the terminal on the contact breaker cover.

A Cracked Cylinder.

? I have had the misfortune to break the cylinder of my 4 h.p. 1913 Bradbury. Can you account for the fracture? I have had back fires when starting, but the only conclusion that I can come to is that the piston stopped exactly at top dead centre, and that the explosion had to move something; but even then the pressure is only 160-200 lb. per sq. in.—is it not?—which it should have been able to withstand.—A.T.S.

The fracture was probably caused by screwing up the holding-down nuts of the cylinder unequally, and is hardly likely to be due to any fault in manufacture or material. The explosion pressure may be as much as 350 lb. per sq. in.

Fitting a Speed Gear.

? (1.) I wish to fit some form of gear to my 1913 clutch model Rudge motor cycle. If I fit a Rudge-Multi gear, would any alteration to the frame be necessary? (2.) Shall I require a new half crank case if I fit the Rudge-Multi gear? (3.) Is there any countershaft gear that I can fit to this machine? (4.) Can you recommend any two or three-speed hub gear (without hub clutch, if possible) that would be suitable for this machine?—B.V.S.

(1.) We do not think any alteration to the frame is necessary, but you had better communicate with the makers, Messrs. Rudge-Whitworth, Ltd., Coventry. (2.) New half of crank case will not be required, but the crankshaft of the single-gear model may be too short. (3.) You can fit an Albion change-speed gear by obtaining lugs and connections from the makers of the gear, Messrs. The Albion Engineering Co., Upper Highgate Street, Birmingham. (4.) The Sturmey-Archer three-speed hub would be suitable. Write the makers, Messrs. Sturmey-Archer Gears, Ltd., Lenton, near Nottingham.



SHOULD THE DEAF AND DUMB USE MOTOR CYCLES?

In view of this question, which is frequently brought up in our columns, the photograph has exceptional interest. It is unique in the fact that the riders are all deaf and dumb. It is their intention to form a social and motor cycling club in the Midlands.

Lubrication.

I have a 2½ h.p. two-stroke Ivy. Please tell me : (1.) If the petroil system of lubrication is satisfactory when running on benzole, and, if so, how much oil per gallon should I use? (2.) Please tell me how to prevent the plug from fouling. Is this due to insufficient air or excess of oil, or perhaps both?—E.S.A.

(1.) The petroil system of lubrication is satisfactory with any fuel (use half a pint of oil to one gallon of fuel), but it is somewhat messy. (2.) The trouble might be due to both causes; it is best to use a plug with a rather thick electrode if you can obtain one.

Difficult Starting.

(1.) I have a 2¾ h.p. 1914 two-speed two-stroke, which I have to push from ten to fifteen yards before it will fire; but even when it does fire, it repeatedly misfires after a couple of minutes, and on hills it will gradually slow and eventually stop. (2.) Also, when wheeling the machine with all levers set for starting, smoke issues from the carburetter (a Senspray). Should this be so? (3.) I am using benzoline as fuel. Is this correct, or should it be mixed with something else?—W.C.G.B.

(1.) The machine seems to start fairly easily if it will start in ten or fifteen yards. The misfiring may be due to a variety of causes: too large a jet (which we rather suspect is the case) or to water or other impurities in the fuel. (2.) This is nothing uncommon, and you need not let this worry you. (3.) The fuel you are using is probably benzole. This will be quite in order, either mixed with petrol or used neat. It should, however, contain no impurities. In some benzole now on the market there is a certain quantity of water, and it should, therefore, be strained through a very fine gauze.

Loss of Water.

In driving a 1916 G.P. Morgan I find that after running for about half an hour on top gear, the engine fails to pull properly. On examination, it was found that a great deal of the water in the radiator had evaporated, and had to be replenished. While running for one and threequarters of an hour entirely on bottom gear (during which time a distance of twenty-eight miles was covered), the water in the radiator showed no signs of boiling. I should be much obliged if you could advise me regarding the possible cause of the trouble.—M.S.D.

Without actually seeing the machine it is a little difficult to say what is the matter with it, but it looks very much as if there is a leakage of water somewhere, as an appreciable amount should not evaporate. We should therefore recommend you to look to the radiator and all connections, and see that they are water-tight. Why run for so long on low gear?

READERS' REPLIES.

Difficult Starting.

As an all-weather and all-winter rider for the past seven years in the cold, inclement North, and having fully experienced the weight and worries of war petrol, the following simple device completely solved my heart-breaking starting difficulties. Instead of pushing rag into the air intake I have a piece of strong cloth (carpet 1½ in. x 2 in.) which hangs loosely from a piece of wire or ring around the throttle wire of the Amac carburetter. When starting I fix this piece of cloth tightly over the main air intake. Then sprinkle the cloth with petrol until saturated or dripping. With everything else in order a push of a few yards gives a splendid start. Whatever air is sucked through the cloth vaporises the petrol and supplies a good firing mixture for 200 or 300 yards. Suction keeps the cloth rigid against air intake, or a bent pin projecting from

a wire gauze cover will secure this sufficiently. After a couple of hundred yards a slight touch of the hand will brush the piece of cloth aside from the air intake, and being fixed on a loose ring it will naturally fall or get blown round behind the carburetter, where it will be always clean and ever handy for use. Anybody can suit the above device to any other make of carburetter. I have a hazy recollection that I saw this tip hinted at in your ingenuity-developing paper some six years ago. But it took stubborn war petrol to requisition many of your invaluable hints, which some of us may have then regarded as primitive and superfluous.—HO KUKLOS, Killygordon.

In reply to "A.G.," who has difficulty in starting a 1913 Rex, I think the trouble is caused by the sticking of the high gear clutch. If the operating pin does not come out this is the cause. I have just had a taste of it, and was a long time in making the discovery.—J. D. MACPHERSON.

EXPERIENCES WANTED.

E. Whittaker (Batley) would like readers' experience with the Grado-Multi gear for sidecar work with a 4 h.p. engine.

RECOMMENDED ROUTES.

CHATHAM TO BRIGHTON.—F.P.B.

Chatham, Maidstone, Nettlested, Tunbridge Wells, Crowborough, Uckfield, Lewes, Brighton.

CANNOCK TO BLACKPOOL.—N.W.

Cannock, Stafford, Eccleshall, Woore, Nantwich, Tarporley, Warrington, Ashton-in-Makerfield, Wigan, Preston, Blackpool.

WOLVERHAMPTON TO HOLYHEAD.—R.S.

Wolverhampton, Wellington, Shrewsbury, West Felton, Llangollen, Corwen, Pentre Voelas, Bettws-y-Coed, Capel Curig, Bangor, Holyhead. Approximately 120 miles.



The A.V. Cycle Car.

The little single-seater shown on page 533 of the issue of April 3rd is the latest type of A.V., and is manufactured by Messrs. Ward and Avey, Ltd., Somerset Road, Teddington.

To Handle the Wooler.

Mr. A. C. Robins, who was a skilled rider of a Humber in 1910-11-12, and who drove a Triumph in 1913 and a L.M.C. in 1914, has now been appointed assistant sales manager of the Wooler Engineering Co., Ltd., Alpertown.

A New Repair Depot.

We understand that a repair works has been opened for Matchless motor cycles under the title of the Matchless R.P.R. Works, 160, Regent's Park Road, London, N.W.1. and that Messrs. H. Castell and H. Wright are the works engineers.

Reports on Machines.

Any motor cyclist requiring independent opinion on either motor cycles or cars in the Manchester district may be interested to know that E. Woods, A.M.R.Ae.S., Campfield Chambers, 312, Deansgate, Manchester, is prepared to make such reports.

New Garage in Cork.

Jack Healy, well known in trade circles as "Tim," the popular Irish competition rider, has been demobilised from the Army, in which he has been serving as a despatch rider since 1914. He has opened a garage in Cork, with the A.J.S. and Norton agencies.

Fire at Tyre Works.

The works of the Beldam Tyre Co., Ltd., having been partially destroyed by fire, the manufacture of inner tubes and the Combination "V" steel-studded tyre, and all retreading work, is temporarily suspended. The all-rubber tyre output, however, will, fortunately, not be interrupted.

Premier Three-wheelers.

The ownership of the Premier name in connection with motor cycles and cars has long been an uncertainty, so far as the public is concerned. The original Premier Cycle Co., now the Coventry Premier, Ltd., made Premier motor cycles, and are producing the Premier super runabout, a three-wheeler of promising design. The Premier Motor Co., of Birmingham, made Premier cars, but had no connection with the original Premier Co. Later the latter concern made a three-wheeler, which was known as the P.M.C. Finally, there is the Premier Motor Engineering Co., of Bolton, who are introducing the M.B. three-wheeler. All this is very confusing to the buyer of three-wheelers, new and second-hand.

Belt Slip.

The majority of riders of belt-driven machines have had the annoying experience of a slipping belt, generally on a wet and disagreeable day. An excellent antidote for belt slip is Sterns's belt brick, marketed by Messrs. Sterns, Ltd., of Royal London House, Finsbury Square, E.C.

Booklets.

Messrs. J. A. Prestwich and Co., Ltd., Northumberland Park, Tottenham, London, N.17, inform us that their booklets, which give valuable information concerning the J.A.P. engines, are temporarily out of print. The matter is one which it is hoped will be remedied very shortly.

Gloria Sidecars.

In future Gloria sidecars will be made suitable only for Triumph motor cycles, and will not be available to the general public for fitting to other makes of machines. The Gloria Cycle Co., Ltd., is a subsidiary company to the Triumph Cycle Co., Ltd., Coventry, to whom all communications respecting Gloria sidecars should be addressed.

Universoline.

We have lately received a sample of Universoline, a preparation for rendering joints gastight, sold by Messrs. Sterns, Ltd., Royal London House, Finsbury Square, London, E.C.2, and for facilitating the screwing and unscrewing of unions, nuts, or bolts. The formation of rust in the threads is obviated, and the articles can be unscrewed at any time, even if they have been exposed to water. We hope to report on its behaviour at a later date.

Well-deserved Promotion.

Mr. Arthur Wright, who has held a prominent position on the staff of the Triumph Cycle Co. for the last twenty-three years, was in 1914 appointed assistant secretary to the company. Recently he has had a further promotion, viz., to the position of secretary. Mr. Wright is well known to Midland cyclists and motorists, and has held the post of honorary treasurer of the Coventry and Warwickshire Motor Club for nearly ten years. He is an active motorist, and has ridden a motor cycle from the earliest days of the pastime.

Catalogues Received.

We are in receipt of a folder giving the latest information concerning the 1919 two-stroke Radco, made by Messrs. E. A. Radnall and Co., Vauxhall Works, Dartmouth Street, Birmingham.

The 1919 G.N. catalogue is to hand, and illustrates the Standard and Vitesse models, with a plan showing the details of the chassis. Very complete particulars of these cycle cars are given. G.N., Ltd., Etna Works, Albert Road, Hendon, N.W.4.

"The Metro-Tyler Two-stroke." The Tyler Apparatus Co., Ltd., Banister Road, Kilburn Lane, Kensal Rise, London, N.W. 10. The publication illustrates and describes the handy little lightweight, which we have previously described in these pages, both single and two-speed models. The company announces an advance of 7½% on the price of the single speed.

THE KING DICK BELT FASTENER.

A WELL-MADE belt fastener has lately been placed on the market by Abingdon-Ecco, Ltd., Tyseley, Birmingham, makers of the world-famed spanners which have so long been used by engineers in this country.

As may be expected, the new belt fastener is of thoroughly sound design and made of first-class material. It may be pointed out that the clamps are serrated on the inner sides so as to clip the belt ends firmly. Hardened steel bushes of hexagon form take the wear, and the fastener locks automatically and cannot work loose. It possesses the advantage of being capable of being opened or closed



King Dick fastener.

instantaneously, and there are no loose pieces to fall about when it is uncoupled.

The belt fastener is well finished and practically rust-proof. It is made suitable for ½in., ¾in., 1in., and 1½in. belts. It is, moreover, moderate in price.

STATE OF THE ROADS TO NORTH WALES.

MOTOR cyclists from London and the Midlands usually choose the route *via* Stonebridge, Chester Road (Erdington), and Brownhills. From Chester Road nearly all the way to Brownhills the road surface is very bad, the pot-holes are numerous and practically unavoidable, as they stretch from one side to the other. From Brownhills to St. George's (Wellington) and on to Shrewsbury and Llangollen the surface is good, but from the last place to Corwen and beyond there are a number of patches of loose stones.

From Bettws-y-Coed, *via* Llanrwst to Conway, the road is quite good. Those who want to follow the left bank of the river from Bettws should avoid the stretch between Bettws and Llanrwst (this section has been much cut up by timber haulage) by keeping to the right bank and crossing the river at Llanrwst Bridge. The left bank from Trefw to Conway is fairly good.

The bad stretches of road between London and the Midlands and North Wales can be avoided by travelling as follows: Stonebridge to Coleshill (excellent), Bassett's Pole, Wall, Muckley Corner, and along Watling Street *via* Weston-under-Lizard and Newport (Salop).

There is a bad stretch between Weston and the Shifnal-Newport road; after that the surface is excellent through Hinstock, Whitchurch, Wrexham, Mold, St. Asaph, to Conway. The roads through the camps at Whitchurch and Kinnel require care, but are not at all bad. From Abergele to Colwyn Bay and from Whitchurch to Chester the road is excellent.



Everyone wants Peace and MOTOR CYCLES.

The desire for an early peace is great—but the demand for immediate deliveries of motor cycles can best be described as frantic.

Everyone wants his machine at once, and Manufacturers and Agents are inundated with orders which it will take months to execute.

To advertise machines as being in stock is ironical, because they are snapped up long before the advertisement can appear—at least, that is Godfrey's experience.

To make definite promises of delivery is asking for trouble as, owing to causes entirely beyond their control, manufacturers are more often than not unable to keep their promises to the agents.

All we can say is that, as Sole Distributing Agents (London and Home Counties) for

A.B.C., BLACKBURNE, INDIAN and SCOTT Motor Cycles

we can give the most favourable deliveries of these models, and as large Contractors for all other well-known makes we are receiving a good share of the present limited supplies.

We are not refusing Orders, but we feel it is only right to frankly explain our position. Your order—if you decide to place one—will be executed in strict rotation and as early as possible, but we can make no definite promise as to delivery. Any machine available goes to the first name on the list at the fixed retail price, and no offer of a premium to secure priority is ever entertained by Godfreys.

We are keenly alive to the fact that upon the custom and goodwill of our numerous friends depend the success of our business. We have not the slightest wish to take up an independent attitude, and every desire to accept and execute any and every order; but it is not fair to the Customer, and not fair to ourselves to make promises which cannot be carried out.

Later on (in a very few months we hope), when machines are coming through regularly and in ever-increasing numbers, we shall be able to satisfy all our Customers. In the meantime, we can only express our regret—that the supply of machines is not equal to the present demand.

GODFREY'S LTD.,

208, Gt. Portland Street,
LONDON, W.1.

Phone: 7091 Mayfair (2 lines).



MISCELLANEOUS ADVERTISEMENTS.

PRICES.

ADVERTISEMENTS in these columns—First 12 words or less 2/6, and 2d. for every additional word. Each paragraph is charged separately. Name and address must be counted. Series discounts, conditions, and special terms to regular trade advertisers will be quoted on application.

Postal Orders and Cheques sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd.**, and crossed **Treasury Notes**, being untraceable if lost in transit, should not be sent as remittances.

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.4), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge, which must include the words Box 000, c/o "The Motor Cycle." Only the number will appear in the advertisement. All replies should be addressed No. 000, c/o "The Motor Cycle," 20, Tudor Street, E.C.4. Replies to Box Number advertisements containing remittances should be sent by registered post.

DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pays carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged; when under £10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

MOTOR CYCLES FOR SALE.

A.B.C.

A.B.C.—Earliest deliveries. Your name on our list ensures this.—Martin Mitchell, Ltd., Stafford. [7658]

A.B.C.—Sole agent for South Wilts; now booking orders for early deliveries.—Longman, Fisherton, Salisbury. [7742]

CROW Bros., High St., Guildford, have contracted largely for the new A.B.C. Order now for earliest delivery. [5298]

A.B.C.—We are now taking orders for the new A.B.C. twin; order now for early delivery.—P. Ellis and Co., 360, Little Rd., Fulham, S.W.6. [8460]

LIVERPOOL and District Agents for A.B.C. Place orders now to secure early delivery.—Victor Horsman, Ltd., 9, Parr St., Liverpool. [10003]

A.B.C.—Sole agents for these famous machines. Orders booked now for early delivery.—Chandler, Reyre, and Williams, Saco St., Hitchin. [0996]

JUNES' Garage.—We are in a position to accept orders for A.B.C. motor cycles; deposits optional; delivery April or May.—Broadway, Muswell Hill, N. [0991]

ISLE of Wight.—Witham Bros., Newport, I.W., are Island agents for A.B.C. machines. Full particulars on request. Orders being booked for earliest delivery. [7515]

DISAPPOINTED FOR EASTER ?

Make sure of delivery for

WHITSUNTIDE

ALL ORDERS ARE BEING SUPPLIED
STRICTLY IN ROTATION.

We invite your enquiries as to specifications and delivery dates of

A.B.C., P. & M., B.S.A., A.J.S. NORTON, ROVER, TRIUMPH, BLACKBURN, NEW RYDER, MATCHLESS ROYAL ENFIELD, CONNAUGHT, NEW IMPERIAL.

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For Modern
MOTOR CYCLES
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Telephone: Museum 557.

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London



MOTOR CYCLES FOR SALE. A.B.C.

A.B.C.—Distributors for Scotland. Book your order now to ensure reasonable date for delivery.—Edinburgh Pioneer Motors, Ltd., 50, Grindlay St., Edinburgh. [X8301]

WE Are Now Booking Orders for earliest deliveries of A.B.C. motor cycles. Secure an early delivery by placing your order with us now.—Dunwells' Garage, Wigan. Tel.: 328. [X3219]

A.B.C.—Book early and prevent disappointment. Specification and full particulars will be sent on application.—The Spalding Motor Co., Ltd., Spalding, distributing agents for Lincolnshire. [X6969]

DAN BRADBURY, 224, London Rd., Sheffield, sole A.B.C. distributing agent for Sheffield and district, will give you earliest possible delivery of the new A.B.C. motor cycles and light cars. [7270]

A.B.C.—Lieut. R. G. Parker, A.M.I.A.E., is now demobilised after 4½ years' service in the Army, and can give your enquiries his personal attention.—Earliest deliveries of A.B.C.'s from Parker and Sons, St. Ives, Hunts. [8898]

A.B.C.—Sole and wholesale and retail agents for Oxfordshire and part of Buckinghamshire. Early deliveries guaranteed. Enquiries re sub-agencies welcome.—The Layton Garages, London Rd., Bicester, or 90, High St., Oxford. A.B.C. enthusiasts. 'Phone: 35 Bicester. [8520]

Abingdon.

1914 3½ h.p. Abingdon K.D., 2 speeds, handle starter, coachbuilt sidecar.—Railway Garage, Staines. 'Phone: 139. [8772]

A.J.S.

JACK HEALY, Cork.—Official A.J.S. agent.—Garage and works, Drinnan St. [X8356]

CROW Bros., Guildford.—A.J.S. Agents since 1912. Write us for your requirements. [9777]

A.J.S. Combinations.—District agents, Hilton, Sharp and Co., Ltd., Foxhall Rd., Blackpool. [X7105]

A.J.S. Combination.—Book your order now for earliest delivery.—Parker's, Bradshawgate, Bolton. [X9102]

1919 A.J.S. Combinations.—Write Merick's Store, 174, Listerhills Rd., Bradford. 'Phone: 2439. [X2439]

A.J.S. 1917 (registered) 6 h.p. Combination, 3-speed, lamps, horn, tools, condition perfect; £120.—14, Nott Square, Carmarthen. [X8735]

A.J.S.—For quick deliveries try the sole Leicester-shire agent, Will Chapman, 113, Belgrave Rd., Leicester, the first appointed A.J.S. agent [13531]

A.J.S. 1917, 2½ h.p., 3-speed, countershaft, hand clutch, k.s., as new, lamps, etc.; 66 gns.—92, Beulah Rd., Thornton Heath, Croydon. [8493]

1918 A.J.S. 6 h.p. Combination Machine, new 1919, with lamps, ridden very little; bargain. £138/10.—Abson, 49, Kirkgate, Wakefield. [X9065]

A.J.S. 1915 Combination, 3-speed, clutch, speedometer, now being overhauled by makers; 85 gns.; privately owned.—1, Filmer House, Filmer Rd., Fulham. [87735]

A.J.S.—Exeter Motor Cycle and Light Car Co., Ltd., Bath Rd., Exeter, and 28, Tavistock Rd., Plymouth. Sole agents. Now looking for earliest deliveries. [0007]

A.J.S. 6 h.p. Combination, detachable wheels, hood, screen, lamps, spring seat-pillar and pillion seat; £125.—35, Manby Grove, Stratford. Apply any time before 11 a.m. [8332]

4 h.p. A.J.S. Combination, spare wheel, wind screen, horn, speedometer, all lamps, horn, etc.; best offer over £100 secures.—Letters only, Stud Farm, East Acton Lane, Acton, W. [8609]

A.J.S.—For the earliest possible deliveries of 1919 models, specifications, and super service, try the A.J.S. Specialists, The Walsall Garage, Wolverhampton St., Walsall. 'Phone: 444. [4668]

A.J.S. 6 h.p., 1914, stored part war, Dunlop 700x80 car tyres, sidecar de luxe, paint, etc., as new, owner-driven, not the average worn second-hand outfit; trial; £110.—Revs, The Crescent, Belmont, Sutton. [18600]

1915 6 h.p. A.J.S. and Sporting Sidecar, 4-point attachment, interchangeable disc wheels, lamp, speedometer, etc., in perfect condition, low mileage, now being overhauled and entirely re-enamelled, ready second week in May; seen Tunbridge Wells; £120.—Nott-Bower, Mayfield, Sussex. [X8832]

A.J.S. 1914 6 h.p. Combination, first-class condition, just overhauled and re-enamelled, new chain, mechanical horn, mirror, speedometer with trip, 3 lamps, 3 generators, coachbuilt sidecar, just reupholstered, sprung wheel, hood with side curtains, apron, screen with detachable wings, luggage carrier, motor pointing, petrol and oil carriers, disc wheels, tyres good, new Palmer on back wheel; £120; seen mornings of appointment.—Davenport, Sandown House, Esher. [X9175]

A.J.S. Spares, prompt delivery.—Cyril Williams, Chapel Ash Depot, Wolverhampton. Tel.: 19189. [19189]

MOTOR CYCLES FOR SALE.

A.J.S.

A.J.S., 1914-15. 2½ h.p., countershaft, 2 speeds, handle-bar clutch, new tyres and re-enamelled, all-enclosed chain drive, kick starter, detachable wheel, stored 3 years; £60.—After 5 p.m., Heath End Cottage, Hale, near Aldershot. [8559]

Alldays.

3½ h.p. Alldays Matchless, T.T., long exhaust, lamps, 32 Philipson pulley; £45.—53, Pelham St., S. Kensington. [8744]

ALLDAYS 8 h.p. Combination, 1916, M.A.G. engine, 3 speeds, very fine turnout; 95 gns., or nearest offer.—5, Thornton Place, Baker St., W.1. [8677]

ALLON 2-stroke, 2-speed gear, with hand-operated clutch, kick starter; book your order now for earliest delivery.—Parker's, Bradshawgate, Bolton. [X9107]

ALLDAYS Matchless, 2½ h.p. 2-stroke Villiers engine, Sturmy-Archer 3-speed gear, Bosch mag., good condition; £35.—Cooper, 13, Richmond Rd., Ipswich. [8404]

A.L.P.

A.L.P. Lightweight 2 h.p., 1914, new Goodyear built tyre and Pedley belt, just been overhauled, spare belt, etc., splendid condition; £20; seen by appointment.—Bensley, 23, Kingsbury Rd., Neasden, N.W.10. [X8941]

Ariel.

CROW Bros., High St., Guildford, Ariel agents since 1913, have 1919 models in stock. [5299]

3½ h.p. Ariel Combination, 3 speeds, clutch, kick, 29 lamps, etc., tyres excellent; £80.—Anderson, 29, Peel St., Lincoln. [X9132]

ARIEL, 3½ h.p. and 6-7 h.p.; early deliveries.—F. Speakman, Ariel Expert, 7, Rochdale Rd. Harpurhey, Manchester. [5269]

ARIEL Conchbuilt Combination, 3½ h.p., variable gear, lamps, semi T.T. bars, mechanical horn, splendid condition, one new tyre, 2 others good; £40.—Apply Friday 3-4, 30, Cleveland Mansions, Elgin Av., W.9. [8402]

ARIEL 1912 3½ h.p., variable gear, decompressor, B. and B. carburettor, speedometer, lamp, horn, new spare belt, tyres and machine in splendid condition; £30; appointment.—G. Honey, 61, Oxberry Av., Fulham, S.W. [8395]

ARIEL—Lieut. R. G. Parker, A.M.I.A.E., is now demobilised after 4½ years' service in the Army, and can give you enquiries his personal attention. Earliest deliveries of Ariels from Parker and Son, St. Ives, Hunts. [8899]

Auto-Wheels

AUTO-WHEEL, little used, perfect; £9/15.—Box L768, c/o The Motor Cycle. [8584]

AUTO-WHEEL, good condition; £7/10.—Apply, 5, Edwin St., Boston, Lincs. (D) [X9037]

AUTO-WHEEL, Model de Luxe, excellent condition; £12.—233, Felsbam Rd., Putney. [8758]

1915 Antowheel de Luxe, new condition, only done 1,400; £15.—Box 3,319, c/o The Motor Cycle. [X8710]

AUTO Wheel, perfect condition; £10, carriage paid Trimble, Cheriton, Fitzpaine, Crediton, Devon. [X8729]

AUTO-WHEEL, perfect, ready to ride; £10.—Hall, next Green Mao Hotel, High Rd., Whetstone, Middlesex. [8385]

AUTO-WHEEL, fitted to gentleman's 3-speed cycle, both in good running order; £17/10 or offer.—E. Jervis, 23, Milton Rd., Bourne, Lincs. [8814]

AUTO-WHEEL (Wall); £10; splendid condition, fittings included; fetch bike and ride away.—George, 13, Model Cottages, East Sheen, S.W. [8495]

WALL Auto-Wheel, nearly new, good hill climber, attached Rudge-Whitworth 2-speed bicycle; seen any time; bargain, £14, no offers.—Locke, 9, Riverdale Rd., Erith. [X9098]

WALL Auto-Wheel, just thoroughly overhauled, attached to gent's bicycle, all in perfect order, tyres practically new, a fine outfit; £16 net.—168, Risley Av., Bruce Grove, London. [8538]

AUTO-WHEEL, B.S.A., 1914, numerous spares, attached gent's New Hudson 3-speed cycle, both excellent condition; £16/10, or separate, £15, Balfour Grove, Oakleigh Rd., Whetstone, N.20. [8422]

WALL (B.S.A.) Auto-Wheel de Luxe (No. 43727) with special all-black B.S.A. bicycle (No. 14439), spring forks, spring saddle, oil bath, carrier, Lucas lamp and bell, tools and fittings, the whole in beautiful condition; cost £23/10/3 (receipt shown) pre-war; price £25, or exchange for 2½ h.p. lightweight; stamp for reply to enquiry.—Keen, Broad St., Leominster. [8455]

Bat.

5-h.p. Bat, B. and B., Bosch, £30; tornado under-slung sidecar, £18.—29, Thornhill Rd., Lewton, E.10. [8707]

8 h.p. Bat-Jap, Roc gear, grand coachbuilt sidecar, good running order; £85.—Mann, 15, Amv St., Orpington, Kent. [X9199]

10 h.p. Bat-Jap and C.B. Canoelet Sidecar, 2-speed gear, new tyres; £45.—9, The Parade, Cambridgeshire, Newbury, Surrey. [8739]

BAT-J.A.P. Twin, 8 h.p., and sidecar, very powerful, and accessories; £48.—Apply, G. Godfrey, 7, Canal Rd., Mile End Rd., E. [8421]

TYRES

Special Clearance Lines.

All goods sent on seven days' approval against remittance.

A 3/- OUTFIT is presented Free of Charge to all purchasers of Covers and Tubes as advertised on orders exceeding £1.

COVERS.

BATES—

	Our Price.	List Price.
26×2½ special heavy	45/-	58/-

GOODYEAR—

26×2 heavy diamond studded.	28/6	Pre-
26×2½	41/6	War
28×3	81/-	Prices.
650×65	46/3	

FIRESTONE—

26×2½×2½ heavy non-skid	35/-	60/-
(Oversize for 2½ rims.)		
28×2½ ditto	37/-	65/-
(For Indian Machines.)		

LEYLAND—

26×2½ extra heavy, 3-ribbed ...	37/6	57/6
26×2½	40/-	60/-
28×3	45/-	65/-
26×2½ (oversize for 28×3)	65/-	85/-

BEST MAKES—

Cannot advertise same.		
700×80 heavy ribbed	55/-	71/3
700×80 heavy rubber studded	50/-	71/3
(Oversize for 650×65 rims.)		

TUBES.

Bates, Goodyear, Firestone, etc.		
26×2 ... 6/-	8/9	28×3 ... 10/-
26×2½ ... 6/9	10/-	28×2½×2½ 8/-
26×2½ ... 7/-	11/-	650×65 ... 10/-
26×2½ ... 8/-	11/6	700×80 ... 13/6
28×2½ ... 8/6	12/6	

BELTS.

All makes in Stock at special prices.
Best English make 6ft lengths by rin. 1/3 per ft.
5ft. lengths by rin. 1/4 per ft.
We can supply odd lengths to make up two-piece belts, to any required lengths.

RETREADING.

Extra heavy rubber studded	17/5
Heavy rubber studded	15/-
Medium rubber studded	12/5
Time required, 7 days from receipt of cover.	



264 Vauxhall Bridge Road, S.W.
266 Victoria, 1.

MOTOR CYCLES FOR SALE.

Bat.

BAT Combination, mag., tyres as new, good sidecar running order, good condition; £30.—34, Millgrove St., Battersea, S.W.11. [8599]

4 h.p. Bat, Kilecom engine, Bosch, B. and B., good tyres, ride away; £19; call evenings.—Barnes, 83, Trinity Rd., Tooting, S.W. [8392]

1912 4 h.p. Bat-Jap, fixed engine, reholed, new piston and bushes, excellent condition; will accept £25.—Fitt, St. James St., King's Lynn. [X8946]

Blackburne.

CROW Bros., High St., Guildford, are old Blackburne agents, and can give early deliveries. [5300]

BLACKBURN.—Sole agents. Book now for early delivery.—Chandler, Reyre and Williams, Sun St., Hitchin. [10999]

JONES' Garage.—We can accept orders for all models of Blackburne motor cycles; delivery expected in April; deposits optional.—Broadway, Muswell Hill. [10992]

BLACKBURN.—For earliest possible delivery consult the Oxfordshire sole agents.—The Layton Garages, London Rd., Bicester, or 90, High St., Oxford. Phone: 35 Bicester. [8518]

Blumfield

BLUMFIELD 1914 5-h.p. Twin, 3-speed, countershaft, B. and B. pilot jet carburettor, lamps, speedometer, Stewart's signal, Dunlop steel stud (700×80) fitted new this week on rear, luxurious coach-built sidecar with locker, unused 2 years, guaranteed take 3 adults anywhere; will drive purchaser any reasonable distance home; best over £75.—Smith, 82, Francis St., Birmingham. [X9084]

Bradbury.

4 h.p. Bradbury, free engine, clutch; £25.—9, The Parade, Cambridge Rd., Norbiton, Surrey. [8740]

BRADBURY, 1912, adjustable pulley, lamps, etc., good running order; £30.—Slade, 35, Victoria St., Westminster. [8802]

4 h.p. Bradbury, 3 speeds, clutch, combination, in perfect running order; £55.—F. Logsdail, London Rd., King's Lynn, Norfolk. [X8932]

BRADBURY.—For the earliest possible deliveries of 1919 models try the sole Manchester agent, Tora Davies, 229, Deansgate, Manchester. [6652]

4 h.p. Bradbury, 2-speed, F.E., Bosch, B. and B., new Dunlops and belt; £42, or near offer.—"Ailsa Craig," Rosedale Rd., Grays, Essex. [X8938]

BRADBURY, 4 h.p., 2-speed, free engine, and new coachbuilt sidecar; £50.—The Avon Motor Cycle Co., Southbridge Rd., South End, Croydon. [8906]

BRADBURY and Sidecar, 4 h.p., 2-speed, free engine, special Dunlops, Lucas lamps, mechanical horn, all first-class condition; any trial; £45.—46, Mill Hill Rd., Acton. [X9072]

BRADBURY, 4 h.p., 2-speed, clutch, horn, speedometer, lamps, good tyres, lin. belt (new), very powerful, inke sidecar easily; £42; any trial here; guaranteed sound.—28, Barge, Canterbury, Kent. [X8935]

Brough.

BROUGH 1916 3½ h.p. Combination, Canoelet sidecar; 85 gns.—Lindhurst, 4, Petherton Rd., Highbury, N. [8338]

BROUGH 3½ h.p. Twin, 3-speed, handle-bar control clutch, just overhauled, perfect condition, T.T. bars.—Johnson, The Firs, Kibworth, Leicester. [X9130]

BROUGH, twin engine, low, fast, T.T., in good running order on front brake; first cash £36, bargain, no offers.—E. Woods, 312, Deansgate, Macclesfield. [X8944]

BROUGH Late Model 3½ h.p. Twin, 2 speeds, absolutely as new, will do 80 m.p.h., just been thoroughly overhauled; £74.—Short, 485, Upper Richmond Rd., East Sheen. [8453]

BROUGH, Model HC, 1916, 3½ h.p., overhead valves, Sturmy-Archer 3-speed clutch, kick start, lamps, speedometer, painted dark grey, sunstet and fastest on the road; £95.—Phone: 888 Hammersmith. [8711]

Brown

6 h.p. Twin Brown Combination, 2 speeds, free engine, ready to ride away; real bargain; £56.—178, High St., Tooting. [8697]

B.S.A.

1916 3-speed 4½ h.p. B.S.A. and C.B. sidecar; £75.—H. Wright, Arlesey, Beds. [8442]

B.S.A., 1916, 3-speed countershaft; £70.—Short, 485, Upper Richmond Rd., East Sheen. [8453]

NEW B.S.A.'s in stock; immediate delivery Model K.—Alexander, Agent, Wallasey Village. [1506]

B.S.A. Combination, 1916, 3 speeds, nice lot; £75.—51, Maplethorpe Rd., Thornton Heath. [8791]

B.S.A., 4½ h.p., Model H, all chain drive, perfect condition; £70.—143, Peckham Rye, S.E. [X8840]

1913 B.S.A., 4½ h.p., 2-speed, free engine, kick start, little used, £48; 1916 J.H., 2½ h.p., 2-stroke, 2-speed, as new.—W. Owens, Buckley, near Chester. [X9118]

All letters relating to advertisements should quote the number at the end of each advertisement, and the date of the Issue. A43

MOTOR CYCLES FOR SALE.

B.S.A.

FOR Sale, 1916 B.S.A. 4½ h.p. combination, 3 speeds and clutch; £68, a bargain.—P. Deery, Strabane.

1913 B.S.A., clutch model, fast machine, good order throughout; £36.—Box 3,355, c/o The Motor Cycle. [X9028]

1915½ B.S.A. chain-cum-belt, new Dunlops, splendid condition; £65.—82, Stendale Rd., Hampton Smith. [X9190]

NEW B.S.A., all-chain model, and Montgomery sidecar, ready to ride away.—Foulkes, Shawbury, Salop. [X9080]

B.S.A., 1919 models, early deliveries.—Bastone's, 228, Pentonville Rd., King's Cross, London, N.1. Tel.: 2481 North. [8819]

B.S.A., 1914, Model H, C.B. combination; any examination and trial; £65.—R. A. Matthews, Culverden, Tower Rd., Worthing. [8712]

B.S.A., 3½ h.p., 2-speed, free engine, lamps, horn, etc., good condition; £35.—75, Cudworth Rd., St. Willesborough, Kent. [8696]

B.S.A., 4 h.p., 3-speed gear, chain-cum-belt drive, with coachbuilt sidecar, in sound condition; £80.—Brook Bros., Burnham, Somerset. [8556]

B.S.A. 4½ h.p., 1916, chain-cum-belt, Montgomery sidecar, £75; also B.S.A., 1911, fixed engine, £20.—Metcalfe, Manor Farm, Brighton, Sussex. [8427]

B.S.A. Combination, 1915 (late), little used, 4½ h.p., chain-cum-belt, 3-speed countershaft, all accessories; £95.—Beale, 3, Fosse Rd., Leicester. [X9154]

1914 B.S.A. Combination, 3-speed countershaft model, just cost £16 for complete renovation, privately owned; bargain, £80.—Box 3,354, c/o The Motor Cycle. [X9188]

1913 B.S.A., 2-speed model, tank and fittings renovated, fast and powerful, £43; open basket sidecar to sit, £3.—Brookes, 147, Station St. East, Coventry. [X9189]

1919 B.S.A. Motor Cycle, all chain, only ridden a few miles, unscratched, with Lucas lamp and horn; what offers.—T. W. Gore, Windingwood, Kintbury, Berks. [8805]

B.S.A.—For the earliest possible deliveries of 1919 models, specifications, and prices, sole district agents, The Walsall Garage, Wolverhampton St., Walsall. Phone 444. [4668]

B.S.A. Sole district agents.—For earliest possible delivery and best service, try The Layton Garages, London Rd., Bicester. B.S.A. Specialists. Phone: 35 Bicester. [8519]

B.S.A., 3-speed, with torpedo coachbuilt sidecar, machine delivered March, 1919, mileage 570, Stewart speedometer, Lucas horn, lamps, sporty and perfect; £105.—77, Evesham St., Redditch. [8743]

B.S.A.—Lient, R. G. Parker, A.M.I.A.E., is now demobilised after 4½ years' service in the Army, and can give your enquiries his personal attention.—Earliest deliveries of B.S.A.'s from Parker and Son, St. Ives, Hunts. [8900]

B.S.A. Combination, 1917 4½ h.p., 3-speed countershaft, chain drive, clutch, kick starter, 2 lamps, generators, speedometer, mechanical horn, tools, done 1,700 miles careful driving, perfect condition; £100.—C. May, Tonbridge, Kent. [8379]

1915 B.S.A. Coachbuilt Combination, chain-cum-belt, kick starter, 3-speed countershaft gear, electric lighting and horn, also mechanical horn, speedometer, watch, pillion seat, luggage grid, and tools, spares, etc.; at 80 gns.—Trench, Bangor, Tel.: 86. [8375]

FOR Sale, 1919 B.S.A. combination, all-chain, new this January, electric lighting and horn, screen, luggage grid, and full accessories, spares, tools, etc., run between 400 and 500 miles; owner getting larger power; price £120.—Apply, Box L786, c/o The Motor Cycle. [8896]

B.S.A. Combination, 4½ h.p. chain-cum-belt, 1915-16, countershaft, 3-speed clutch, kick start, 700×80 tyres, all-round artillery wheels, Lucas head and rear lamps, a real good reliable outfit; £90; no offers.—Healey, 174, Mansel Rd., Small Heath, Birmingham. [X9054]

B.S.A.—The Birmingham City agents and specialists who confine their business absolutely to B.S.A. manufactures always holds the most complete stock of motor cycles, sidecars, bicycles, etc., and can give immediate delivery of all replacements.—The Conaty Cycle and Motor Co., 307-8, Broad St. Phone: Midland 733. [7250]

Burford.

BURFORD, 1914, 3½ h.p., 3-speed, sporting wicker sidecar, good condition, kick; £50.—8, Hampstead Hill Gardens, N.W.3. [8509]

Calcott.

CALCOTT 2½ h.p., 1914, variable pulley, Bosch, new tyres, stored, just overhauled, splendid condition; 29 gns.—14, Sydenham Hill, S.E. [8835]

Calthorpe.

C. BERRY'S.—2½ h.p. 2-speed Calthorpe; bargain, £36.—125, Canal Rd., Mile End, E. [8850]

CALTHORPE-J.A.P., 2½ h.p., Enfield 2-speed, clutch, free engine, good order, condition, ready ride away; 36 gns.—Harrington Rd., Newwood Junction. [8435]

EASTERN GARAGE

IF YOU REQUIRE

Early Delivery

it is essential to

Order Now

We have placed contracts for all the most desirable motor cycles, and, for the guidance of intending purchasers, we state below the position regarding deliveries of each make. Enquiries will receive immediate attention, and we shall be pleased to send Catalogues giving current prices.

ALLON, 2-stroke; delivery May.

A.B.C., 3 h.p.; delivery June.

ARIEL, 3½ h.p.; delivery commenced.

ARIEL, 6 h.p.; delivery 7 days.

BLACKBURN, 2½ h.p.; delivery June.

BLACKBURN, 4 h.p.; delivery May (early).

BLACKBURN, 8 h.p.; delivery May (late).

BROUGH, 3½ h.p.; delivery May.

B.S.A., 4½ h.p.; delivery commenced.

CALTHORPE-J.A.P.; delivery 7 days.

CALTHORPE, 2-stroke; delivery 14 days.

CLYNO, 2-stroke; delivery 2 weeks.

CLYNO, 8 h.p.; delivery June.

DIAMOND, 2½ h.p.; delivery 7 days.

DOUGLAS, 1919 models; delivery June.

HENDERSON, 8-10 h.p.; delivery indefinite.

JAMES, 2-stroke; delivery May.

JAMES, 4½ h.p.; delivery 14 days.

JAMES, 6 h.p.; delivery 14 days.

MATCHLESS, 8 h.p.; delivery suspended.

METRO-TYLER, 2-stroke; delivery 7 days.

NEW IMPERIAL, 2½ h.p.; delivery 14 days.

NEW IMPERIAL, 8 h.p.; delivery commenced.

NORTON, 3½ h.p.; delivery May.

NORTON, 4 h.p.; delivery May.

N.U.T., 3½ h.p.; delivery May.

OMEGA, 2½ h.p.; delivery May.

ROVER, 3½ h.p.; delivery May.

ROVER, 6 h.p.; delivery May.

ROYAL ENFIELD, 2½ h.p.; delivery commenced.

ROYAL ENFIELD, 3 h.p.; delivery commenced.

ROYAL ENFIELD, 6 h.p.; delivery commenced.

SUN, 3 h.p.; delivery May.

TRIUMPH, 2½ h.p.; delivery commenced.

TRIUMPH, 4 h.p.; delivery commenced.

ZENITH, 5 h.p., twin; delivery commenced.

ZENITH, 6 h.p., twin; delivery indefinite.

SIDECARS.

CANOELET; delivery 14 days.

EMPIRE; delivery 7 days.

GLORIA; delivery 4 weeks.

MILLFORD; delivery April.

SWAN; delivery 7 days.

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MOTOR CYCLES FOR SALE.

Calthorpe.

CALTHORPE 2-stroke, brand new, with tools and pump; 36 gns.—Clayton, Garage, Hermitage Lane, Childs Hill, N.W. [8652]

1915 Calthorpe-Jap, 2½ h.p., Enfield 2-speed, stored since 1916, excellent condition; 36 gns.—39, Upton Rd., Dalston. [8722]

1916 Calthorpe-Jap 2½ h.p., 2-speed, splendid condition, all accessories, ride away; after 7; 40 gns.—8, Crowland Terrace, Essex Rd., N.1. [8577]

GUMMERSON, 5, John's Place, Acton.—2 h.p. Calthorpe-Precision, thoroughly overhauled, replated, and re-enamelled, a perfect lightweight; £30. [8706]

1915 Calthorpe-Jap, 2½ h.p., Enfield 2-speed, Lucas lamp and horn, stored 18 months, equal to new; 34 gns.—C. Lewis, The Haven, Dilwyn, Herefordshire. [8534]

CALTHORPE-J.A.P., 2½ h.p., good condition, spring forks, acetylene lamps, Enfield 2-speed gear; £35; inspection invited.—Statia, 70, Parliament Hill, Hampstead, N.W.3. [8399]

CALTHORPE-J.A.P., 1915½, 2½ h.p., Enfield 2-speed, Scanspray, X'All, thoroughly overhauled, stored 18 months, looks like new; £35.—Dunkley, 206, Cavendish Rd., Balham. [8561]

CALTHORPE Combination, 4 to 5 h.p. J.A.P., late 1916, mechanically perfect, Enfield gear, handle starter, fitted auxiliary tank, spares; £70.—Catherham, Hamsted Rd., Southend-on-Sea. [8537]

Campion.

1917 Campion, 2½ h.p., new condition; £40.—Reeves, Guildford Rd., Farnborough, Hants. [8620]

Centaur.

CENTAUR Lightweight, new condition; £28.—H.S., 33, St. Stephen's Rd., Bow, E. [8659]

CENTAUR and Coach Sidecar, 3½ h.p., new tyres, free engine, 2 speeds; any trial; £45.—Godwin, 7, Conal Rd., Mile End Rd., E. [8625]

1914 Centaur Combination, 2-speed, clutch, handle start, lamps, horn, splendid condition; £65.—Address, 53, Hawk's Rd., Kingston-on-Thames. [8800]

Chater-Lea.

1916 Chater-Lea Combination, 8 h.p., lamp, tools, screen and hood, as new; £140.—7, Moyers Rd., Leyton. [8716]

CHATER-LEA 6 h.p. Twin, good condition, fast; £30.—After 5.30, Francis, 56, Smart's Lane, Loughton, Essex. [X9092]

CHATER-LEA, 3½ h.p., adjustable pulley, good condition, just been overhauled; £25.—Plumstead Vicarage, Woolwich. [X8805]

CHATER-LEA 8 h.p. Combination, 1914 model, 3-speed, chain drive, 700×80 car tyres, Searle non-hurstable tube in rear wheel, handsome coachbuilt sidecar, takes 3 anywhere; any trial; £85.—Portland Lodge, Lyme Regis. [8543]

1914 8 h.p. Chater-Lea Coachbuilt Combination, just overhauled, re-enamelled and plated, 3 in. tyres, 1 new Palmer cord and tube, new Amac carburettor, K.L.G. plugs, 3 electric lamps and battery, screen, horn, mirror, pump, and tools, looks like new; first offer over £100 secures.—Wilson, 116, Springbank Rd., Ilfith Green, S.E. [8873]

Chater-Jap.

CHATER-J.A.P. 8 h.p. Racer and Coachbuilt Sidecar, overhead valves; £65.—The Avon Motor Cycle Co., Southbridge Rd., South End, Croydon. [8908]

5-6 h.p. Chater-Jap, T.T., spring frame, 2-speed, Bosch, Binks, fast, powerful, £48; also torpedo sidecar, £4; offers.—273, High St. North, East Ham. [8875]

Chater-Peugeot.

CHATER-PEUGEOT, 6-6 h.p. twin, Bosch, Son-spray, coach sidecar, new Rock 2-speed, handle start, good condition, lamps, horn, trial, tyres good, drip feed; £55.—4, Park St., Berkhamstead. [X9046]

Clyno.

CLYNO.—Earliest deliveries.—Your name on our list ensures this.—Martin Mitchell, Ltd., Stafford. [7659]

CROW Bros., High St., Guildford, West Surrey agents for the 1919 Clyno. Order now to ensure early delivery. [1653]

6 h.p. Clyno, 1912, in splendid condition, engine just overhauled; £35.—Oswell, Cross Keys, Hadley, Salop. [X8994]

5-6 h.p. Clyno and cane sidecar, 1914, excellent condition; £55. Seen any time.—Borden Vicarage, Sittingbourne. [X8712]

GROVER, Smith and Willis, Basingstoke.—Agents for Clyno combination. Don't wait until the fine weather comes before placing your order. [6263]

CLYNO Late 1914 Combination 5-6 h.p. Twin, 3-speed countershaft gear, spare wheel, excellent condition; price £95.—Apply, Hemming, 37, Scrutton St., Finsbury, E.C. [X9128]

CLYNO.—Lient, R. G. Parker, A.M.I.A.E., is now demobilised after 4½ years' service in the Army, and can give your enquiries his personal attention.—Earliest deliveries of Clynos from Parker and Son, St. Ives, Hunts. [8901]



Advertising and Publishing Offices:

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Telephone: 2848 City (five lines).

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PARIS—Smith's English Library, 248 Rue Rivoli.

Motor Cyclists and the Budget.

MOTORISTS in general spent a somewhat anxious time in awaiting the Budget, but their patience has been well rewarded. In a few days' time petrol licences will be abolished, and the Petrol Control Department will be but a bad dream of the past. It has been officially announced that all petrol licences will be withdrawn on Saturday, May 17th, but we hear that it is doubtful if they will be issued after Saturday next. With the licences the sixpence super-tax goes by the board, so petrol will be that much cheaper for the motor cyclist. Furthermore, it was recently stated in public by a well-known petrol magnate that there was so much of this fuel in the country that it was difficult to know where to place the fresh cargoes arriving, and that so soon as the Government control of the fuel ceased it was bound to come down in price. It seems, therefore, that after the long years of weary waiting and privation a happier time is in store for us all. Readers are reminded that they may return their licence books to the Petrol Control Department, 19, Berkeley Street, London, W.1, and obtain a refund of the tax on every gallon of petrol which has not been purchased. The earlier the licences are sent back the earlier will the money be refunded, as thousands of licences will have to be dealt with.

It is pleasing to note that the Government promise that the petrol super-tax was to be purely a war measure has been kept, but we cannot help feeling that the tax should have been removed several months ago, as the charge on motorists has been heavy, and the cost of collecting it has been enormous. No fewer than 300 persons were employed by the Department. The official announcement that there is to be no tax on our home-produced fuel, benzole, of which 100,000 tons are being manufactured per annum, is good news. The Chancellor of the Exchequer also declared that the luxury tax would be abandoned. All this makes good reading, and what with

cheaper fuel, and the dropping of the luxury tax, which would certainly have been levied on the more expensive motor cycles, we indeed feel we have been spared to enjoy happier times. Mr. Chamberlain also pointed out that there might be some further taxation on motor cars, but that the matter would be given consideration and would be postponed till the next Budget. Before that time it is to be hoped that the Auto Cycle Union and the other motoring organisations will have carefully put the case of motor cyclists before the Chancellor. The motor cyclist is taxed quite severely enough already, and it is obviously unfair to place an extra burden either on the private owner or on the trade. It is, moreover, essential to point out, as we have previously done at considerable length, and on many occasions, that the Treasury formula is not justly applicable to motor cycles. Sufficient unto the day is the evil thereof, but we must be prepared.

The Future of the Motor Cycle.

IN this issue we make reference to the circulation of this journal, and we think that the majority of our readers will recognise the portent of the record attained by *The Motor Cycle* in automobile journalism. Our natural pride in the achievement is not mere self-satisfaction; in this unprecedented demand for *The Motor Cycle* we see ahead a time of exceptional prosperity for the industry and a motor cyclist community expanded even beyond enthusiasts' anticipations. Nothing succeeds like success, and every new motor cyclist joining the fraternity probably is the means of inducing at least one other to become an owner—and so the demand for the most economical motor vehicle goes on increasing. Motor cycles are becoming really popular with the general public: old prejudices have gradually been lived down. For utilitarian purposes, also, the motor cycle is now appreciated at its full value, and altogether the promise of the future is brighter than ever before.

Occasional Comments

by "Ixion"



Woolly Engines.

SO far as I know, nobody has ever tested public opinion on the question of whether the public prefers a woolly or a hotstuff engine. Of course, the books of various companies which have coquetted with both types must tell a tale to a careful student; and we could all mention names and years to identify certain models in which a rational compression ratio was incautiously exceeded. If this paragraph should provoke any correspondence, the letters will probably be unreliable as a guide, for the men who are keen enough to write letters to us are generally bitten with the speed mania. I rather fancy that 75% of us would vote for an engine which is easy to start, reluctant to conk, and does not require much humouring on its controls. Now, my impression is that quite a lot of British makers neglect these aspects of driving pleasure, whereas the Yankee designer values them more shrewdly. Unless American track timing is a farce, nobody can put up better racing stunts than the Yank—at any rate, with the 7 h.p. machine, which is his pet speciality. But he regards the track type of engine as the “pidgin” of the advertising department; and he re-designs that engine before he sends out roadsters to his agents. In England some at least of our manufacturers run short of self-restraint at this point. They turn out a stunt ’bus for competition work, and their road model comes too near being its twin brother. One result is that we produce the most efficient small machines in the world; another, to my thinking, is that we oppress fat, elderly riders with engines which are not woolly enough to suit them. Of course, the ideal is a stunt ’bus which can be woolly on the road; and I rather fancy one or two post-war machines may realise this ideal. But before the war I estimate that some of our firms were not in sufficiently close sympathy with the average buyer; let them visualise the “John Citizen” of “Poy’s” cartoons in the *Evening News*, and they will get the kind of man I mean. He buys seven motor cycles out of every ten sold in this country; and he is scared to death by an engine which revolves eight times backwards if it pulls up against a compression when he is trying to start it.

Automatic Carburetters.

FOR similar reasons I am rather surprised that manufacturers first of all fit the two-lever carburetter almost exclusively, and, secondly, adjust it to close far enough to stop the engine. I have not the very slightest doubt that the “John Citizen” type of user prefers an automatic carburetter, even if he thereby incurs a trivial addition to his fuel bill. I am well aware that shutting the throttle is technically the best method of stopping our engines. Driving on the valve lifter is not good practice, switching on and off is equally bad, and declutching is deprecated because the average motor cycle engine is imperfectly balanced and imperfectly silenced. Nevertheless, a

duffer will find control very considerably simplified if he is relieved of the air lever, and is prevented from accidentally stopping his engine by shutting his throttle too far. Now that the A.I.D. have developed an “absolute” system of carburetter tuning by using the flowmeter to gauge jets, automatic carburetters can be correctly set at the works without any expenditure on skilled testing.

Another Fallacy Gone?

IT will be interesting to see whether the flowmeter reduces the range of the old lottery about engines. It used to be believed that the track, Brooklands, and Six Day trade machines were fitted with engines which were selected from output by dint of their making a specially brilliant show in the firm’s routine tests; and that, outside these “star” engines, considerable variation existed, so that a lucky customer received a ’bus which was 5 m.p.h. faster than the one delivered to his next-door neighbour. I heard a knot of enthusiasts discussing the matter the other day, and their conclusion was that the carburetter was always responsible for such differences, that gauging jets by the drill used in manufacture accounted for carburetter vagaries, and that flowmeter testing would reduce these 20,000 outputs we hear of to a uniform efficiency.

These doughty warriors were arguing from the A.I.D. tests of aero engines, in which experience shows that uncommonly level results are usually obtained from aero engines. Factories turning out one hundred engines a week found remarkably little difference in the exactly recorded test results. I should be the last to deny that the carburetter had a lot to do with pre-war variations in motor cycle engines of the same make. Our engines are as sensitive to their carburation as their riders are to the functioning of their livers or the amount of liquor on board at any given moment. I have wasted innumerable hours retuning standard carburetters and fitting experimental vaporisers; as a rule, a new tuning or a different instrument will alter the behaviour of an engine most perceptibly. I always used to blame factory testers for the ease with which factory settings could be bettered; to-day I admit that the absence of an accurate system of gauging jets at the carburetter’s place of origin was the prime factor.

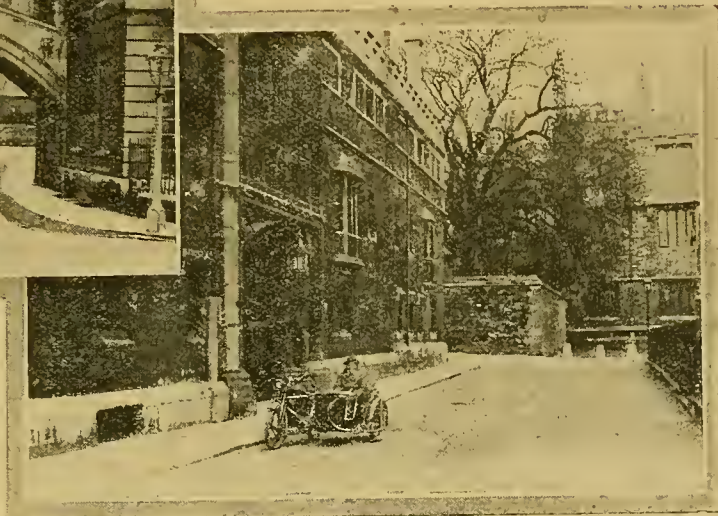
Nevertheless, the “star” engine will still pop up in every batch proceeding through some factories; and in others it will never appear at all. For example, some factories still use hundredth inch gauges, and “run the engine in” after assembly, warning credulous customers not to drive the ’bus all out for the first five hundred miles or so. Other factories employ scientific methods of manufacture, and experience no call to “wear their engines in.” They will lightly take a brand new engine down to Brooklands, and guarantee it to lap at over sixty on its third circuit. In other words, you get the “star” engine once in



SCENES IN A FAMOUS 'VARSITY CITY.

(Left) A Matchless outfit in New College Lane Oxford.

(Right) By Brasenose College. It was in this neighbourhood that the meetings of the notorious "Hell Fire Club" used to take place.



every 500 or 1,000, where workmanship is poor, and gauges are sloppy; but it is not really a star engine at all—it is rather the normal which all the other engines could and should reach in a decently run works. In a better class factory, *all* the engines will be stars. One maker said to me recently, "I was always *afraid* you'd buy one of our pre-war machines from an agent—I may as well confess that our standard 1914 engine wasn't any great shakes. Now we've had four years on aero work, and I *hope* you'll buy one selected at random from any agent's stock.

Obturator Rings.

THE letter under the above title in our issue of April 24th might impart a wholly false impression to any readers who regard obturator rings as one of the "hush-hush" secrets of the war. They were long ago eliminated from all aircraft engines in the British service, with the single exception of a small "school" engine, even the later rotaries being innocent of them. It is common knowledge that one or two inventors are exceptionally busy patenting novel applications of the idea just now, but it is by no means certain that they are sure of a renewed lease of life.

Sociability.

DURING a recent week-end I sampled the Portsmouth Road, and was principally impressed by the enormous number of sidecars, and the size of the loads which the combinations carried. Sidecars seemed to be perceptibly more numerous than solo machines, whilst many of the latter had flappers on their brackets. Evidently the unsociability of the solo machine is its worst enemy, and this is emphasised by the popularity of sidecars and pillions—the latter positively dangerous. At least one sidecar outfit in three carried an extra passenger on the carrier, and frequently two or three youngsters were stowed away in front of Mamma in the car. Ructions are not unknown in happy motor cycling homes as the quiver begins to fill. In more than one case, Mamma was in the saddle, Papa on the carrier, and the sidecar was wholly occupied by mixed olive branches. In these turnouts, Papa

looked either henpecked or debonair; in the former instance he was evidently relegated to the carrier for good—in the latter he wished to create the impression that *camaraderie* existed between him and his better half, and that they took tricks at the wheel; I hope they did. I returned to town in a meditative mood. When I marry, there will be no nonsense about a sidecar honeymoon; I shall buy my bride a lady's model Douglas; it is better so. By the way, I did not see a single machine *en panne*, despite overloading and the terrible road vibrations.

A Tinny Whirr in the Gear Box.

A CORRESPONDENT writes in some alarm because, although his gear box retains the usual three effective gears, it is prone to emit a "tinny whirr," and the noise continues although he has stuffed the casing as full of lubricant as it will hold. He dare not attempt to dismantle the box, and the one and only repairer within ten miles refuses to investigate the affair. I think there is no doubt that one of the ball races is loose in its housing; the outer race is a press fit in a housing in the aluminium casing, although this method of construction is not particularly good practice. All that is necessary is to take the gear box down and tin the outside of the ball race so that it will be a better fit in the housing. I do not think my correspondent need be afraid of the job, and I offer him two tips to assist in a more ambitious job than he has yet tackled. The first is to swill the gear box absolutely clean with paraffin before he starts so that he can see the parts and will not be baffled by afterwards discovering mysterious washers for which he can find no home, because they were embedded in lubricant when he took it down: the second is to write and ask the maker for a blueprint section of the box.

100,000 !

The Weekly Circulation of "The Motor Cycle" actually Exceeds 100,000 Copies, constituting a World's Record for Automobile Journals.

A Bright Outlook for the Future of the Pastime.



A 30,000 GATE. Imagine a crowd more than three times the size of the one shown above and some conception of our circulation figures will be gained.

STILL another record by the motor cycle, but this time not on Brooklands!

Our readers have rendered it possible for this journal to set up a new world's record in the circulation of motoring journals. Of course, *The Motor Cycle* has always led among motor cycling papers, but never has the figure of 100,000 been reached hitherto by any motoring periodical—car or motor cycle. The war merely delayed the achievement, for in 1914 our weekly issues reached the high figure of 93,000 copies.

It is sixteen years since No. 1 of this journal saw the light, the first issue being dated March 31st, 1903. For over six years it was the only paper devoted to the pastime, during which time *The Motor Cycle* piloted the movement through the most difficult period of its history. During this time our campaign for change-speed gears was launched, the magneto perfected, and the solution of motor cycle design successfully solved. The way was made clear for devotees to take up the motor cycle in their thousands.

Few readers can appreciate what 100,000 really represents. It is nearly as big as the British Army of old contemptibles which did so much to stem the Hun hordes in September, 1914.

Twenty tons of paper are consumed in the ordinary weekly circulation. Even the tiny wire used for stitching the pages together is used at the rate of nearly four miles per week.

Rotary printing machines (of which six are installed)—even more wonderful in design than our motor cycles—are used to print the journal. They are designed to reel off sixty-four page sheets at the rate of 6,000 copies per hour, counting, folding, and stacking them ready for collating and binding.

One Hundred Thousand Readers!

Imagine all of them mounted on motor cycles riding in single file. With a gap of only 5ft., they would form a procession over 220 miles in length.

If entered for an A.C.U. Trial and despatched at minute intervals, the competitors themselves would be strung out over 33,000 miles, or a distance equal to one and a third times round the world, and the officials with the starting watch would be busy for ten weeks without a break!

Again calculate the combined annual mileage of this number of motor cyclists each using two gallons of petrol per week. At an average of 75 m.p.g. the fuel used (over ten million gallons) would give 780 million miles of riding, or a distance more than equal to four double journeys between the earth and the sun, or over 31,000 journeys round the world.

1,250 Miles of Paper.

So much for one hundred thousand readers. Further figures directly connected with the production of one hundred thousand copies of *The Motor Cycle* are just as interesting. We find a normal week's issue stacked one above the other would form eight pillars as high as Niagara Falls, while the paper (exclusive of the cover) used in the recent Spring Number would form a ribbon, the width of *The Motor Cycle* and printed on both sides, reaching from London to Petrograd, a distance of 1,250 miles. To cover this distance a motor cyclist would have to ride at 20 m.p.h. without a stop for over sixty hours. Three such issues would more than bridge the Atlantic twice. The familiar blue paper used for the cover alone would stretch for a distance of thirty-four miles.

Through all the trials and vicissitudes that the industry experienced in the momentous years 1905 to 1911, and later when the industry assumed its present importance, the bond which existed between our readers and this journal is rarely observable between public and newspaper. From its earliest days *The Motor Cycle* has been so much a part of the movement that it has long since been regarded as the hub of the motor cycle world. When war broke out the journal itself, so to

speak, joined the Army. It proved its national value by obtaining over 10,000 recruits with special knowledge, and later chronicled the doings of those who helped so materially to win the war. Written by motor cyclists for motor cyclists, *The Motor Cycle* has won appreciation all over the world by its policy of fostering the motor cycle movement and providing interesting, helpful, and educative articles for the thinking man. Here it may be remarked that there is no keener motorist on the road than a motor cyclist—he is veritably part and parcel of his fascinating machine. Popularity may be judged by demand. In this connection, it is interesting to observe the rapid and consistent rise in our circulation figures during the past three months:

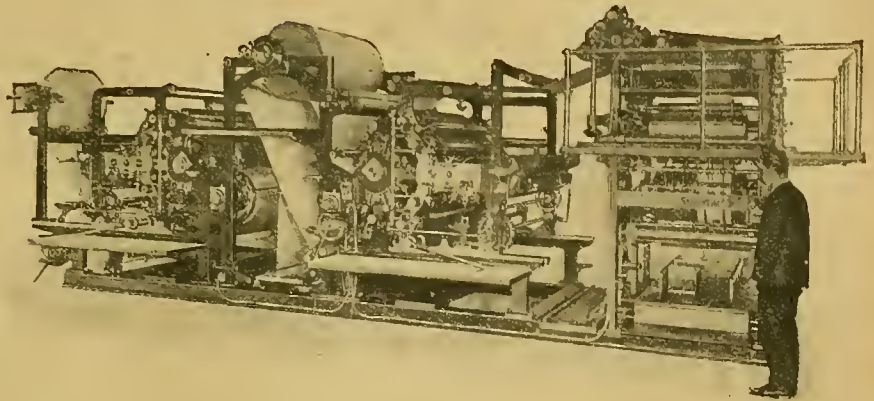
February 6th	...	67,253
February 13th	...	70,314
February 20th	...	72,881
February 27th	...	75,457
March 6th	...	80,301
March 13th	...	84,486
March 20th	...	89,433
March 27th	...	92,989
April 3rd	...	97,578
April 10th	...	98,643
April 17th	...	99,893
April 24th	...	100,935

A Record Demand for Motor Cycles—the Portent.

Quite apart from the perhaps justifiable pride we feel in the attainment of circulation figures of such magnitude, let us broadly consider its portent. One fact stands out prominently—the outlook for the pastime of motor cycling was never brighter. The interest in the sport and enthusiasm for the type of machines we all favour were never so pronounced. During the most prosperous period before the war the 100,000 mark was never reached, but in quick time since the Armistice that figure has been attained by *The Motor Cycle*, and the figures go on rising in a regular crescendo, as will be appreciated from an examination of the weekly totals published in this issue.

100,000!—

Manufacturers should take encouragement from the achievement. Already the conviction is growing in the motor car world that over-production is to occur when all the factories are in full swing next year. No such prospect is discussed in the motor cycle field, where the possibilities for the most economical form of motor vehicle are illimitable. Again, the British motor cycle possesses a reputation second to none Overseas, and were machines available many thousands could be shipped abroad immediately to fulfil long standing orders incapable of execution because the industry patriotically threw all peaceful production aside to assist in bringing about a successful termination of hostilities. Clearly the motor cycle industry is on the threshold of extraordinary developments, and the present demand for motor cycles, while abnormal when compared with pre-war standards, is bound to continue.



One of the large specially-built rotary printing machines upon which *The Motor Cycle* is produced. These machines are designed to print and fold a 64-page sheet at the rate of 6,000 copies per hour.

A New Automatic Carburetter.

A Three-jet Device with Single-lever Control to be known as the R.C.F.

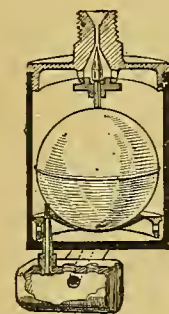
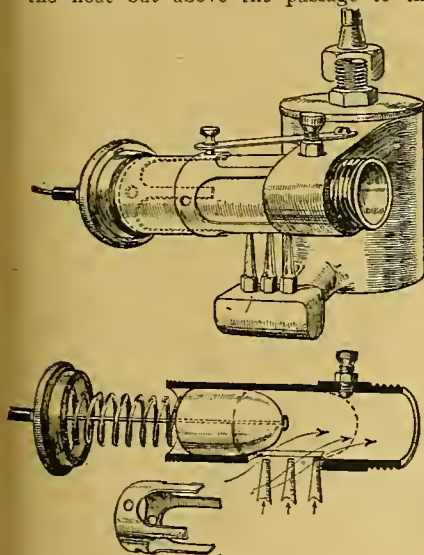
THERE is a growing demand for an automatic carburetter suitable for motor cycle use, and in the R.C.F. we have one of extreme simplicity embodying several novel points.

The float chamber contains a spherical float which fits the chamber loosely and thus rises and falls with the petrol, cutting off the supply by means of the usual needle valve at the proper level. Below the float but above the passage to the

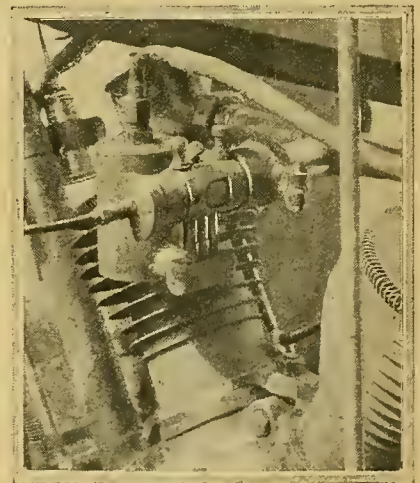
jets is a fine gauze filter, hemispherical in shape, extending over the whole base of the float chamber.

Two bosses projecting from the float chamber carry the mixing chamber, which consists of a horizontal cylinder, and the jets, generally three in number. Above the jets is a port which can be closed by the throttle and varied in area by an external sleeve having four different-sized apertures designed to provide a correct mixture under varying atmospheric conditions. Until the jets are uncovered by the throttle they are entirely outside the choke tube, and therefore subject to no suction from the engine. As the throttle opens the suction on each jet comes gradually into operation, and there is no dead spot. When any jet is uncovered there is no obstruction between it and the engine, even at small throttle openings. A stop is provided which can be set so as to allow the throttle to be closed only to a predetermined point. Thus the best position for starting and slow running can at once be obtained by fully closing the throttle lever.

We have one of these carburetters at present under test, and like its performance very well. The pick-up is excellent, and power good, but, as the carburetter has not yet been quite suited to our engine, the slow running leaves something to be desired, and we can as yet say nothing about the petrol consumption, and so shall refer to it again on a future occasion.



Elevation and sectional diagrams of the R.C.F. carburetter.



The R.C.F. carburetter fitted to a 3 h.p. Enfield.

AUTO CYCLE UNION NOTES.

(Officially communicated.)

INCREASING A.C.U. MEMBERSHIP.—There is no falling off in the number of applications for membership received at the headquarters of the Auto Cycle Union, and new members are joining at the rate of over 500 per week.

THE A.C.U. LIBRARY.—Members of the Auto Cycle Union are reminded that there is a comprehensive library of manufacturers' catalogues, which are

kept up to date, at the offices; and that these are available for personal perusal. In the event of a member desiring the catalogues of several firms, these will be sent by post on the understanding that they are returned to the A.C.U.

OFFICIAL BENZOLE TESTS.—The Auto Cycle Union is prepared to analyse samples of benzole for members who feel that fuel they have bought is not in

accordance with the standard set by the benzole companies.

SECOND-HAND MOTOR CYCLES.—The services of the Auto Cycle Union experts are available for the assistance of members buying second-hand motor cycles and cycle cars. The A.C.U. cannot undertake to purchase machines, but will advise prospective buyers whether to invest in any particular machine.

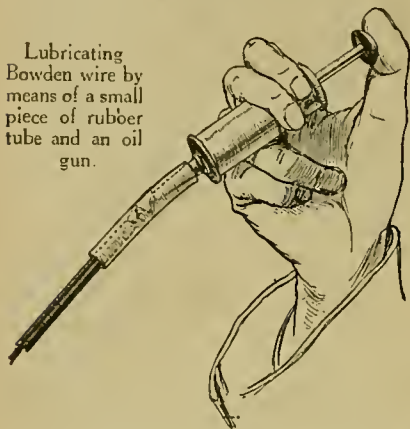
IDEAS: Useful and Ingenious.

Pyron R. Stone

Lubricating Bowden Wire.

A HINT for lubricating Bowden wires is submitted by Cpl. Oddy, from Belgium. He suggests that one end of a short length of rubber lamp tubing be placed over both inner and

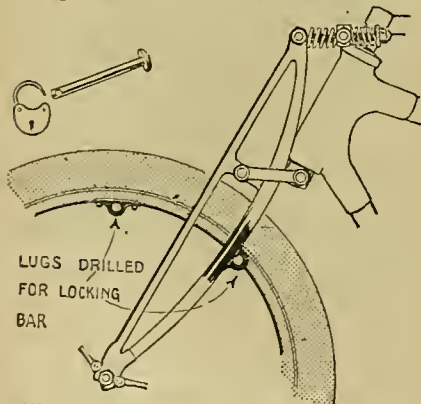
Lubricating Bowden wire by means of a small piece of rubber tube and an oil gun.



outer cables, oil being forced into the other end by means of a small oil gun. Cpl. Oddy states that in a few seconds oil will emerge at the other end

An Anti-theft Lock.

MR. W. H. TRAILL sends a drawing of an anti-theft lock which has the advantage of locking the front wheel without any play such as exists when a chain is passed through the spokes, and which is liable to cause



Wheel lock suggested by Mr. W. H. Traill.

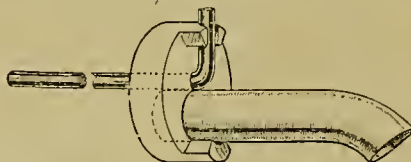
damage should the machine be moved with the wheel locked.

The suggested lock consists of strong eyelet lugs welded to the fork side members, and a steel loop riveted to the inside of the wheel rim, through which a steel pin may be inserted and secured with a padlock. It is advisable to fit two loops diametrically opposite each other, in order to balance the wheel.

Readers of "The Motor Cycle" are invited to contribute to this page any ideas successfully adapted to their motor cycles. Contributions will be paid for at our usual rates. Rough explanatory sketches will suffice

Emptying a Petrol Can without Waste.

A PIECE of $\frac{1}{2}$ in. or $\frac{3}{4}$ in. gaspipe soldered into the screwed cap of a petrol can and a small copper tube fixed as shown in the diagram will effectively pre-

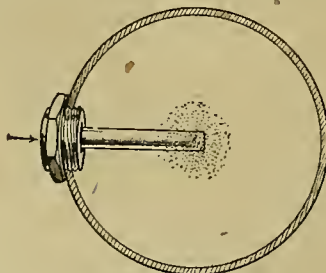


A device to prevent waste in emptying petrol cans.

vent waste when emptying the petrol from cans into the tank. This little device can easily be carried in the toolbag.

A Simple Starting Vaporiser.

MR. W. ANSON, a Leicester reader, forwards particulars of a simple vaporising device to assist in starting with the heavier grades of fuel. It consists of a small brass union which is sweated into a piece of small bore copper piping, closed at the end, and provided with two very small holes diametrically opposite to each other. The device is screwed into the induction pipe and is used in conjunction with a petrol squirt to inject the fuel which is atom-

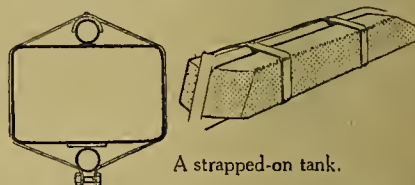


Vaporising jets in the induction pipe.

ised by its passage through the small holes. Mr. Anson states that heavy fuels never fail to give a quick start when vaporised in this manner.

Fixing a Tank.

A SHEFFIELD reader—Mr. W. H. Beresford—having had trouble with petrol leaking from his tank via the holes for the screws which secured it in position, overcame the difficulty by strapping the tank on to the frame by means of sheet steel strips tightened by $\frac{1}{4}$ in. bolts. At the top of the bands short



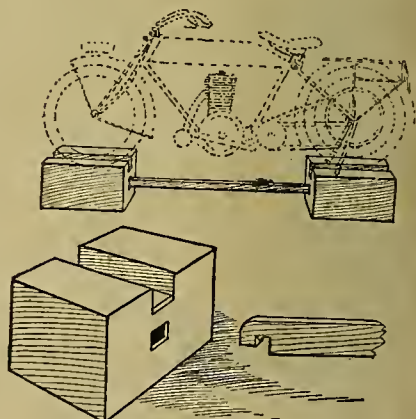
A strapped-on tank.

pieces of steel were bent to follow the half circumference of the top tube and riveted to the straps, thus preventing any possibility of the band twisting round.

Between the bottom of the tank and the lower tube of the frame our correspondent inserted three-ply wedges.

A Convenient Work Stand.

MOTOR cyclists who have adjustments and repairs to make to their machines know the advantage and desirability of having the machine raised off the floor. In the average motor cycle shed, however, there is rarely sufficient



Details of a portable work stand.

room to store a permanent work stand when it is not in use, hence the suggested "portable" stand illustrated here may appeal to those with limited space. The component parts of this stand are made from two mineral water cases, and a length of $1\text{ in.} \times 2\frac{1}{2}\text{ in.}$ wood about 6 ft. long. The necessary alterations to the cases and general details are of such a simple character that any motor cyclist could make the stand.

Birmingham M.C.C. Easter Competition
"Victory" Cup Trial.

B.S.A.

FOUR GOLD MEDALS

L. BAKER, L. L. SEALEY, C. PERCIVAL, and H. R. LANE, and

FOUR SILVER MEDALS

R. H. NICHOLLS, A. A. FARR, W. R. STEEL, and E. HILL,

OUT OF EIGHT ENTRIES.

GREAT SUCCESS OF B.S.A.

in Copenhagen Motor Cycle Club's Race.

Our Agents wire :

Received from Copenhagen, April 22nd.

"In Copenhagen Motor Cycle Club race April 12th and 13th, 400 miles, 2 B.S.A. motor cycles came in as Nos. 1 and 2.

They were the only motor cycles or cars that completed the race within stipulated time."

B.S.A. Motor Bicycles for Reliability and Speed.

New Catalogue Post Free.

THE BIRMINGHAM SMALL ARMS CO., LTD., BIRMINGHAM.

**"14 POINTS"
OF THE NEW 3 H.P.**



**"FUNDAMENTALLY DIFFERENT
from the ordinary run of Motor Cycles."**

Mr. B. H. Davies in "The Motor Cycle."

*Ideal
for
Sidecar
Work.*

1. Perfectly balanced engine.
2. Overhead valves.
3. Detachable cylinder heads.
4. Steel cylinders.
5. Hand-controlled enclosed clutch.
6. Four-speed gate-change gear box
7. Enclosed transmission
8. Perfect suspension
9. All black finish.
10. Adequate weather protection
11. Single lever control.
12. Car-type brakes
13. Real quietness.
14. Automatic lubrication

Price £85.

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THROUGH FEMININE GOGGLES.



Where are the Ladies' Models?
Sidecar Machines Favoured.
Ex-Service Drivers in Reliability
Trials.

THE prospect of new models designed especially for our use appears scanty. Most manufacturers are concentrating on models for men, and, considering the proportion of women in the country as compared with men, this is rather surprising, unless it is assumed that a lady will ride the standard machine. In view of the limited output for the next few months, and the increased demand for the standard models, not many firms are listing an open-framed mount for the 1919 season. The Douglas manufacturers tell me that they intend making a few ladies' models later in the year.

Power for Sidecars.

We may give a sigh of regret for the little two-stroke ladies' Clyno that was just being perfected before motor cycle factories were converted to war purposes. This machine promised remarkably well, but, unfortunately, has been put aside for specialisation on their other two models. We hope that later on these designs will be brought forth again for those who have objections to the closed frame. There are still, however, plenty of good designs, allowing of a varied choice. Except for the veriest beginner, power enough to permit a sidecar to be attached is best for all-round purposes.

Most girls, who were war service motor cyclists, used $3\frac{1}{2}$ h.p. machines, and it is scarcely likely that they will be satisfied with a lower power when they select their own 'bus. In my opinion, it is always unwise to attach even a featherweight sidecar to a lightweight; there will inevitably dawn a day when the engine will be overdriven, and the wear and tear will be so much greater than with a machine having reserve power. The raw novice will be in a quandary as to which of the many excellent makes to purchase, but by studying the pages of *The Motor Cycle*, and bearing in mind that the lowest-priced article is not necessarily the cheapest in the end, one should be sure of umpteen miles of pleasure.

Many people despise the cane sidecar body, the coach-built being more fashionable and smarter in appearance, and possibly warmer for winter riding, but the two most comfortable sidecars I recollect were of cane con-

struction, one the standard Enfield of about 1913 and the other a Gloria with a sprung wheel. My passenger frequently wishes it were fashionable to have a cane sidecar still.

I am interestedly watching the types of mount favoured by the women who are to be demobilised. Having ridden in all weathers and conditions, the most proficient of these riders should put up a good performance in future reliability trials.

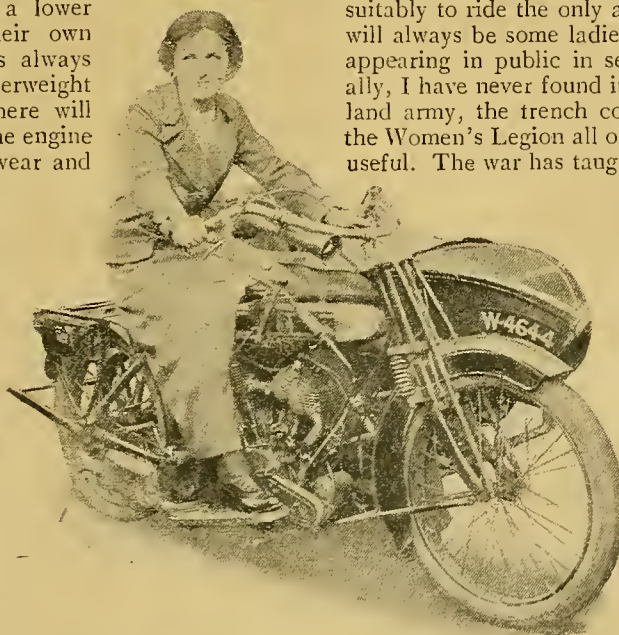
We are promised much in the way of comfort by spring frames, and improved engine design will conduce to ease of starting. The Raleigh people promise us a specification that should suit the lady driver. The thorn in the rose, however, is the high price quoted all round. One could have obtained a light car in earlier days for the price of a medium sidecar outfit of to-day, and this, too, just as petrol has become easy to obtain and promises to be of better quality. In a few years' time, when factories are in full swing, the output of motor cycles should be great enough to allow a substantial reduction in price, but for 1919 riding we must "pay the piper."

The Influence of the War on Dress.

The dress question should vex us no more, accustomed as we now are to a rational costume in many of the forms of labour undertaken by women. They, at any rate, will not be afraid to clothe themselves suitably to ride the only available motor cycles. There will always be some ladies who still have qualms about appearing in public in semi-masculine attire. Personally, I have never found it difficult to ride in skirts. The land army, the trench coats, and the sensible caps of the Women's Legion all offer suggestions which are very useful. The war has taught us much, and, among other

things, how to dress practically and becomingly. There is a greater selection now in any of the well-known stores, such as Dunhills, than some few years ago we could have found in all England. Scarcely any garb is proof against sixteen degrees of frost, so winter riding may not become very popular with women, but for spring, summer, and autumn we have everything that can be desired to make post-war motor cycling one huge success—save the machines. Mr. Manufacturer, *do* hurry up and get them on the market?

MAY WALKER.



Miss James, an enthusiast who believes in plenty of power.
Her mount is a 7-9 h.p. Premier.

COMPONENTS OF THE MOTOR SCOOTER.

Report upon the "Eveready" Autoped by an Eminent Engineer.

IT is probably true that fewer than a dozen people in this country know the mechanics of the American Autoped. We know that exorbitant prices have been paid by engineers interested in the motor scooter to obtain these details. Therefore, in view of the great interest manifested in this type of machine, the description and drawings we are able to give here and on page 463 are of more than usual interest to readers generally and prospective makers of scooters in particular.

An eminent engineer connected with the car and aviation industries has purchased one of these machines, and the drawings reproduced have been executed by his technical staff. They show in detail many points which have mystified would-be designers of motor scooters, and prove many assumptions regarding their mechanics to be wrong.

Full details of the transmission, clutch and brake mechanism, and the flywheel magneto, are clearly shown, together with a side elevation and plan, all drawn to scale.

Specification.

The following is the engineer's description and report upon the practicability of the machine.

(1.) ENGINE.—The single-cylinder engine is of 155 cubic centimetres capacity, with a bore and stroke of 56 x 63 mm. respectively, automatic inlet valve, mechanically operated exhaust valve. The engine is mounted on the left-hand side of and on the same axis as the front wheel, which is driven through a back gear and disc clutch, the gear ratio being 5.2 to 1. Cast iron cylinder, piston, and rings.

(2.) DRIVING MECHANISM AND FORECARRIAGE.—The engine crank case has a tubular extension, forming a support externally for the clutch operating mechanism, clutch driving gear, clutch discs and front wheel hub, and poles of the flywheel type magneto. Internally, the crank case extension carries the crankshaft, on the conical end of which is the flywheel containing the magneto magnets. The back gear bearings are also supported by the crank case, which, in addition, provides the lugs for the operating lever of the internal brake acting on the front rim. The usual front wheel fork is replaced by a frame formed of two sheet steel plates fitted to the top and extension of the crank case respectively, the upper part serving to carry the head of the frame and steering column or pillar, forming as a whole a complete forecarriage or power unit. Case-hardened steel gears and cone type ball bearings are used, with the exception of the main crankshaft bearing.

(3.) CONSTRUCTION.—Steel pressings are employed throughout. The steering column with its handle-bar is the only tubular member contained in the structure. Lateral stability remarkably good.

(4.) WHEELS AND TYRES.—Sheet steel disc type, fitted with 15in. x 2½in. Goodrich tyres.

(5.) WHEELBASE.—35½in.

(6.) BRAKES.—Fibre-lined shoe or band, engaging on internal surface of extension of the front wheel rim, controlled by the rearward motion of the steering column.

(7.) CARBURETTER.—Primitive jet and pipe arrangement, remarkable chiefly for its inefficiency and reluctance to work. Substitution of carburetter of approved type is essential. Diameter of inlet pipe ⅝in.

Controls and Comment.

(8.) CONTROL.—The front wheel brake and the disc clutch are connected to the steering column by means of links and rods, and operated by the forward or rearward motion of the steering column. The maximum forward position of the steering column is controlled by a stop, which provides a location for the actual running position when the clutch is fully engaged and the brake fully released. A slight rearward motion of the steering column disengages the clutch, providing a free engine, while a further rearward motion brings the front wheel brake into action. Throttling is effected by a varying degree of lift of the inlet valve, actuated through a Bowden wire from a twisting grip of the handle-bar. The ignition is fixed, and no switch is fitted. It is considered that the arrangement of control leaves much to be desired. Separation of the interconnected clutch and brake is regarded as essential, and the incorporation of variable ignition and an exhaust valve lifter is very necessary.

(9.) WEIGHT.—Completely equipped as delivered, 96 lb., of which 76 lb. is contributed by the power unit or forecarriage.

(10.) CONCLUSIONS.—The Autoped may be regarded as a handy single-track automobile strictly for runabout use. Continuous journeys up to ten miles are made without fatigue under ordinary road conditions. It can be used, and successfully handled, on short journeys under conditions and in situations that are seen to be inconvenient or impossible with an orthodox motor cycle, and it is found that the facilities with which this machine is handled under such conditions are restricted by the addition of a seat or saddle. The steadiness and cleanliness of the machine under adverse weather condition leave nothing to be desired.

With the few modifications named it is considered that the machine in its present form is ideal for the purpose it serves, and it may be regarded as the most usable and manufacturable design so far published.

It is found that the machine appeals to all classes of a large public to whom the orthodox motor cycle is not attractive, and it is felt that the very large demand that undoubtedly exists for this class of vehicle would have no influence on motor cycle sales.

COVENTRY AND WARWICKSHIRE M.C. MANVILLE CUP TRIAL.

ON the 24th inst. the valuable trophy known as the Manville Cup, and named after the donor, the president of the club, Mr. Edward Manville, M.P., will be competed for by members of the club.

The event will take the form of a non-stop trial over a course of 81 miles. There will be an interval of one hour for tea, which will be taken at the Round Tower, Edge Hill, the start and finish being on the outskirts of Coventry. Included in the event will be a stopping and starting test on a hill. There will be only one secret check in the trial, which will be used to decide the winner in the event of there being a tie.

The premier award will be held for one year by the winner, in addition to a permanent prize.

CLASS 1.—SOLO.

- A. Up to 350 c.c.
- B. Up to 550 c.c.
- C. Up to 1,000 c.c.

CLASS 2.—SIDE CAR OUTFITS.

- A. Single-cylinder sidecar outfits.
- B. Multi-cylinder sidecar outfits.

CLASS 3.—CARS.

- A. Cars with engines not exceeding 1,500 c.c.
- B. Cars with engines exceeding 1,500 c.c.

Provided that there are not less than five starters in a class, the winner of the class will receive a prize.

The entry fee for the trial will be 5s., and anyone wishing to join the club for the event must send in his name, together with club subscription of 10s., to the hon. secretary, Mr. M. F. W. Sampson, 19, Hertford Street, Coventry, not later than May 17th.

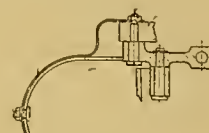
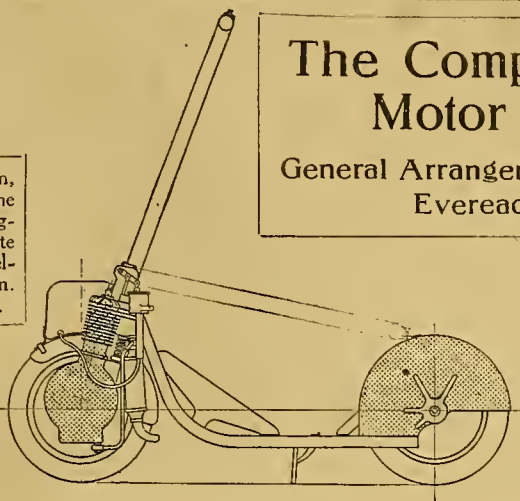
Entries for the trial, which must be accompanied by the 5s. entrance fee, should be sent to the trial hon. secretary, Mr. J. F. Spencer, Priory Street, Coventry, from whom the rules governing the event may be obtained.

A large number of entries are expected.

The Components of a Motor Scooter.

General Arrangement Drawings of the Eveready Autoped.

Side elevation, showing the hinged steering-pillar to facilitate storage. Wheel-base, 35½ in. Weight, 96 lb.

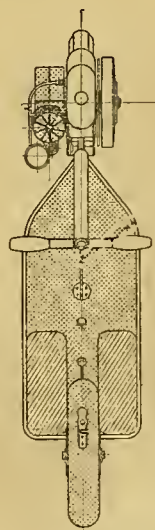
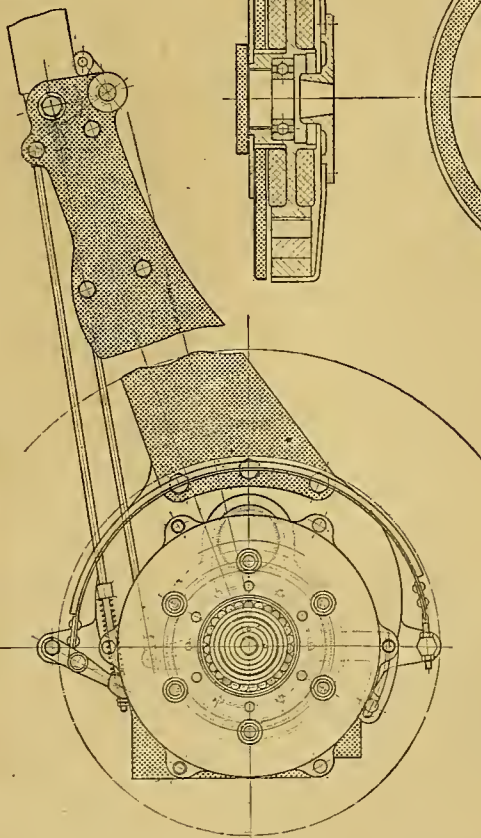
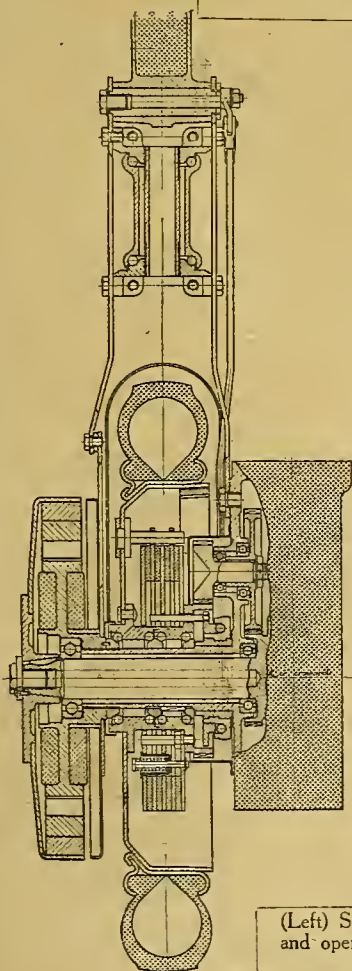
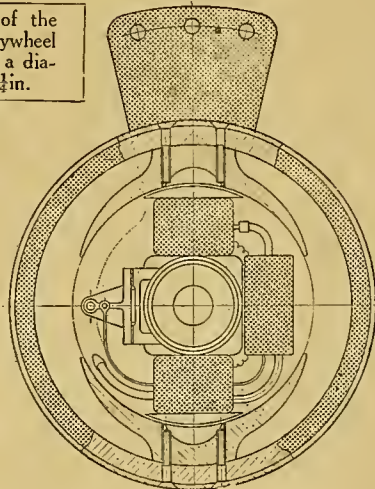


Section through brake lever.

Section through the rear wheel, which is of the steel disc type, fitted with 15 in. x 2½ in. tyre.

Section through the flywheel, which embodies the magneto.

Details of the magneto flywheel which has a diameter of 9½ in.



(Left) Section through front wheel, showing details of transmission, clutch, and operating mechanism. (Right) End view, with flywheel, magneto, and road wheel removed.

Plan of Eveready Autoped.

THE TWO-STROKE ENGINE.

Lines of Development in Competition with the Four-stroke.

JUDGING by the sudden increase of its numbers on the road just prior to the war, the two-stroke motor cycle claimed an undoubted popularity in a certain section of the motor cycling community. Its devotees primarily, I think, sprang from the ranks of lightweight riders and the fair sex. Since then it has proved itself a reliable little mount, and more than useful where speed was not the first essential, though from consideration of design with our present knowledge no attempts have recently been made to put on the market a larger engined machine to compete with the four-stroke types.

Although superficially the two-stroke is by far the simpler engine, it is really more complex from the designer's point of view than the four-stroke. The details of its design are positively crowded with unsatisfactory compromises—advantages balanced against disadvantages all the time. One of the principal requirements of the two-stroke is a good mixture at all speeds, which is never obtained in practice. Nevertheless, in the better-known models now marketed these defects are so minimised that they make quite a good showing compared with the four-stroke models, and are immeasurably more comfortable to ride than four-strokes having a similar number of cylinders.

The principal points considered by the average purchaser of these machines are the smooth running, extremely easy starting, even torque (making it safe to ride on greasy roads), an attractive exhaust note—whether this would apply in larger models remains to be seen—and the absence of valve clatter.

Theoretical Advantages.

Naturally the fundamental advantage of the two-stroke over the four-stroke lies in the fact that a higher power output is obtainable per c.c. Theoretically this increase should be 100%, as there are twice as many power strokes for an equal number of revolutions. Up to the present, however, it cannot be claimed that any two-stroke has attained this superiority, 20% extra power being nearer the mark. Another equally important advantage is derived from the fact that an impulse stroke

is obtained every revolution, against every other revolution of the four-stroke. This even torque results in a much better pulling power and a big reduction in the strains to which the engine, transmission, and frame are put.

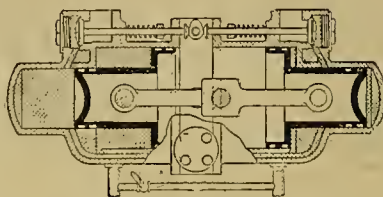
The ordinary type which we are considering is remarkably simple in the number and construction of its working parts—it is, indeed, the most simple design of engine in existence, there being only three moving parts (piston, connecting rod, and crankshaft). This fact largely discounts the advantages which are possessed exclusively by the four-stroke. To go to the other extreme, there is no reason why a two-stroke engine more complicated in design than the conventional type, even embodying as many parts as the four-stroke, should not successfully compete with the latter, provided that its own special advantages are exploited to the full. Those two-stroke designs, providing a charging pump

of larger capacity than the cylinder volume swept by the piston, allow of the whole compression space to be utilised to the fullest advantage and the h.p. increased accordingly—and more than make up for the power lost on the opening of the exhaust port. The majority of two-strokes also possess most compact combustion chambers, which make for higher thermal efficiency. A big recommendation, too, is their flexibility, rendering the employment of an extensive gear range unnecessary.

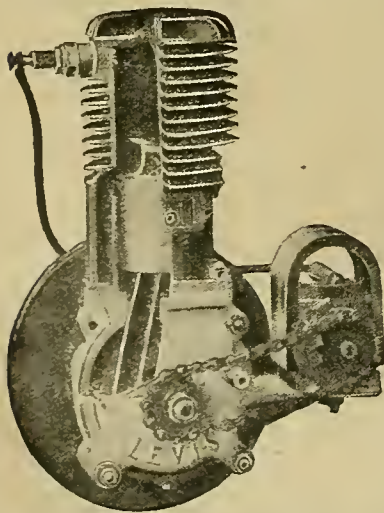
Fuel Consumption.

But a second gear ratio is desirable, as the complaint of inflated fuel consumption usually comes from those who tune their machines to climb any main road hill on a single gear. This usually means that a large jet is fitted, with consequent high petrol consumption. It is generally found, however, that a two-stroke machine tuned to give only the same hill-climbing capacity as a four-stroke is quite as economical as the latter type, from 100 to 130 m.p.g. being obtained with engines of 250-300 c.c. capacity.

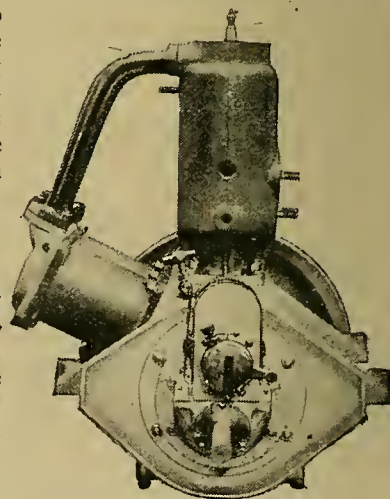
The power which is used to compress the fresh charge of mixture in the crank case is obviously wasted as it expands again while entering the cylinder. Some designs increase the power by a special



The Rowe engine, a two-stroke with truncated pistons, the lower halves of which act as charging pumps. Mechanically-operated exhaust valves are incorporated.



The conventional type of lightweight two-stroke engine, a Levis.



The Ricardo engine, having a separate charging pump, the idea being to overcome scavenging defects.

The Two-stroke Engine.—

transfer arrangement, enabling the pump to surcharge the working cylinder.

Another weakness in conventional two-stroke design is the reduction of the effective stroke by the opening of the exhaust port, causing a rapid fall of pressure, also the fresh charge cannot exceed the volume contained above the top of the exhaust port, and some of the mixture is generally lost. Then, again, the running is liable to be somewhat erratic when throttled down, with a consequent loss of the power of acceleration. Two other two-stroke weaknesses are the carbonising of the top ring and an objectionable "rattle."

However, most of these troubles can be much reduced. It will be seen, therefore, from this *resumé* of the pros and cons of the two-stroke engine that much pioneer work still remains to be done before it can compete, with any hope of success, with the highly-developed four-stroke type for engines of larger size than the lightweight. That it has possibilities must be admitted, as witness the immediate popularity of the more successful designs, and it only needs careful consideration, experience, and attention to detail to bring it to a commercial footing equal to the poppet-valved engine in every respect as a power unit for the sidecar motor cycle.

MASCOT.

QUALITY AT MINOR POINTS.

On the Policy of including Bought-out Fittings in the Motor Cycle Guarantee.

DO manufacturers submit proprietary fittings to proving tests to satisfy themselves that such components are of a quality that will enhance their reputation? On first thoughts one would say the answer to this question is self-evident, and that no manufacturer would knowingly risk his reputation by fitting to his machine articles of unproved quality.

On the other hand, experienced motor cyclists will call to mind many annoyances—petty and otherwise—the possibility of which could have been greatly minimised by a thorough proving on the part of the cycle manufacturer of the articles concerned.

Increasing Prestige.

By the omission of a few simple tests the reputation of a machine is often jeopardised, and it would appear questionable policy to run such risks with any machine, irrespective of its price.

It is common practice to exclude from the selling guarantee of a machine the specialities manufactured by another firm. Would it not be much more valuable as a selling proposition to include in the guarantee the whole machine and fittings, without any exception?

The onus of fitting reliable units would fall wholly on the manufacturer, and the cheap shoddy fittings on the cheaper grade of machine would disappear.

Each firm should thoroughly prove to

its own satisfaction that the articles fitted to its machines are of a good quality, and the motor cycle industry would greatly benefit in prestige as a result of the increased reliability, and of the longer wearing qualities throughout.

A Proving House.

It is, of course, appreciated that small firms could not maintain the requisite staff and equipment for submitting the various specialities to rigorous tests, and probably the best solution lies in the founding of a proving house for every conceivable fitment made use of by the motor cycle manufacturer. Unquestionably, such an institution would be invaluable as an aid to the development of the motor cycle, although it need not necessarily be confined to the motor cycle or any particular branch of the engineering trade, but rather exist as a national trade institution.

Some of the items which should be submitted to these tests are magnetos, high-tension cables, tool bags, saddles, sparking plugs, chains, carburettors, controls, proprietary lubricating devices, compression taps, petrol taps, belt fasteners, etc. Only by the continued testing and proving can the quality of manufactured goods be maintained and improved, and by the full use of these means will the evolution of the perfect motor cycle be accelerated. A.E.



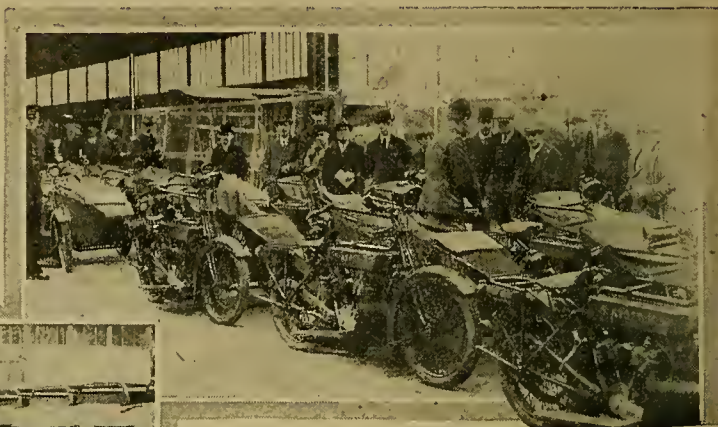
SIDECARRING IN HERTFORDSHIRE.

A ford across the river Ver, whence is derived Verulamium, the old Latin name of St. Albans. The outfit is an 8 h.p. Matchless.

Motor Cycles from £16 to £150.

Another Auction Sale of Used Machines.

HIGH prices were again the rule at a sale of privately-owned and U.S.A. Army motor vehicles held by the Auction Department of the Grahame-White Co. at Hendon on the 29th ult. Among the privately-owned vehicles were a few motor cycles. Sandwiched in among the cars was a $3\frac{1}{2}$ h.p. 1913 Premier with a Supreme coach-built sidecar, two-speed countershaft gear, just overhauled and newly painted, which went for the very high price of £60.



(Left) The auction in progress. Keen interest was manifested in the Enfields. (Right) An American soldier explaining various points of the machines to interested spectators.



While at the sale we met H. F. Edwards, formerly a member of the M.C.C. Committee, who bought two Enfield combinations at £120 each. He was discharged from the Army last autumn, after having had long service with the M.T., and having been blown off his motor cycle by a shell.

The next motor cycle on the list was a 1911 single-cylinder Kerry, of very ancient appearance and with automatic inlet valve. This brought £16, while a 1911 7-9 h.p. two-speed Indian, minus a silencer, rather a racing-looking mount, was sold for £19 and appeared to be cheap. The next motor cycle put up was described as a 1911 $2\frac{1}{4}$ h.p. Calthorpe. This had a 2 h.p. Precision power unit with a Dixie magneto, and appeared to be a 1914 model. Although the rear brake was missing, this was sold at £20.

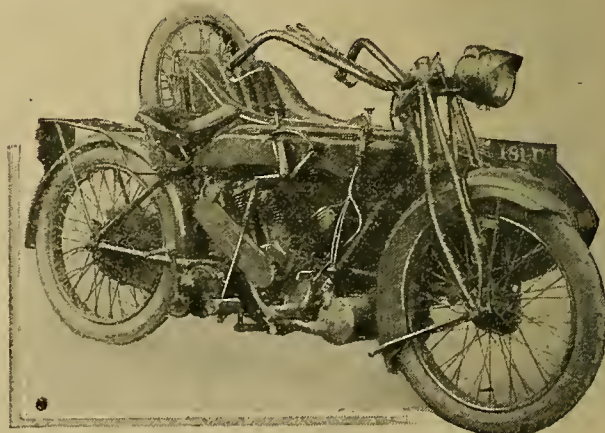
A Mixed Lot.

Among the U.S.A. Army motor vehicles were a number of motor cycles in excellent condition, though there were a few exceptions. One of these was a New Imperial motor cycle and sidecar with gear box removed, forks twisted, footrests bent, and was generally in poor condition, which was sold for £44, while a similar machine with sidecar wheel buckled, front forks twisted, and many parts missing was sold for £57. Properly regarded as among the scrap was a Matchless motor bicycle and sidecar, the front cylinder of which was missing and the piston broken, which fetched £80. Next followed four Douglasses and sidecars which went for £90 each, and then came seven Royal Enfield motor cycles and sidecars, which were eagerly snapped up. The first, after the bidding had started at a fairly low figure, was knocked down at £135, while for the next the bidding started at £100, and it was sold for £110. The highest priced Enfield fetched £150.

The last of the machines to be put up for auction were ten Enfield sidecar combinations, which fetched from £115 to £125, one of the most expensive being without a chain.

THE POLICE AND REGULATIONS.

THERE is a great deal of police persecution at the present time against motorists of all classes. Motor cyclists are being prosecuted, not only for exceeding the speed limit, for having dirty number plates, irregular lights, and other causes, but for not having two independent brakes. The police seem quite at a loss to interpret the regulations correctly, and think that the only system allowed is when there is a front wheel brake and a rear wheel brake. Any motor cyclist whose mount conforms to the regulations, and yet has been summoned, is asked to communicate with the Secretary of the Auto Cycle Union, 83, Pall Mall, London, S.W.1.



A Matchless outfit with broken cylinder that sold for £80.

CURRENT HAT

Times to Light Lamps.

SUMMER TIME.			
May 8th	...	9.0	p.m.
" 10th	...	9.3	"
" 12th	...	9.7	"
" 14th	...	9.10	"

92.5 m.p.h.

A speed of nearly 92½ m.p.h. was attained recently by Ray Creviston, riding an eight valve Indian, over a five mile course in Portland Oregon.

Police Activity in Surrey.

While the Surrey police are pretty good as regards not trapping in the open country, they are very active in towns, especially in ten-mile speed limits. In Farnham the other day a motor cyclist was fined for travelling at from twelve to fifteen miles an hour. Traps in the open country in Surrey are to be found only in districts included in the Metropolitan Police area.

French Motor Cycle Competitions.

Though the leading lights in the motor cycle world in France do not intend to go in for serious competitions this year, the Competitions Committee of the Moto-Cycle Club of France has decided to hold a touring trial over the Paris-Epernay-Rheims road, and back to Paris. The date and details will be fixed later, but it is likely that the trial will occupy a single day, and the average speed will be 20 m.p.h. for solo mounts and rather less for sidecar machines. There will be a hill-climb on the course. The trial will be held subject to the approval of the French Moto-Cycle Union.

London-Edinburgh Entries.

It is anticipated that this year's London-Edinburgh run will attract a record number of entries. The following have already sent in their entry forms:

E. Bridgman (7 Indian s.c.).
Rex Mundy (8 Matchless s.c.).
Jas. McKenzie (6 w.c. Humber s.c.).
A. Mabon (4 Mabon s.c.).
W. A. Fell-Smith (7 Harley-Davidson).
E. M. P. Boileau (3 A.B.C.).
W. Cooper (—).
A. Candler (15 Rover car).
C. J. Myson (10 Singer).
W. C. Henry (2½ Metro-Tyler).
W. H. Wells (25 Overland car).
A. Noble (10 A.C.).
W. G. Brownson (10 A.C.).

Opening Run of the Streatham and District Motor Cycle Club.

After a week more like January than May, the weather was reasonably fine for the opening run of the Streatham and District M.C.C. to Clayton Arms, Godstone, last Saturday. The attendance was fairly good, about forty being present. More would have been there but for the late delivery of new models, many members still being without machines. This same reason accounts for the small number of cars present. A few of the old Streatham members were in attendance, including W. Pratt, the old P. and M. rider, now in "civvies," but, we are sorry to say, still on crutches. He was wounded about eighteen months ago, and, as he is still under treatment, it is doubtful if he will ride much this year. Other members present were the Hunter brothers, Messrs. Boutle, L. Barratt (chairman of the club), Bateson, Hine, and C. A. H. Mason.

Special Features.

100,000 A WEEK.

COMPONENTS OF THE MOTOR SCOOTER.
SPRINGING THE MACHINE.

Bad Roads in Liverpool.

A Liverpool doctor calls our attention to the disgraceful state of the roads in certain parts of Liverpool, particularly in side streets, where the surface is frequently strewn with broken bottles and other refuse dangerous to motor cyclists.

No Super-tax on Petrol after the 17th.

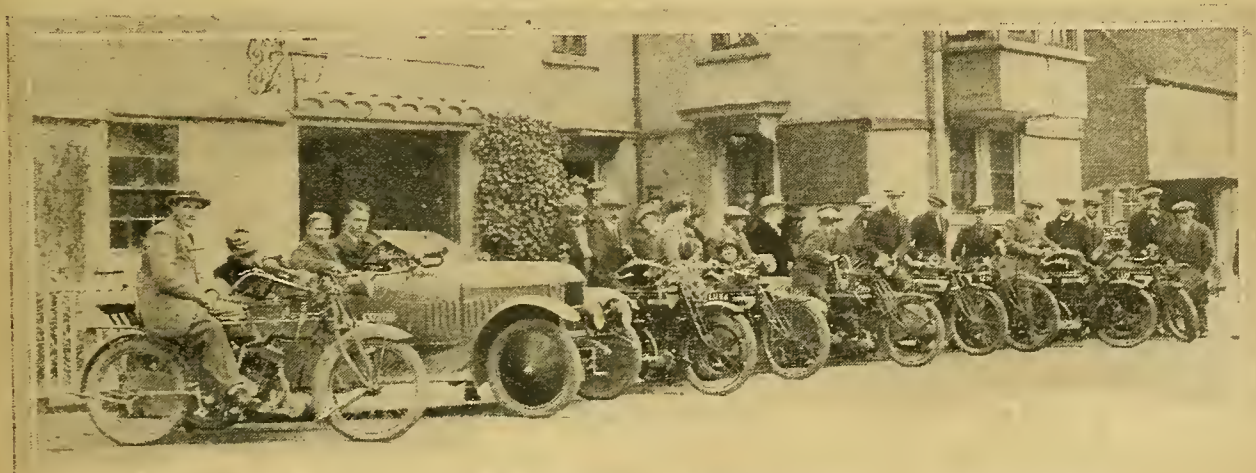
In reply to a question by Mr. Joynson Hicks, Mr. Chamberlain, the Chancellor of the Exchequer, announced in the House that he hoped "the duty will go on the 17th of May, and the Petrol Control Department very soon afterwards."

French Two-stroke Cycle Car.

A new cycle car, to be known as the Sicam, and fitted with a two-cylinder two-stroke engine (65 mm. x 75 mm.), and cooled by means of a fan, will shortly appear on the French market. The transmission will be through a cone clutch, the final drive to the rear wheel being by belts over expanding pulleys. The vehicle will be sold complete with hood, screen, and electric lighting for approximately £140.

Victory Cup.

Mr. K. A. Gilmour, the Australian rider, who entered the Victory Cup Trial at the starting point rode a Villiers engined machine made by Messrs. R. Walker and Son, of Tyseley, Birmingham.



The Streatham and District M.C.C. revived. Members who attended the opening run to Godstone last Saturday.

Service Men in Birmingham M.C.C. Trial.

Fifty per cent. of the entrants for the recent Victory Cup Trial were members or ex-members of H.M. Forces.

Cheaper Petrol.

This month motor cyclists may confidently expect a tardy, though none the less welcome, reduction in the price of petrol.

Whose Gloves?

If the air mechanic riding a Blue Indian, who assisted a Rudge rider in trouble with his magneto near Orsett Cock, will send us his address the gloves he left behind will be returned to him.

A Novel Use for the Sidecar.

Near a riverside resort we saw recently a light racing outrigger skiff being transported a distance of some eight miles through traffic and country, turned upside down on a sidecar chassis. With about twenty feet of a delicately built shell sticking out fore and aft, the driving in traffic was a very ticklish matter.

Complaints.

We understand from the A.A. and M.U. that complaints have been received from residents in Maidenhead regarding the speed of motorists in that town, and that unless drivers more scrupulously observe the speed limit through Maidenhead, the police authorities will take action. Another complaint which has reached the Association relates to the increasing use of open cut-outs in the neighbourhood of Prince's Gate.

Disfiguring Road Signs.

The Royal Automobile Club's campaign against the disfigurement of the countryside by huge posters and other objectionable advertisements is meeting with considerable success. The well-known Scapa Society is working with the Club to induce local authorities to use the powers conferred upon them by the Advertisements Regulation Act of 1907. To save these authorities time and trouble a model set of byelaws accompanies the explanatory memorandum sent to them. These byelaws comprise the forms and embrace the modifications or extensions which have from time to time received the approval of the Secretary of State.

The Industrial Reconstruction Council.

A conference on "Costing in Relation to Scientific Management" will be held under the auspices of the Industrial Reconstruction Council on Tuesday, the 13th inst., at 5.30 p.m., in the Hall of the Institute of Journalists, 2 and 4, Tudor Street, E.C.4. The chair will be taken by Sir Herbert Austin, K.B.E., and the address given by Mr. J. H. Boyd (Director of Costs and Efficiency Methods, Central Stores Department, Ministry of Munitions). No tickets are necessary.

The third lecture of the series arranged by the Industrial Reconstruction Council will be held in the Saddlers' Hall, Cheap-side, E.C.2, on Wednesday, the 14th inst. The chair will be taken at 4.30 by Sir Lynden Macassey, and a lecture on "The Economic Limits of Nationalisation" will be delivered by Brig. General Cockerill, C.B., M.P. Applications for tickets should be made to the Secretary, I.R.C., 2 and 4, Tudor Street, E.C.4.

Note to Readers.

Readers are requested when writing to *The Motor Cycle* to comply with the instructions to be found each week at the head of "Letters to the Editor" and "Questions and Replies." Neglect of this causes delay and unnecessary trouble. Letters should be sent to Coventry, queries to London.

Mr. S. L. Bailey.

The well-known Douglas manager is suffering from the effects of a car accident which occurred near Bath during Easter. He must perforce attend to his duties one-handed for the next few weeks, otherwise he came off luckily.

French 1919 Models.

The firm of Terrot will concentrate on two types—a single-cylinder 2½ h.p. and a 4 h.p. twin. The single-cylinder has an engine 67×90 mm. and a variable pulley gear, price £72; while the twin is fitted with a two-cylinder engine, 64×97 mm., and a three-speed gear box and plate clutch, price £128, sidecar £38 extra.

The Revival of Motor Cycle Clubs.

There seems to be no doubt that the progress in the revival of motor cycle clubs is being considerably hampered by the non-delivery of new motor cycles. Many members are anxious to join clubs as soon as they can get delivery of their new mounts, and until they do they naturally do not see the point of sending in their subscriptions.

This is clearly the case with that sporting little body, the Public Schools M.C.C. The hon. secretary is in communication with numerous prospective members, but it is heard on all sides that few will join until they have something to ride. This fact led to the postponement of the hill-climb which was to have taken place on April 26th to a date which will be fixed later.

A Bosch Motor Cycle?

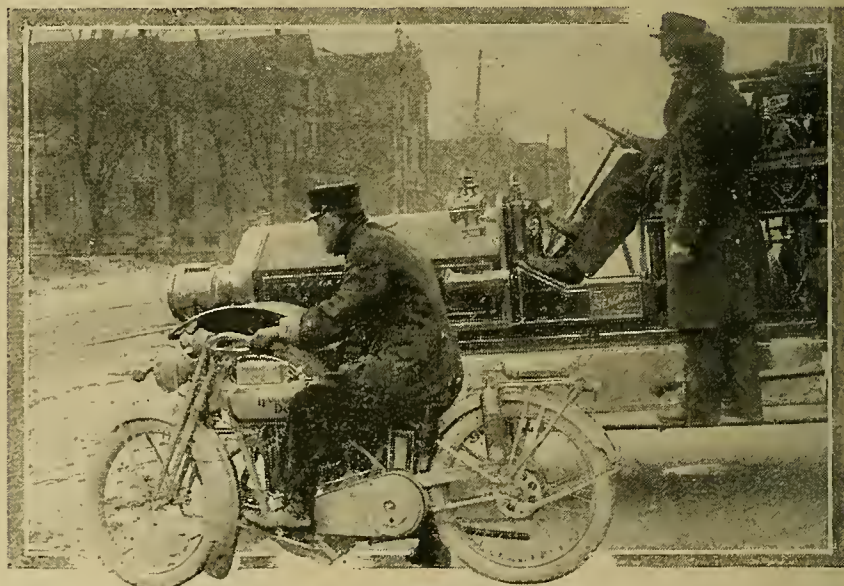
The Douglas firm are proud to find that amongst many items of interest which came to light after the Armistice is the fact that the Huns, having captured a Douglas electric power generating set, produced an almost exact copy under the name of the Bosch, presumably made by the magneto firm. So near a copy did they make that many parts of the flat twin engine are interchangeable with Douglas parts. Does this herald an attempt at a German flat twin motor cycle?

Patent Rights and the Enemy.

The previous paragraph leads one to wonder whether the peace terms are sufficiently comprehensive to include arrangements for the satisfactory settlement of the question of Allied and enemy patent rights. Will the German firms be allowed to continue infringing English patents after peace is signed?

1919 Dene Models.

The Dene Motor Co., Newcastle-on-Tyne, are specialising for this year upon the production of a big twin machine. The specification includes 8 h.p. V Jap engine, with Blic magneto behind engine, driven by chain from engine shaft. This design is a distinct "breakaway" from standard, and brings the contact breaker to the right hand side—a great convenience in sidecar machines. Transmission is by 5in. × 3in. Renold chain through Sturmey-Archer three-speed countershaft gear. Chains are enclosed in cast and machined aluminium cases. Back wheel quickly detachable and fitted with buffer drive to eliminate shock. Dunlop tyres, 28in. × 3in. Brooks saddle. The hubs are carried on Hoffmann journal bearings. The brakes are of the belt-rim type with compensating shoe operating inside the rim. The price will be £130. The firm also markets a 4 h.p. chain-cum-belt-drive model, the price of which is £95.



The utility and value of motor cycles for municipal service are beginning to be appreciated by city and town councils in this country, and in America they are used very extensively by police and other municipal bodies. The photograph given above depicts a 7-9 h.p. machine used by a fire department.

CLUTCH ADJUSTMENT

Excessive Pressure
a Common Cause of
Trouble.



HOW many motor cyclists thoroughly understand the working and adjustment of the clutches with which their machines are fitted? Quite a small percentage, I venture to think. To anyone it is clear that increasing the tension of the springs increases the gripping capabilities of the clutch, and there is a very large section of riders which, experiencing clutch troubles, at once flies to the all-important spring as the slacker of the moment. The result is that the average clutch in the hands of the average rider suffers from much higher spring pressure than would be necessary had the unit received that intelligent attention which its function and situation in life deserve.

On medium weight machines the gripping qualities of the clutch leave so wide a margin for the inefficiency of the rider that, in the case of an efficient rider—i.e., the man who understands his clutch inside out—the very lightest adjustment is sufficient for normal needs. For instance, I have myself possessed high-speed twin-cylinder machines of $3\frac{1}{2}$ h.p. or thereabouts fitted with gear box and clutch units of the same make and type as those similarly fitted to machines up to 8 h.p. On the $3\frac{1}{2}$ h.p. high-speed machine the pressure on the plates could obviously be reduced to about half that necessary for the 8 h.p., and considerable advantages were obtained by easing off the springs accordingly—especially if the clutch were hand-controlled.

Saving the Gear Box.

It may be taken as a safe rule to ride with the clutch as lightly adjusted as the load imposed upon it permits—avoiding, of course, clutch slip when ascending a stiff gradient on top gear. If the clutch does not slip under such conditions, or when starting up cold with the kick-starter, one can feel assured that no slip to trouble about is occurring on the lower ratio and therefore that there is little or no danger of burning the clutch out through too light an adjustment.

At all events, even though sufficient slip occur to warm the plates perceptibly during a period of stiff high-gear riding, this fact merely goes to prove that the clutch is performing the function it should perform. New plates are cheaper than repeated rear tyre and chain renewals, and certainly cheaper and less distressing than gear box troubles. It will come as no surprise to Overseas riders that gear box troubles have proved by no means a rarity on military machines serving under the conditions of the battle front, and that half these troubles are duly traced to the zealotry of the rider in guarding against clutch slip by screwing his springs fully, or almost fully, home—result, a clutch which is never quite free, or which

takes so much hauling out that a good deal of gear changing occurs with the engine under load.

Modern clutches will stand any amount of intelligent slipping, and if carefully kept and carefully adjusted they should function not only in the ordinary sense, but also as shock absorbers, thereby saving transmission, tyres, engine, and indeed the machine throughout. One would seriously recommend riders who do not feel themselves entirely *au fait* with the clutch they use to make a point of mastering this unit, as upon it depends the reliability of the mount. Often at the end of a year or so a gear box gives out or a frame breakage occurs or spokes yield or the engine develops a knock; the part that goes is condemned as weak, whereas the sole weakness lies in the rider in that he has not understood, and in his ignorance neglected, that all-important unit—the clutch.

Adjustment.

So much agreed then, a word or two on arriving at the proper adjustment may be of help. It is really a job to be done by the correction of road test—a job for the skilled tester—but with a little sound judgment and the application of a small amount of mechanical commonsense, rule-of-thumb tactics can be successfully applied.

The rough and ready rule of thumb is that an engine develops power more or less in proportion to that required to jerk it over compression by the application of the hand to the back wheel. Therefore, jack the machine on the stand, and ease off the clutch till perceptible slip is obtained when trying to jerk the engine over in the manner described. Tighten up the clutch slowly till no slip whatever is perceptible under the most violent jerk, then give the adjustment another half-turn for luck. When next hieing forth, watch carefully for clutch slip, and should it occur tighten up till it is eliminated. Do not forget that no amount of tightening will achieve the results desired unless the plates are in reasonably good order and the push-rod adjustment as it should be. Look out for this push-rod! It is a snare and a delusion for the unwary.

CHINOOK.

A new method of denaturing spirit has been patented which has the advantage of being comparatively cheap. The denaturant, which is obtained from the distillation of turpentine, is specially suitable, as spirit treated with it possesses an extremely disagreeable smell and flavour, but is not so poisonous as spirit denatured with methyl-alcohol. The value of a satisfactory denaturing method is great, as it is a point which will influence the authorities in releasing alcohol for fuel purposes.



Ripon and District M.C.C.

This club restarts under healthy conditions, and there seems to be every prospect of future prosperity.

Widnes M.C.C.

The Widnes Club promises to be a great success; the membership is increasing every week. Local motor cyclists desiring to join a club should communicate with the hon. secretary, Mr. A. J. Bailey, 57, Regent Road, Widnes. The next run is on the 11th inst. to Blackpool.

Wallasey Motoring Club.

At a meeting held recently, the above club was formed, and the following officers elected: Hon. secretary, Mr. A. W. Garnett; hon. treasurer, Mr. J. Huntington; committee, Messrs. Hargreaves, H. Williams, and J. Jones. Local motor cyclists interested should communicate with the secretary.

North Birmingham A.C.

The above club will hold an opening meeting at 7.30 to-morrow (the 9th inst.) at the headquarters, Acorn Hotel, High Street, Erdington, and invites all motor cyclists and motorists who are interested to attend. A long programme of competitions and social events is to be discussed. Hon. sec., Mr. H. J. Moseley, 384, Slade Road, Erdington; assistant hon. sec., Mr. F. W. Thrush, 34, Reservoir Road, Erdington.

Luton and Beds. A.C.

The Luton and South Beds. A.C.C. has been revived under the name of the Luton and Beds. A.C., and the opening run will take place on Saturday the 17th May, starting at 2.30 p.m. from the Luton Town Hall. Any motor cycle and car owners in the district are cordially invited to attend. Full particulars can be obtained from the hon. secretary, Mr. Geoffrey S. Davison, 16, Bute Street, Luton.

Motor Cycling Club.

The M.C.C. is holding its first club competition—a speed-judging contest on Saturday next. There will be two classes, viz., for solo machines and passenger machines. The start will be made from a spot in the neighbourhood of Potters Bar at 3 p.m. A circular course of about five miles is to be covered three times. The first circuit at 16½ m.p.h., the second at 18½ m.p.h., the third at competitors' own choice of speed, not less than twelve nor more than twenty miles per hour. At the completion of the three laps competitors will state their chosen speed on a card (given to them prior to the event) and hand it to the timekeeper. Club prizes will be awarded to the best performances in each class, provided the entries are sufficient. The results will be announced at the Salisbury Hotel, Barnet, where it is hoped that arrangements will be made for tea.

Future Events.

May 9.—North Birmingham A.C. Opening Meeting, Acorn Hotel, Erdington, at 7.30 p.m.

May 9.—Bristol M.C.C. G.M., Grand Hotel, Broad St., Bristol, at 7 p.m.

May 10.—Bristol M.C.C. Rally.

May 10.—Exeter and District M.C.C. Opening Run.

May 10.—The M.C.C. Speed-judging Competition.

May 10.—Middlesbrough and District M.C. Run to Riccarton Abbey.

May 10.—N.M.C.F.U., Leeds. Run to Ilkley.

May 10.—Sheffield and Hallamshire M.C.C. Speed-judging Competition, Mam Tor.

May 10.—Wolverhampton M.C.C. Reliability Trial for the Corke Cup.

May 11.—Carlyle C. and M.C. (Chelsea). Run to Mersham.

May 11.—Eastern Counties M.C. Run to Southend.

May 11.—Ilkeston and District M.C.C. Run to Ollerton.

May 11.—N.M.C.F.U., Leeds. Run to Harrogate.

May 11.—N.M.C.F.U., Sheffield. Run to Dovedale.

May 11.—North Derbyshire M.C.C. Run to Castleton.

May 11.—Rochester, Chatham and District M.C. Run to Tunbridge Wells.

May 11.—Widnes M.C.C. Run to Blackpool.

May 13.—Oldham and District M.C. Hill-climb, Booth Dene.

May 14.—Middlesbrough and District M.C. Run to Stokesley and Saltburn.

May 15.—Tredegar and District M.C. Hill-climb at Fiddler's Elbow.

May 17-18.—Birmingham M.C.C. Weekend Touring Competition to Llangollen.

May 17.—Liverpool M.C. Social Run to Llangollen.

May 17.—Luton and Beds. A.C.—Opening Run.

May 17.—N.M.C.F.U., Leeds. Invitation Run to Keadby.

May 17.—Sutton Coldfield A.C. Half-day Trial for Levis Cup.

May 17.—Woolwich, Plumstead, and District M.C.C. Open Trial for Matchless Cup.

May 17.—York and District M.C. Paper-chase.

May 18.—Carlyle C. and M.C. (Chelsea). Run to Dorking.

May 18.—Eastern Counties M.C. Run to Bedford.

May 18.—Ilkeston and District M.C.C. Run to Surfleet.

May 18.—Woolwich, Plumstead and District M.C.C. Picnic Run to Limsfield.

May 21.—York and District M.C. Reliability Trial.

May 24.—Coventry and Warwickshire M.C. Manville Cup Trial.

Essex M.C.

It has now been decided definitely to run the speed trials at Southend, which will probably take place at the end of June. An open hill-climb is also being organised, as well as the usual twenty-four hour competition to York and back. Full particulars will be sent to members shortly. At Whitsun a midnight ride to Yarmouth will take place in the form of a competition.

Manchester M.C.

This club held a members' special general meeting at the Crown Hotel, Booth Street, Manchester, yesterday (Wednesday), to elect officers and committee, and arrange the full programme for 1919. Subscriptions for 1919 are now overdue, and should be paid to the hon. treasurer, Mr. G. B. Walker, 58, King Street, Manchester.

Birmingham M.C.C.

The Birmingham M.C.C.'s touring trial on the 17th and 18th inst. is now arranged, and the rules and regulations may be obtained from the hon. sec., Mr. W. H. Egginton, 76, Earlsbury Gardens, Birchfields, Birmingham. There will be two classes: A for solo machines above 300 c.c. and passenger machines above 499 c.c., and B solo below 301 c.c. and sidecars below 499 c.c. Four special awards are offered, and silver medals will be awarded to all who are not more than five minutes early or late at any check.

Tredegar and District M.C.

A meeting of the above club was held on the 28th ult., when it was decided that the first fixture should be a hill-climb. This will be held on the Fiddler's Elbow between Gwalion and Blaenavon, distance three miles, on Thursday, the 15th inst., at 3 p.m., in the following classes: Solo, 4 h.p. or over; solo, under 4 h.p.; sidecar, any h.p. touring models. There will be three prizes for each class, and the entrance fee for members will be 1s. and non-members 2s. 6d. for each event. Entries should be sent to Mr. E. W. Sutherby, hon. secretary, Whitehall Buildings, Tredegar.

Bristol M.C.C.

A very successful meeting was held at the headquarters, Grand Hotel, Broad Street, Bristol, on Tuesday of last week. Mr. Roderick Fry was unanimously re-elected president, Lieut. H. Smith secretary, and Mr. C. W. Rankin assistant secretary. The election of the other officers was deferred until the next meeting, which will take place at headquarters on the 9th inst. at 7 p.m.

It was decided to hold a "rally" on Saturday, the 10th inst., members to meet at the Lamb and Lark Hotel, Keynsham, at 3.30 p.m. All motor cyclists will be welcomed whether they are members or not. Members are specially invited to attend.



100,000 A WEEK.

"Ixion's" Comments upon "The Motor Cycle's" Record in Motor Journalism.

HAVING contributed to *The Motor Cycle* since it was little more than a four-page journal, chiefly adorned by photographs of the pacing motor cycles used for assisting push bicycle records on the Continent, I naturally take a special interest in our publishers' announcement that we have smashed all records for the motor press in reaching a weekly circulation of 100,000 copies. The significance of such a figure is not easily recognised. Until August, 1914, the man in the street used it as the mathematician uses *n* to express an inconceivably large number. Thus we were told in 1914 that 100,000 Russians had landed at Wick, and were detaining at Dover, while I am not at all sure that my maiden aunt had not sunk 100,000 Hun submarines before the first war Christmas. Since then, what with the Kaiser's original notions of indemnities and the paper army corps of the Russian steam roller, and the unemployment dole, and the number of Hun spies who have been shot in the Tower, a hundred million strikes us as a mere bagatelle. One hundred thousand—unless it has the mystic sign "£" in front of it—only sounds extraordinarily impressive to the men who know. Being a journalist of sorts, the analogy which best represents the immensity of the figures to me is a comparison with daily newspapers. Some years ago a cynic with a liver remarked that Lord Northcliffe first wooed fame by inventing the *Daily Mail* for people who could not think; and, sighing for fresh worlds to conquer, subsequently produced the *Daily Mirror* for people who could not read (I safeguard myself from a libel action by hastily adding that I never miss an issue of either paper). Obviously the proprietor who caters for such a public has a large number to draw on—Carlyle, at any rate, would say so. By comparison we of *The Motor Cycle* appeal to a very select circle; for, speaking epigrammatically, we chiefly address amateur mechanics with £100 or so to burn. Yet the *Daily Mail*, with its galaxy of super-men on the staff, covering every possible interest in this world and the next, can only sell an edition just ten times as big as our own; and the *Daily Mirror*, which goes further towards relieving you of any necessity for an imagination of your own, disposes of a beggarly 900,000 odd copies per diem. Journalists know what a 100,000 circulation means.

What 100,000 Means.

You, gentle reader, not being a journalist can hardly esteem us at our real worth, unless you chance to have been a railway or shipping magnate in August, 1914, or perchance a quartermaster of the brass hat class. In that case you had to collect just about 100,000 members of the original Expeditionary Force, together with their impedimenta, and hustle them over to France. That job unquestionably taught all the staff concerned what 100,000 means. Perchance

you "follow" professional soccer, as the saying is, and are accustomed to the leviathan gates which the modern gladiator attracts. If so, it is still long odds you have never seen 100,000 of your kind assembled simultaneously; for 40,000 is still a bumper gate at a Cup-tie. Perhaps I had better abandon the job of trying to make myself realise what 100,000 is—I have never possessed 100,000 of anything except influenza germs. In a few years, when we touch the 200,000 mark, my successor's task will be much easier. The figure will doubtless approximate to the r.p.m. of Granville Bradshaw's latest engine, or to the mileage of one of F. L. Rapson's unpuncturable tyres, or the Triumph weekly output, or the Douglas speed in m.p.h. for a flying start mile at Brooklands.

In the Dark Days.

Joking apart, those of us who have fought the long battle have lived enviable years. We can remember days when our pages were hard to fill and harder to sell. Now we know what it is to reject lots of interesting copy, and even—in war-time—to repress an over-robust circulation because our paper ration would not run to it. We have seen punny little foreign engines of extraordinary capriciousness gummed to the down tubes of ridiculously bad British frames, and disfigured by incredibly silly transmissions. By trial and error, by research and experiment, by pluck, brains and energy, we have seen British motor cycles climb slowly to the very top of their industrial tree, and even threaten ethereal ideals. In the dark days of the industry other journals have gone under, but we have never missed a week. Over and above the material rewards of our present position we have three abiding memories to treasure. In so far as a journal can play a part in fostering and developing an industry, we can claim to have done yeoman service to maker, trader, and user alike. Our belief in the future of a machine which was once deservedly despised and mocked at has been more than approved by facts and history. Last, but not least, our bulging mailbags bring us quiet meeds of appreciation from all manner of men (and even women) in all the corners of the earth—from the tropics to the sub-Arctic regions.

One last word. When this paper was founded there was no motor cycling community. This country boasted nothing more than a handful of isolated enthusiasts, pursuing a strange and unpopular pastime. To-day the pastime has created a special community of enthusiasts within the bigger community of the State; indeed, it is an international community—as international as science, or finance, or Esperanto. As this journal has played its part in creating that community, so it still works to link its members together: and we of the staff are proud to share in the resultant freemasonry.

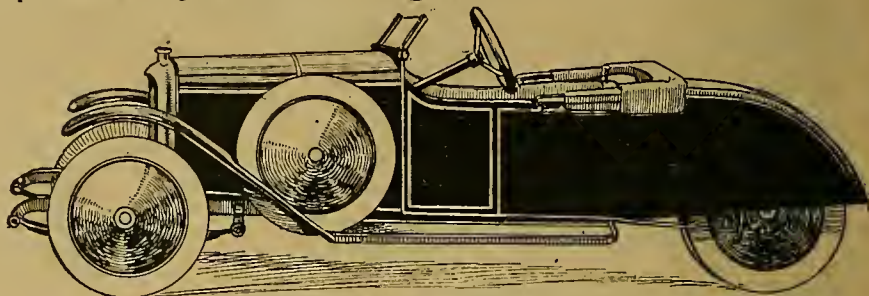
A Three-wheeler with Twin Rear Tyres.

New Runabout produced by a North of England Concern.

RUNABOUTS have come to be regarded as the real stepping stone between the sidecar and the car, and before the end of the year it is probable that several new machines of this type will be on the market.

Not the least interesting among these new runabouts is the M.B., made by the Premier Motor Co., of Bolton. It has an 85x85 mm. 961 c.c. water-cooled J.A.P. engine, flat plate clutch, two speeds and reverse gear box, with central gear change, shaft drive to gear box, hence by single chain, pressed steel frame, Dunlop pressed steel spoke wheels, and 650x65 tyres.

The rear wheel is somewhat unusual, twin tyres being mounted on independent wheels which are so arranged that they are built up into a single wheel.



The M.B. three-wheeled runabout.

A spare wheel is carried on the forward end of the left running board, which makes up the tyre equipment to five tyres—the same as on a light car.

Semi-elliptic springs are used at the

front and quarter-elliptic at the rear and the steering is by drum and steel cables. Complete with spare wheel and tyre, lamps, horn, jack, and tools, the price is £215.

The London-Edinburgh Run.

A Popular Whitsuntide Event that attracts Entries from Many Parts of the Kingdom.
Army and Navy well Represented.

THE rules and regulations of the twelfth annual club run of the Motor Cycling Club from London to Edinburgh have now been published. The start will take place as usual from the Old Gate House Hotel at the top of Highgate Hill on the evening of Friday, June 6th, at five o'clock. All competing motor cycles must be at the starting place at 7.30, and drivers must sign the checking sheet not later than 8 p.m. The vehicles will be started in the following order: first motor bicycles, then sidecar machines, then cycle cars, and finally cars. The actual order of starting will be determined by ballot. No driver will be allowed to leave any control before his schedule time. All motor cycles and other vehicles must be driven throughout the entire run

by the member entering, and members must accomplish the journey unaided by attendants riding on the machines or by organised assistance in any form. Under no circumstances may a passenger be seated on the carrier.

A gold medal will be awarded to every entrant reaching Edinburgh in 23 hours from the time of starting; a silver medal to an entrant finishing within 24 hours, and a bronze medal will be awarded to every entrant whose time exceeds 24 hours but who reaches Edinburgh within 30 hours. Entrants may not be at any place or time more than 15 minutes ahead of schedule, nor may entrants qualifying for gold medals be found at any place or time more than 30 minutes behind schedule.

Sidecars and cars must carry a passenger.

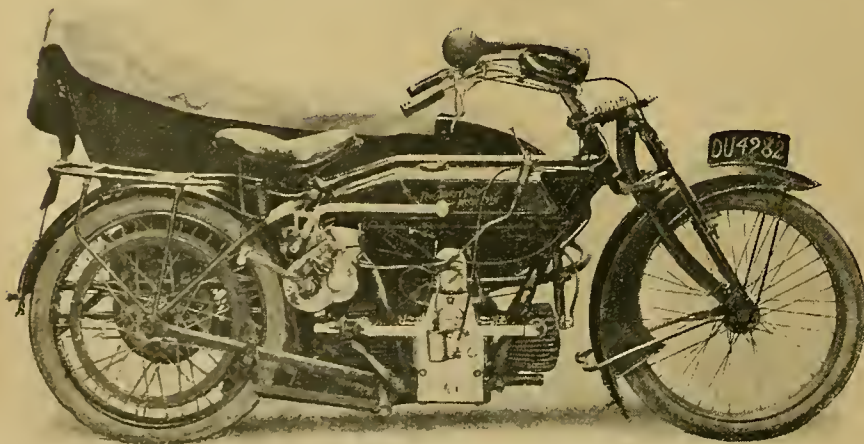
Applications to compete have been received from as far north as Fife, Carlisle, Newcastle, Warrington, etc., and the Services will be well represented. One entrant is a lieutenant in the Brazilian Navy.

The entry fee for all vehicles is £1 1s. No trade numbers will be allowed, nor any advertising device, other than the makers' standard transfer. All entries and entry fees must be sent to the trials honorary secretary, Lt. W. Cooper, R.A.S.C., M.T. Co., Claydon, Suffolk, before the 20th inst.

Lieut. W. Cooper will be pleased to hear from any motor cyclists who are willing to assist the committee by acting as marshals and checkers.

“Up and Down” Drive on Demonstration Machine.

One Way of reducing Wheelbase on Medium Sized Flat Twins.



IN order to demonstrate the 5-7 h.p. Victor flat twin engine unit which the Coventry Victor Motor Co., Ltd., are offering to the assembling trade, the makers have fitted it into a short wheelbase frame which has necessitated placing the gear box in an unconventional position.

As will be seen from the illustration given here, the gear unit is located above the rear cylinder in a position under the saddle. Thus the drive roughly follows two sides of a triangle.

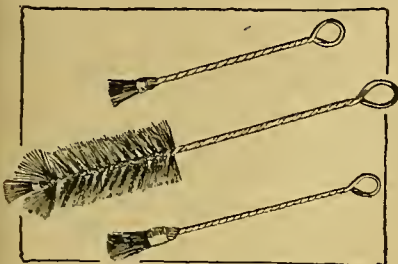
It may be remembered we described this engine (which has a bore and stroke of 75 mm. and 78 mm. respectively, giving 688 c.c. capacity) in our issue for December 12th, 1918.

We understand that several prospective manufacturers of light runabouts are interested, and that deliveries of this engine have now commenced. In a very short time the output facilities will be sufficient for 100 engines per week.

The Coventry Victor flat twin in a demonstration frame. Note the unusual position of gear box

THREE USEFUL CLEANING BRUSHES.

WE have received three samples of cleaning brushes from Mr. T. Coltman, 2, Providence Place, Laisterdyke, Bradford, which should be very useful in cleaning the various parts of motor bicycles. The engine



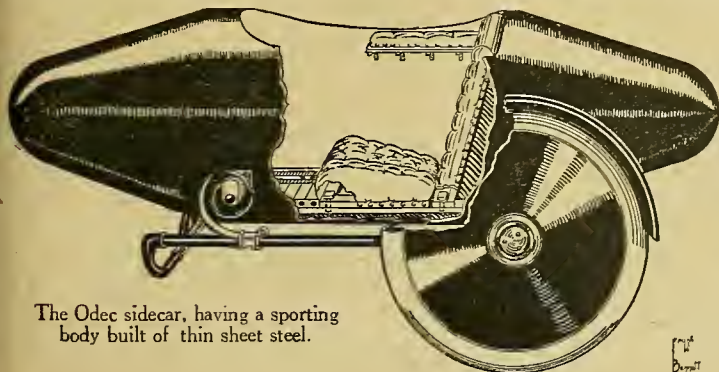
A useful set of cleaning brushes.

cleaning brushes are of distinctly good design, because the wires securing the bristles do not bulge out, as is often the case, and therefore allow the brush to reach inaccessible parts. The spoke brush shown is of a size rather too large for motor bicycles, but a smaller size is manufactured, and will be ready for delivery by the time these notes appear.

TORPEDO SIDECAR BUILT OF STEEL.

STEEL for the building of sidecar bodies does not, on casual consideration, appear to be a material particularly suitable for the construction of light sidecars, but quite a number of firms are now using it with considerable success. The difference in weight, however, between a body built of three-ply wood and thin sheet metal is not so great as one would imagine, and if any disadvantage does exist on the score of weight when steel is used it is counterbalanced by gain in durability and strength.

Newcomers to the manufacture of sidecars, who evidently believe in material more durable than wood, are Messrs. the O. N. Davis Engineering Co., Ltd., Queensland Road, Holloway, London, N.7, who are introducing the Odec sidecar, which has a torpedo-shaped steel body built on "sporting" lines. The backrest is constructed to allow for removal,



The Odec sidecar, having a sporting body built of thin sheet steel.

giving access to a receptacle at the back suitable for the storage of petrol tins and luggage, whilst the seat itself is adjustable.

The chassis construction is to be of a very light character, and the complete sidecar will be quite suitable for attaching to lightweight machines. Suspension in front is by spiral springs, and at the rear by C springs, the upper ends of which are attached to the body through a double shackle.

Although designed as a sporting sidecar, this model is not particularly low in build, and permits of easy conversation between passenger and driver. The makers intend to manufacture several types of sidecar, and are making arrangements to place large quantities on the market within a short time.

READERS' ROAD REPORTS

THE following are culled from this week's mail bag of readers' road reports:

Chester to Llandudno, *via* Connah's Quay, Queensferry, Abergyle, and Colwyn Bay.—Very bad to Abergyle, but much better after.

The Great North Road (south of Doncaster to London).—With the exception of a mile near Rossington Bridge (three miles from Doncaster), good. From Doncaster to Ollerton and Nottingham, very good condition generally.

The best way to reach North Wales is *via* Wrexham, Mold, and St. Asaph, which was in excellent condition a few weeks ago. The road *via* Welshpool and Dinas Mawddwy is by far the best way of reaching Dolgelly and Barmouth.

Liverpool to St. Helens, *via* Prescott.—Very bad all the way.

Sidcup (Kent) to Hazlemere (Bucks), *via* London.—Sidcup to New Eltham fair, had in patches. New Eltham to Eltham bad. Through Eltham to Lee good. Lee to Lewisham fair. New Cross through Old Kent Road to Westminster Bridge very bad. Over Westminster Bridge fair. Victoria Street bad in patches. Victoria to Gunnersbury Lane, Chiswick, good. Through Gunnersbury Lane to Uxbridge Road, Ealing Common, fair. Ealing Common to Hanwell fair. Hanwell to Southall very bad. Through Southall wood paving good. Southall to Uxbridge bad. Through Uxbridge wood paving good. Uxbridge to Gerrard's Cross very bad. Gerrard's Cross to Beaconsfield had, except one or two short stretches before getting to Beacons-

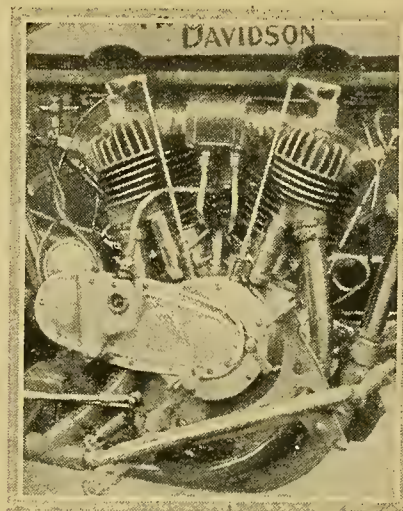
field. Through Beaconsfield good. Beaconsfield to Penn very fair. Penn to Hazlemere good.

Between Tring Station and Tring Town the first half-mile is good but the next mile is very bad indeed, so that a motor cyclist is apt to drive too quickly over the first portion of the journey and strike the second portion too fast.

Between Edgware and Stanmore, after leaving the tramlines, the road is bad the whole way to the latter village.

IMPROVING THE MAKER'S DESIGN.

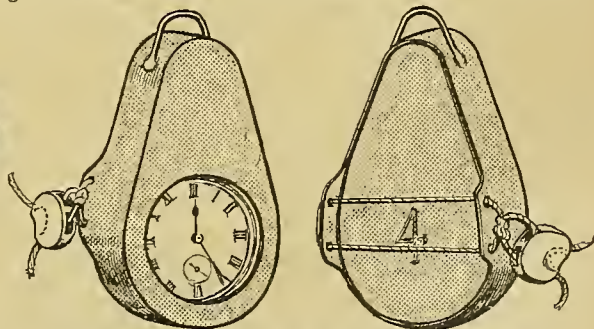
USUALLY when a motor cyclist fits such a thing as a vaporiser to his machine, the general appearance of the machine is not enhanced, and sometimes such devices are clumsily and roughly made. But the owner of the Harley-Davidson illustrated here—Mr. Bateman,



A vaporiser which improved the running of a Harley-Davidson on heavy fuels.

of Coventry—is a mechanic, and the hot air muff shown is well made and highly finished. In fact the whole of the machine is an example of how a machine should be kept.

The vaporiser takes hot air from both exhaust pipes, to which it is connected by two copper pipes, the whole being plated and polished.



Watch cases of the design shown above are used by the Cork and District Motor Cycle Club on their reliability trials. Pliers with a changeable design are used for closing the seal.



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Herford Street, Coventry, and must be accompanied by the writer's name and address.

SCOTTISH FERRIES.

Sir,—Can you or perhaps one of your Scottish readers inform me if there is any trouble about getting a motor bicycle across the Forth from Granton to Burntisland? It looks so beautifully simple on the map that I feel sure there is a catch in it somewhere. Are motor bicycles carried on the ferry, and, if so, are there any humbugging regulations about carrying petrol, or anything of that sort?

Also, are the Highlands of Scotland now open for tourist traffic?
Sheffield. W 5124.

DIFFICULT STARTING.

Sir,—There have been so many complaints lately in *The Motor Cycle* about difficult starting that a hint which I saw given in an old number of *The Motor Cycle* might be worth repeating. It is to *heat the petrol*.

I had great trouble with my own machine lately in this respect, and so now I just put my petrol squirt (which is full of petrol, of course) into an old jar full of hot water, and inject some of this hot petrol into the cylinder; or, if this does not do at once, into the plug, and this sets the "jigger" off first push.
Tynemouth.

EXPERIENCE.

LOSING ONE'S PROP.

Sir,—It is kind of "Torque" to suggest to me the Socratic method of arriving at the truth. It reminds me of his magnanimous offer *re* handsome wreath. But as an evasion it is not so skilful, for Socrates never wandered from the point, possibly because, unlike "Torque," he never found himself in chancery.

Why does not "Torque" say that he gives up as a bad job further attempts to evade a direct answer to my question, instead of saying that he gives me up as a bad job?

His letter of May 1st marks the second time that he has parried my demand for chapter and verse with a counter question, and, for the second time, I will answer him.

Where "Torque," to use an R.A.F. colloquialism, "slips up" is with reference to question No. 1 of the Socratic dialogue, Does a lost prop remain *stationary* during a dive at 100 m.p.h., A.S.? Granting, under protest, that 100 m.p.h. air speed is a dive, the answer is in the affirmative, with the reservation that under abnormal conditions the prop might make a partial revolution, which would, however, be insufficient to start the engine.

Answering question No. 2, If so, why? the compression in a normal stationary aero engine is such as to prevent mere "friction of the air on the propeller" ("Torque's" phrase) from turning the engine over compression with the jerk necessary to secure an explosion.
REVS.

Sir,—As a reader of *The Motor Cycle* I have noticed from time to time certain correspondence therein dealing with aeronautics by "Revs," "Torque," "Spark Plug," etc., who appear to have some knowledge of the subject. At the same time I do not see the connection between this subject and motor cycling. However, I should like to point out that "Spark Plug" is wrong in stating that he does not think a Siddeley Puma engine could be started by diving the machine. If this had been true my machine and I might have found a landing ground on the top of Manchester Cathedral. For, whilst on a certain occasion I was testing a new machine fitted with a Siddeley Puma engine, I was so unfortunate as to lose my propeller at a height of 2,600ft. over the centre of Manchester, and regained it after a

dive down to 900ft. (heights approximate). I may say at the time I forgot I had wings or tail plane to drop off, but I could not have cleared the city otherwise. The engine had the usual two-bladed propeller. This, I think, proves that a Siddeley Puma 230 b.h.p. can be started by diving the machine.
CONTACT.

Accrington.

[This correspondence must now close.—ED.]

THE NEW A.B.C.

Sir,—I have been much interested in the letters, etc., *re* the new 3 h.p. A.B.C., and was hoping to see some sort of answer to "A.D. 3744's" letter, which appeared in *The Motor Cycle* of April 24th, but I was disappointed to find no reference to it in *The Motor Cycle* for May 1st.

I think he gives a wrong impression in his sketch, which gives the idea that the spring is of the form of a beam fixed at one end and pin-jointed at the other (front) end, whereas it is a beam fixed at both ends and with the point of contraflexure approximately at the centre. I may be wrong, but the rear springing appears to me to be designed (not cribbed) perfectly, *i.e.*, in a proper scientific way, and for this reason I do not see how anything much can "happen" after "n" hundred miles. Some motor cycles I have seen give the impression that if one were to ask the designer (so-called) what relation shear has to bending moment he would just gape and wonder what one was talking about. The A.B.C. does not give me that impression, and I should like to add that I have nothing whatever to do with the firm except as a "longing to be customer."
Colchester.

DON PIP.

FOUR-CYLINDER MOTOR CYCLES.

Sir,—I have noticed that several of your correspondents ask when we shall get a good British four-cylinder machine. I take it that the Ogston Co. will continue the manufacture of the T.M.C. very shortly. I have driven one of these machines hard for nearly three years, and have nothing but praise for it. The only mechanical troubles I have had are, first, the brass gear wheels of the water pump wearing out, and secondly, the breakage of a rear spring on the sidecar side of the machine. The machine is a pleasure to handle, the workmanship excellent, the material of the best, and, with a No. 22 Zenith carburetter, I get 60 m.p.g. and a true tick over in neutral. I have driven exactly 20,000 miles, and have just ground in my valves for the second time, and the condition of the exhaust valves was very good, not a trace of pitting. I have covered in my valves, and the machine is now practically noiseless except for the purr of the exhaust. The starting, even on present-day petrol, comes at the second turn over, without injection, even in the coldest weather. I do not know of any machine other than the T.M.C. that can pull a sidecar and passenger at as low a speed as 8 m.p.h. on a $3\frac{1}{2}$ to 1 top speed. The first speed is only $7\frac{1}{2}$ to 1, and my combination is a heavy one, but I can take any hill I have come across in Kent on second speed— $5\frac{1}{2}$ to 1. The back wheel can be retired without taking it out in less than five minutes—as quickly, in fact, as any machine with detachable back wheel—or the back wheel can be taken out and replaced in ten minutes easily.

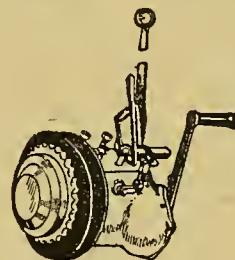
I have no interest in the Ogston Co. commercially, but I am anxiously awaiting their next model. The only improvements I can suggest to them are (a) gear drive for the oil and water circulating pumps; (b) Zenith carburetter with accelerator pedal as standard—the pulling power with this instrument at low speeds on top gear is phenomenal.

E. W. KIDDELL.

STURMEY-ARCHER

The SturmeY Archer went over the water with the first of the "Old Contemptibles." It "stuck it" on every front through the whole four and a half years of war. Now it has been demobilised and has resumed civilian service. It is at your service now, and if you want to know the service the SturmeY Archer gives ask any soldier. We will leave it at that.

The STURMEY ARCHER COUNTERSHAFT GEAR will be the mark of all good post-war motor cycles; see that you have it fitted to yours. It makes just all the difference between pleasant motor cycling and—the other thing.



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FIELD TELEPHONES FOR MOTOR CYCLE HILL-CLIMBS.

Sir,—It has occurred to me that the authorities must have a large quantity of field telephones, cable, etc., which is of no further use to them, but which would be a great boon to motor cycle clubs to enable them to rig up electrical timing apparatus for use at hill-climbs, speed tests, etc.

We have a large number of members already demobilised, who would be quite competent to lay and work such apparatus, and doubtless most other clubs are in a similar position.

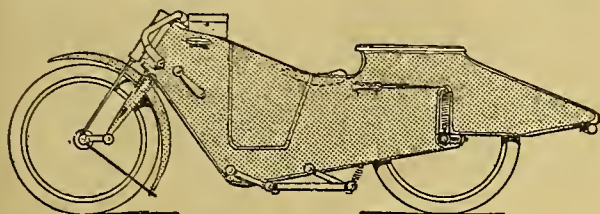
I need hardly add that the very fine part taken by motor cyclists in the war entitles them to special consideration in this matter. Perhaps you would be able to do something for us and other clubs who are anxious to run their events under the best possible conditions.

RONALD S. RUSSELL,

Hon. Secretary Cork and District M.C.C.

PRESSED STEEL FRAMES.

Sir,—I have taken your paper for the last six years, and have noticed very few suggestions for pressed steel frames. I enclose a rough sketch of what I think is an ideal pressed



Suggested pressed steel frame by Pte. R. M. Smith.

steel frame. The only drawback is that the rider's feet are inside the body, but this might be overcome by fitting a stand worked by a lever, so as to keep the machine upright when it stops. The saddle is shown by a dotted line. T.T. bars should be fitted, so as to obtain a better balance.

B.E.F.

R. M. SMITH (Pte.).

SPARE PARTS.

Sir,—As an ardent reader of *The Motor Cycle*, I feel I should like to express my entire agreement with your article in the issue of April 10th concerning spare parts.

I ordered new piston rings and gudgeon pins on March 21st. On March 30th I wrote to the makers of my engine, asking them to send me an invoice as soon as possible, so as not unduly to delay the despatch of parts. They wrote acknowledging my order of March 8th (*sic*). I then telephoned through to them at the expense of three calls, and after being shunted from department to department (and to each of which I had to go through the whole story), I finally reached some part of the factory where my order was recollected. They could not understand the delay, and promised immediate despatch on receiving remittance, the amount of which I then learnt for the first time. I told them the cheque was being posted, and to send the goods when received. I also told them not to hold up the goods if they found that their estimate was 1½d. more than they told me. They said they would not. Three days later they acknowledged my cheque, but required a further amount owing to their miscalculation of costs, and said they would then send the parts *as soon as possible*, i.e., probably three or four more weeks at the earliest. Cannot I do anything?

It amazes me that a firm of their size should keep their correspondence in such a hopeless muddle, and be generally about as disobliging as it is possible to be. I feel I would much rather satisfy my feelings on this firm than get the parts now.

P. DE R. MASON.

Sir,—Not the least pleasing feature of your excellent journal of April 10th is your reference to spare parts.

My experience will perhaps, in the light of that article, be of interest. I have a 1913 4½ h.p. combination, and last November my agents, Messrs. Wauchope, of Shoe Lane, Fleet Street, sent to the makers on my behalf, asking to be provided with second-speed gear wheels for main and layshaft.

No notice was taken of the order for some weeks, when it was repeated, and receipt acknowledged.

Another application later elicited the fact that the parts required were in the hardening shop, and would be sent along soon. Still nothing happened. Then I wrote myself, quoting their reference, asking them to speed up delivery.

I had a reply stating that the order referred to could not be traced: "please let us know what you want and we will send it along." I then went to Messrs. Wauchope and complained that they had not apparently ordered the parts required, and I was shown a whole pile of correspondence relating to the matter.

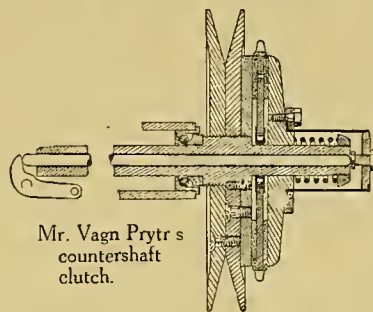
I again wrote, quoting some of their letters to Messrs. Wauchope, and received a postcard in reply, regretting inability to supply my requirements quickly owing to shortage of material and labour troubles. (All this after the parts had been in the hardening shop for about ten weeks.) Again I wrote, asking them to explain the discrepancy between the letters I had and those sent to my agents, but up to the present have not been favoured with a reply, neither have I received the parts, and my outfit is still lying idle. Nearly five months have elapsed since the order was placed, and I do not as yet know whether they are going to supply me or not. If they would tell me that they cannot worry over spares, then I should know what to do.

W. A. HILL.

A HOME-MADE CLUTCH.

Sir,—In a recent issue of *The Motor Cycle* I see that Mr. R. L. Boyd asks for details of a home-made clutch on a countershaft mounted in the pedal bracket. As I have made such a device, I send a sketch, which I hope will be of some interest to your readers.

The axle is a piece of mild steel with 3% carbon; it is bored through with an 8 mm. hole (I think 7 mm. is large enough). The ball bearing cone is a piece of tool steel, hardened and ground, and screwed up tightly against the shoulder.



Mr. Vagn Prytz's
countershaft
clutch.

The belt pulley is made of two discs of mild steel, 8in. diameter, turned all over, so that the angle is exactly 23°.

The chain wheel is from

an old bicycle. It has nineteen teeth for chain, 1in. pitch and ½in. wide. (It ought to be ½in. or ¾in. pitch, but I could not get such a wheel.) The chain wheel on the engine has ten teeth.

I cut all the ribs out of the large chain wheel, and brazed on a disc; to this is fastened two pieces of Raybestos or Ferodo lining. The disc runs on a roller bearing, as shown. The pulley and distance piece are secured to the axle by a key screw, while the outer piece of the clutch slides on the axle with two keys, which are soldered on to the axle.

The spring is an old saddle spring. The clutch is not fitted with a kick starter, as my engine is only 2½ h.p.

I have not yet tried the clutch with the engine running, but I hope to do so shortly.

VAGN PRYTZ.

Hellesup, Denmark.

OBTURATOR RINGS.

Sir,—The statement by Engineering and Arc Lamps, Ltd., re the considerable development of obturators during the war is, to my mind, very misleading. From my experience the development, if it may be so called, has been no more than "very moderate"; in fact, since about the middle of 1916, I have noticed a considerable deterioration in the efficiency of the few thousand obturators which have passed through my hands during the war. Far from the obturator giving no trouble, it is the constant source of the necessity for the overhaul of such engines as the Clerget, Monosoupape, and Gnome.

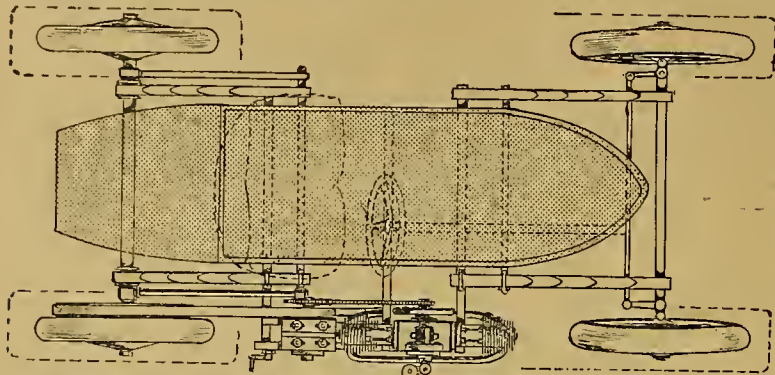
With regard to the citation of an actual flying life of 250 hours, well—the least I can say is, that 120 hours, such as I have known odd sets to run, is beyond the wildest dreams of imagination of the overworked R.A.F. mechanic, or the average pilot. My own statement as above (120 hours) has been discredited by pilots of considerable ex-

perience and position, even when backed up by log book entries. The most common trouble with the obturator is breakage at the "lip," and burning of the ends, either of which invariably causes about £30 worth of damage to the average rotary engine. Finally, I would add that the efficiency or otherwise of the obturator resolves itself in the main to a metallurgic problem. The perfection of this type of ring will be yet another triumph of those practised in the art of metallurgy.

EX-TECH. SERGT.-MAJOR, R.F.C. and R.A.F.

A SIMPLE CYCLE CAR.

Sir,—“Chinook's” article published in *The Motor Cycle* recently on the cycle car is very true. There is a big



A suggested cycle car on the lines of the Chater-Lea machine produced several years ago.

future for it if only the right sort could be produced. I have been riding a flat twin 500 c.c. Brough for the last 4½ years and have got the idea that the flat twin would be an ideal engine for a small light cycle car.

I am sending you a rough sketch not exactly to scale, but approximately proportionate. It seems to me that an extremely simple runabout could be made with the engine unit together with the gear box, that would be easily detachable and very accessible, and do away with the motor cycle frame. All it would require would be a simple chassis about 5ft. long by 2ft. wide, with three cross stays to take the engine and gear box, with quarter-elliptic springs back and front to axles.

The Sturmey-Archer countershaft gear is very suitable with its hand controlled clutch and easily operated gears.

Bakewell.

W.A.M.

STARTING TIPS.

Sir,—I have noticed sundry references to difficult starting on war spirit recently. As one who has been privileged (!) to ride all through the restrictions, perhaps you will allow me to make a few suggestions. First, with everything cold, it is impossible to get A1 starting with C3 spirit. I do not think much of the hoary tip of pouring a kettleful of boiling water over the carburettor stub; it is messy, and, with inlet pipes swathed with insulating tape, etc., against air leaks, impracticable. But many people do not mind a little trouble if they can ensure an easy start after it. So I suggest taking out the plug—in the case of a twin one is enough—and doping liberally through the plug hole. Then put the plug on a gas ring, or the bars of a fire grate, for a few minutes, or till it is too hot to handle with bare fingers; then replace and start immediately. I have found this method infallible. It sounds wasteful of time, but the plug can be heating while one is putting on overalls, etc. A simpler method which is effective on less cold days is to put the petrol squirt into a cup of hot water before doping. This is one of the simplest tips, but surprisingly few people seem to know it. In the case of stops up to an hour in length the machine, if possible, should be put up out of a draught, as it will retain sufficient warmth to get an easy start, but if in the slightest draught it will get stone cold in a very short time. Reverting to the plug heating, a porcelain insulated plug will not stand up to it. I have ruined several, but an old single-point steatite Sphinx has stood up to the treatment for two years, and is still sparking as well as ever, nor have I yet succeeded in destroying a Lodge Aero in this way. Usual disclaimer.

(REV.) J. M. PHILPOTT.

MOTOR CYCLE IMPROVEMENTS.

Sir,—Having had experience of belts that slip badly in wet weather and pull through, usually going up hills, also of chains that collect filth, stretch and snap, might I suggest that makers of motor cycles should turn their attention to a better system of transmission from the engine to the road wheels, particularly in the case of sidecar combinations.

The ideal system to my mind is a shaft drive (bevel gear, not worm). Many years ago cars were fitted with chain drive, and the fact that this system has been almost completely scrapped should set motor cycle makers thinking.

A previous correspondent has written on the subject of noisy exhaust and infernal clatter from valve tappets, making conversation with the sidecar passenger almost impossible.

Unfortunately I am not in a financial position to set about making what I consider to be the ideal sidecar machine, but I feel sure that the manufacturer who built a motor cycle with bevel shaft drive and a miniature “silent Knight” engine would find an immense market for his production from people who want a “no trouble” sidecar combination.

Finally, I cannot understand why firms still persist in putting the flywheel inside the crank case in view of the loss of power caused by the wheel having to churn round in a viscous sea of thick lubricant. The well-known Douglas and the new Blackburne model mark steps in the right direction, though at the same time I consider that all outside flywheels should be enclosed in a case to prevent oil slinging should the lubricant leak through on to the flywheel, and to prevent accident in the event of the flywheel bursting at excessively high speed.

Isleworth.

E.G.H.

THE RULE OF THE ROAD.

Sir,—If you can spare the space, I should like to give a word of warning to riders, both of motors and cycles; in fact, to all users of the road to exercise the greatest care during the period the Overseas service men are coming back into civil life. They have been used to the Continental rule of the road in a great many cases, and accidents are liable to be caused by their forgetting our customs when they first come home. This is not theoretical, as I had a collision, while riding a motor cycle, with a pedal cyclist just recently. The road was otherwise deserted and quite clear, and each in full view of the other, and although the cyclist was nearer his wrong side than the centre of the road he never thought of stopping, and when quite close he cut in to his right. I jammed down the brake, but was too late to avoid him. Fortunately, damage was very little in either case, and he explained his conduct by saying he was only a few days home from France, where they kept to the right. I hope this may serve its purpose, as a warning to others who might have a similar experience, as accidents are never pleasant, to say the least.

W. H. JAMESON.

MAPS FOR MOTOR CYCLISTS

"THE MOTOR CYCLE" ROAD MAPS.	Price.	Post free.
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SPRINGING THE MACHINE.

A Few "Armchair" Notes on an Engrossing Subject.

A FOREWORD may be said on the subject of springing generally. Although it is not possible to have too comfortable a machine, there are limits to the extra expense and weight of springing beyond which it would not seem worth while to go. To judge from the numerous letters one reads, it would be gathered that it is an everyday performance for each motor cyclist to climb, say, the Himalayas, or to ride up an ancient river bed, or over railway sleepers two or three inches above the permanent way. Granted there are motor cyclists who do these things, some from choice and some from necessity. If they are in sufficient numbers to warrant it, by all means let them have a machine suitable for the work. But let it be a distinct model, so that we may retain our own mediumweight English machine. We do not need river bed models. Further, it ought to be our endeavour to make every road suitable for any machine to ride on rather than to make every machine suitable for riding on any road—or apology for a road.

Perfect Roads or Perfect Springing?

The absolute "go-anywhere" machine tends to become an obsession. A lesson might be learnt from experience in France, where for riding over canal beds, ditches, dykes and trenches, tanks were used and not motor cycles. Perhaps, now that the super-organisers are seriously at work there may be something done in the way of segregation of road traffic. It is not a very brain-fatiguing matter to imagine some of the saving this would effect both to the road authorities and to the owners of vehicles. Every bad road means the expenditure of pounds in weight and in cash more than should be necessary for motor users.

Perfect roads and perfect springing are inevitably correlated. Both are ideals which will never be fully realised. As the cynic may say, "The advent of the perfectly sprung machine will only occur in the era of perfect roads, and that will be when there is no man left to ride on them."

The following notes are intended principally for the general reader who is fond of pursuing, in the

armchair as well as on the road, problems relating to the motor cycle.

The study of springing systems is of the most absorbing interest, whether taken analytically or synthetically, whether you amuse yourself by pulling to pieces systems already designed, or occupy yourself in building one up according to your own theories.

Interest never palls, and the game is never finished. You or somebody else will find objections to any system of springing you can devise. In time the subject begins to have an attraction something like that which the question of

perpetual motion or of squaring the circle had for the philosophers of old. A proof of this may be found in the scores of patents which have been taken out for spring forks during the past dozen years, and for rear springing systems in more recent times.

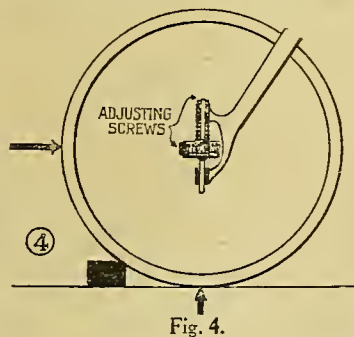
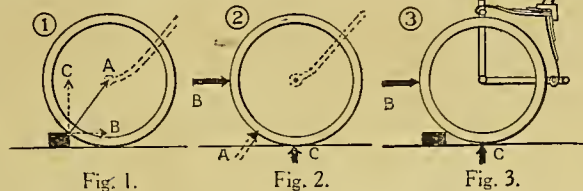
Explanation of Diagrams.

Fig. 1 shows a wheel meeting an object on the ground. The line A represents the force set up on impact. This force can be resolved into the two forces B and C. In other words, if the two forces B and C acted as shown in fig. 2, they would have exactly the same result as the single force A. Further, if we balance, or, in the case of springing, "cushion," each of the two forces B and C, we have in effect "cushioned" force A. We may say, then, that any force acting on the wheel to cause a shock may be replaced by imaginary forces acting (1) parallel to the ground, or (2) at right angles to the ground. If arrangements of coils, air springs, or leaf springs are provided to allow these forces to be gradually, instead of suddenly, dissipated, then the wheel is satisfactorily sprung. If both wheels of a machine

are satisfactorily sprung, then the whole machine is satisfactorily sprung. Figs. 3 and 4 show theoretically correct designs for springing a single wheel.

Some of the reasons why practical designs cannot readily be arranged to give theoretically perfect springing are:

(1.) The need of lateral strength, so that there may be no side-play.



Springing the Machine.—

(2.) The fact that brakes are fixed on wheels and a wheel must be rigid, or practically rigid, in the direction in which the brake acts.

(3.) The back wheel takes the drive; here again the wheel must be practically rigid in a line joining the wheel centre and the engine (or countershaft) centre.

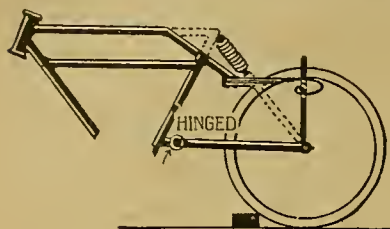


Fig. 5.

Because of having to take these things into consideration, most types of spring forks are rigid in one

direction, generally in the direction of the horizontal force B. Others are made to cushion first one force and then the other (not the two simultaneously), with the result that there is a movement of the fork first backwards and then forwards, reversals of movements continually taking place as the springing arrangements are performing their functions.

No types of front forks are shown. Examples of these can be found in any issue of *The Motor Cycle* and analysed by the reader for himself.

Rear Springing.

In rear springing, attention may be drawn to the fact that a machine may be quite suitably sprung for solo work and yet not for sidecar work. Also, a springing system which might be all that was desired for a lightweight might not fill the bill for a heavy-weight. Consequently, for rear springing work it would seem probable that a number of systems will be necessary, or sacrifices have to be made in certain directions.

Most methods of rear springing are variations of the methods indicated in fig. 5, the two examples shown lending themselves to illustration of what may be called the hinged back wheel method. The objects

aimed at in the different variations are to make the frame as strong laterally and as free from whippiness as possible; also to arrange the hinge so that there is as little alteration in chain or belt tension as possible when the springing device is in operation. Considering the last-mentioned point, it is obvious that the best form of rear springing would be realisable in a machine having a flexible shaft drive.

A Concrete Example.

The importance of strength in the different parts of a springing system may be shown by a few simple figures.

Suppose the weight of a machine and rider to be 360 lb. and that two-thirds of this weight is taken by the back wheel and one-third by the front. When the machine is travelling at the *slowest* speed it is possible to pass over an object such as is shown in the diagrams, the resultant upward force C will be:

For front wheel slightly greater than 120 lb.

For back wheel slightly greater than 240 lb.

That the force C will be much greater for higher speeds is evident, and the danger of incurring a fracture is augmented by the application of the force being almost instantaneous instead of what may be termed gradual, as at slow speeds. Consequently, it will be realised that special care must be exercised in providing the necessary strength of springs, links, etc., and in designing a springing system for machines that are expected to maintain a *high speed over rough roads*. In example fig. 6 the engine is not sprung, but the arrangement gives very good insulation from road shock for the rider, and is very suitable for solo and lightweight work.

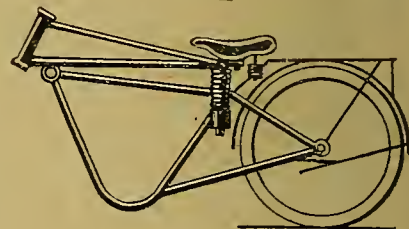
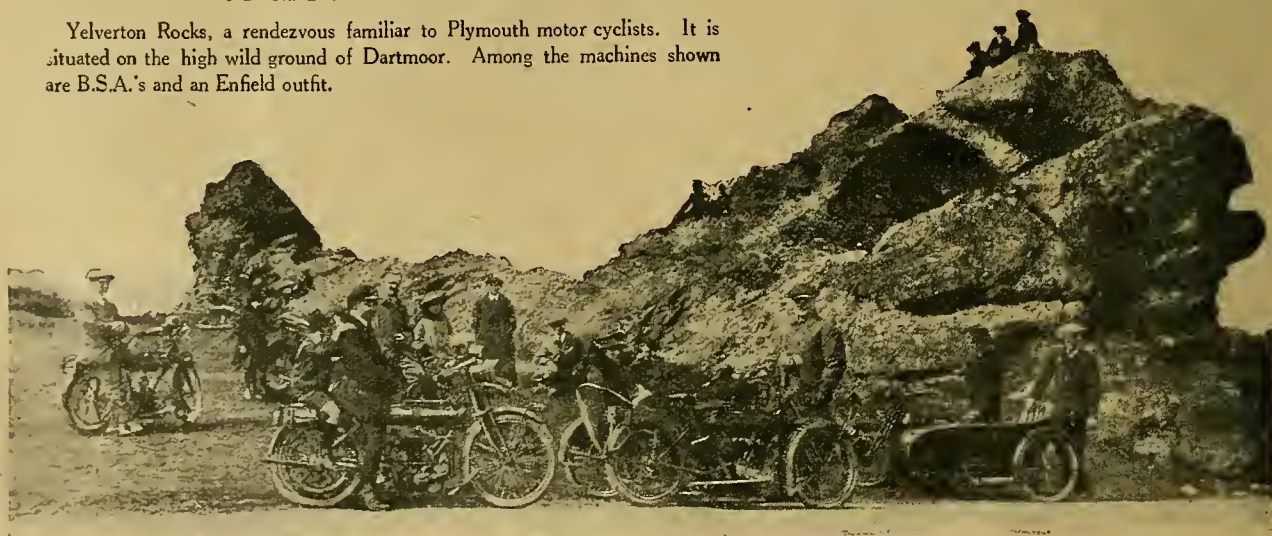


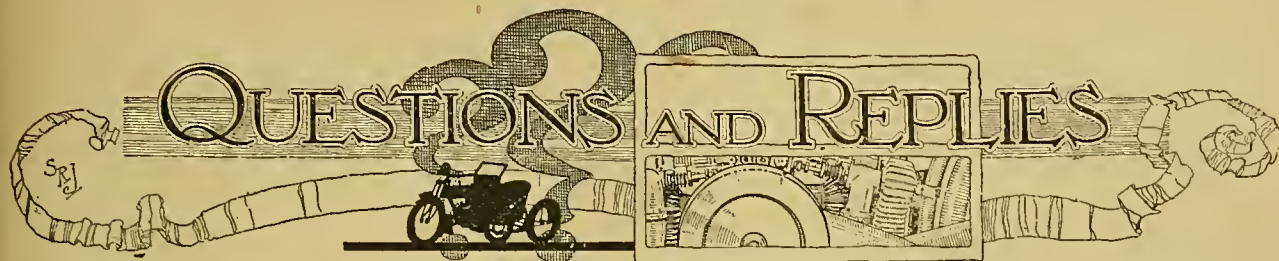
Fig. 6

ENGRO.

A MEET OF WEST OF ENGLAND MOTOR CYCLISTS.

Yelverton Rocks, a rendezvous familiar to Plymouth motor cyclists. It is situated on the high wild ground of Dartmoor. Among the machines shown are B.S.A.'s and an Enfield outfit.





A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C.4, and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

Knocking.

When going up hill I set my levers about two-thirds open, which seems to be the best position, although when going up a fairly steep hill the engine knocks, and, if I open or close the air lever, or open the gas lever, it knocks more, but if I close the gas lever it stops knocking, but slows up and stops. Would you please tell me the cause of my trouble?—O.J.O.

In hill-climbing, as soon as the engine shows signs of slowing down, gradually close the air lever. Have you tried benzol? The trouble is probably due to the machine being geared too highly. We presume the engine is free from carbon deposit?

Water Injection.

(1.) What is the address of the manufacturers of the Philipson pulleys, and are they now making them? (2.) If I fit one to my 1912 F.E. Triumph, will it enable me to take a featherweight sidecar? (3.) What maximum and minimum gear ratios shall I get, and is there appreciable belt slip on the lowest gear? (4.) In starting up on free engine, does the gear automatically lower itself until the machine is under way? (5.) My machine knocks very badly when it gets the least warm. The valve timing and ignition are correct. Do you think the compression is too high? I know that benzole will cure the trouble; but other machines of the same make and date run satisfactorily on No. 3 petrol, and I do not see why mine fails. Can you suggest anything? (6.) If I run on benzole, would it be an advantage to have a hot air inlet? (7.) Have you had any experience in running on paraffin with steam injection in the induction pipe; if so, is there any pre-ignition on full load?—P.A.H.

(1.) Messrs. Philipson and Co., Astley Bridge, Bolton, Lancs., and they are still marketing their pulleys. (2.) Yes. (3.) Depends on the size of the rim. The pulley sizes are 5½ in. top, 1½ in. bottom, which will give you your ratios. The belt slips when it rests on the bottom of the groove. (4.) No; the tendency is for the gear to climb to top. (5.) Your machine probably requires decarbonising. (6.) You require a good deal extra air with benzole, but it is not necessary to heat it. (7.) There is no pre-ignition with water injection, but it cannot be regarded as satisfactory excepting on high powered machines.

Address Wanted.

I have a Vindec Special. Would you oblige by giving me the maker's address, as I am in need of spare parts.—A.N.
The Vindec was marketed by Messrs. Brown Bros., Ltd., 22-34, Great Eastern Street, London, E.C.

Clearances.

(1.) Will you tell me the correct clearance between an air-cooled cast iron cylinder and (a) a cast iron piston, (b) steel piston, and (c) aluminium piston? (2.) A water-cooled cast iron cylinder and (a) a cast iron piston, (b) steel piston, and (c) aluminium piston? (3.) Also please give me the correct or approximate valve setting for a racing motor cycle engine.—J.C.D.

(1.) It depends on the bore of the cylinder. The same amount of clearance on a cylinder of 70 mm. bore would not do for one of 85 mm. bore. The average clearance with a cast iron cylinder and a cast iron piston is 4-1.000th inch. The clearance for a steel piston would be more than for a cast iron piston, and for an aluminium piston slightly more than for a steel piston. The correct amount of clearance is a question of experiment, and varies in the case of the different manufacturers. There is no fixed dimension. (2.) The clearance for a water-cooled cylinder and cast iron piston is approximately the same as for an air-cooled one. The cooling of the cylinder prevents distortion of the cylinder, but it does not prevent distortion of the piston which is subjected to the same amount of heat in a water-cooled engine, as in an air-cooled one, and, of course, the increased clearance in the case

of steel and aluminium pistons would be the same. (3.) There is no standard valve setting for a racing motor cycle engine; the setting varies with different designs, and there is no fixed rule. Below we give you a setting of a well-known 3½ h.p. single-cylinder engine: Inlet valve commences to open at 8° to 13°, and commences to close at 137° to 143°, and is completely closed at 207° to 213°. Exhaust valve commences to open at 135° to 140°, and is fully open at 220° to 226°. The exhaust valve commences to close at 272° to 276°, and is closed at 0° to 5°.

Too Much Noise.

I have a 3½ Norton which is fitted with an exhaust pipe, 1½ in. diameter, direct from the cylinder without any expansion box. The noise is especially noticeable when accelerating, or when travelling at high speeds. Am I rendering myself liable to prosecution, and if so, how can this be remedied?—W.J.A.

The only remedy will be to fit an expansion box, otherwise you render yourself liable to prosecution.

Lubrication of a Twin.

As my 4.5 h.p. J.A.P. twin seemed to be losing power, I took it down for overhauling, and found that both the rings on No. 1 cylinder piston were broken at the ends. The cylinder seemed rather on the dry side. (1.) Would under oiling cause the damage and be the most likely cause? (2.) Would it affect the running much? (3.) I am using extra heavy Mobiloil with Oildag. Would you consider this too heavy? (4.) Can I do anything to equalise the oiling of the cylinders, as the front cylinder is getting the right amount, and an increase would mean frequent decarbonisation? In this case the rear cylinder was much cleaner than the front? (5.) I suppose the baffle plate under No. 1 is a fixture, otherwise this might be drilled? (6.) Would a slack valve guide on the inlet valve cause an air leak and difficult starting, and would Duco valve lubricators help to ease it?—G.B.A.

(1 and 2.) Under-oiling would cause the damage of which you complain, and would naturally affect the running as it would allow the charge to escape past the rings. (3.) Perhaps the oil is rather heavy in cold weather. (4 and 5.) You might try the effect of drilling the baffle plate. (6.) We think valve lubricators would be beneficial in this case.

SPECIAL NOTICE.

TO EVERY READER.

TO ensure regular supply of "The Motor Cycle," readers are requested to place definite orders with their newsagents or at a railway bookstall for copies to be reserved or delivered each week. To depend upon chance purchase is to risk disappointment.

Old Spring Forks.

? I have bought an old machine, fitted with the old pattern XI-All spring forks. There seems to be a great deal of side play, so that the tyre rubs against the fork. Would you be so good as to tell me: (1.) Is this avoidable? And if so, how? (2.) Would some variety of pad taking the wear on the rim instead of the tyre be feasible? (3.) Is the present state of affairs dangerous? (4.) Would the stresses set up by a sidecar affect it in any way? (5.) Apart from the question of comfort, is this fork superior to a rigid one?—G.P.H.

(1.) Possibly washers of the spring type would take up the play. (2.) No we should not recommend it. (3.) Yes, for the tyre. Constant friction will rub through the cover and cause the air tube to protrude and burst. (4.) Yes. (5.) Any spring fork when working as it should is superior to a rigid one.

A Double Accident.

? I should be glad if you would put me right on the following point: Whilst driving my 4 h.p. Brabury and sidecar in Wales along with a friend on an 8 h.p. sidecar I met with the following accident. The other machine was a few yards in front, when the countershaft chain on the 8 h.p. machine snapped, locking itself around the sprocket wheels and locking the back wheel, which brought it to a halt within about three yards, incidentally smashing the low gear in the gear box. The stop was too sudden for me to clear the machine, and my front wheel caught the luggage grid, throwing my machine over on its side, smashing the front fork, wheel, mudguard, lamp, top and bottom tubes of the frame near the head, and twisting the sidecar axle partly out of the chassis. The only damage caused to my friend's machine was the buckling of his sidecar wheel, but this we were able to straighten up so that it would run. The 8 h.p. machine is insured for third party fire and theft; my machine is not insured. Have I any clear ground for a claim against him? The damage, roughly, may be about £20 to £25, as it might mean a new frame. I may say I have been riding motor cycles of nearly every make since 1910, and am looked upon as a safe and skilful driver. A witness to the accident was another member of the party in a car, who was behind and saw the smash.—F.B.J.

We should advise you to consult, through your friend, the insurance company, as to whether they will meet the claim he makes on your behalf. Personally, we do not think you have got a legal claim against your friend, as if the case were tried in the county court the judge would most probably decide that the snapping of the countershaft chain on the 8 h.p. machine and the locking of the back wheel were failures over which your friend had no control, and therefore it was an accident. We should recommend the claim to be made by your friend, who is insured, in such a manner that the amount claimed will cover your expenses.

An Old-type Twin.

? I have a motor cycle built by a local maker fitted with a V twin engine, 5½ h.p.; the ignition is by coil and accumulator. What will be the cost of a magneto, saddle, inner tube, and brake?—A.F.

Your best course is to apply to the local maker for a quotation for the parts you require. If he cannot estimate, then write to a firm like E.L.C. Co., Samson Road North, Birmingham; or Thomson Bennett, Magnetos Limited, Great King Street, Birmingham, for the magneto. The saddle, inner tube, and brake should easily be obtained in a city like Belfast.

Hub Gears.

? My machine is a New Hudson 1914 6 h.p. twin combination, fitted with Armstrong hub gear. This latter is far from satisfactory, and I should like to know if I could substitute, say, an Enfield two-speed countershaft. If so, would it be very costly?—D.K.

Doubtless you can substitute a countershaft gear for the hub gear mentioned. As to cost, enquire of the makers of the machine, Messrs. the Enfield Cycle Company, Ltd., Redditch, Worcestershire, and allow for the cost of fitting. It might entail some structural alteration to the chain stays, i.e., the tubes from the bottom bracket to the rear fork. You could get your hub gear put in order if you were to communicate with Messrs. the Cromwell Engineering Company, 327, Putney Bridge Road, London, S.W.15.

READERS' REPLIES.

Four-stroking.

"L.P." will find a No. 28 jet most suitable for his engine. There are no choke tubes in this type of carburetter (Senspray), but a remedy for the four-stroking will be found if he runs the engine as follows: Start up with air closed and spark advanced two-thirds (approximately), petrol lever about half-open. After running about twenty yards retard spark and petrol lever, and begin to open air lever slowly until engine is two-stroking perfectly. Should engine fail to two-stroke, depress air release valve several times, and release quickly each time. The remedy lies in the correct air mixture.—F. WILSON.

Difficult Starting.

With reference to the complaint of "H.S.," page 401, in the issue of April 17th, I have experienced a similar heart-breaking difficulty with my 1913 5-6 h.p. Rudge Multi. Perhaps "H.S." will try the following proved solution: Turn the engine until the inlet valve is open, and inject down the valve stem a few (very few) drops of petrol. This method of injection has at least saved me much hard labour. Injections through the compression top do not have effect if there is the slightest sign of carbon deposit, as the deposit blocks the passage.—STAN. W. SMITH.

I notice in *The Motor Cycle* of April 10th a letter from "A.G." in reference to the difficulty he experiences in starting his 1913 Rex. As I am in possession of a similar machine, I may be able to help

him in his hour of need and probable despondency. I may say that my first experiences with this machine began in the winter, and it was my doubtful pleasure to have to start the old 'bus from cold on the glorified (?) mixture untruthfully designated as petrol. I have learnt by now quite a number of dodges for starting my machine, and these may be of use to "A.G." I have a Binks carburetter on the machine, and have so far been unable to find any dead spot; for one thing I do not know what a dead spot is. Is it any relation to the things they put in petrol to increase the m.p.g.? With this carburetter I can get a mileage with sidecar and two passengers of 140 m.p.g., and can usually touch anything on the road that will allow itself to be touched. If you do not believe this statement it matters not, as I do not believe it myself, but I thought I would like to give you a shock. However, to get down to brass tacks, this old 'bus of mine, although approaching its sixth year on earth, is a wonder. Undoubtedly at first one experiences difficulty in starting, but I am quite sure when once "A.G." gets over the difficulty of starting (for further particulars, write the subscriber), he will find he has a jolly good old reliable in a 6 h.p. 1913 Rex, that is if it is in anything like the condition of mine.—C. N. WESTOBY.

[We are case-hardened to shocks of this kind. A letter addressed to our correspondent c/o the Editor will be forwarded.—Ed.]

EXPERIENCE WANTED.

"C.H." (London).—Auto-wheel attached to Olympia tricycle and assist pedalling on short journeys in a flat district, to carry two persons.

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Bradford, Otley, Ripley, Ripton, Masham, Leyburn, Richmond, Aldborough.

CARDIFF TO BRISTOL.—S.G.P.

Cardiff, Newport, Chepstow, Lydney, Gloucester, Thornbury, Bristol. Approximately 95 miles.

NOTTINGHAM TO WEYMOUTH.—F.H.C.

Nottingham, Loughborough, Leicester, Lutterworth, Rugby, Frankton, Southam, Banbury, Deddington, Oxford, Abingdon, E. Ilsley, Newbury, Whitechurch, Andover, Salisbury, Blandford, Puddletown, Dorchester, Weymouth. Approximately 150 miles.

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C.A.V. Magnetos
BRITISH THROUGHOUT

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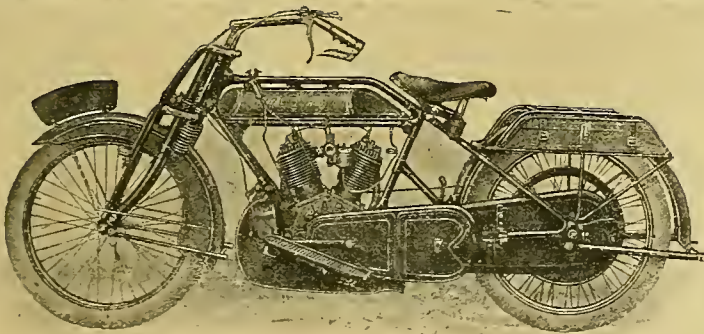
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ROYAL RUBY

6 or 8 h.p. TWIN.

Patented Points—No. 10.

The Sidecar Lugs.

Many sidecar attachments throw all the strain upon the bolts. In the Royal Ruby patent lugs, ribs and recesses are provided in the frame-lugs corresponding with recesses and ribs in the sidecar lugs; these take all the strain and provide a perfect, mechanical joint. The heaviest sidecar is safe on a Royal Ruby.

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Manufacturers of Royal Ruby Cycles, Motor Cycles & Sidecars
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ADVERTISEMENTS in these columns—First 12 words or less 2/6, and 2d. for every additional word. Each paragraph is charged separately. Name and address must be counted. Series discounts, conditions, and special terms to regular trade advertisers will be quoted on application.

Postal Orders and Cheques sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd.,** and crossed Treasury Notes, being untraceable if lost in transit, should not be sent as remittances.

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.4), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge, which must include the words Box 000, c/o "The Motor Cycle." Only the number will appear in the advertisement. All replies should be addressed No. 000, c/o "Motor Cycle," 20, Tudor Street, E.C.4. Replies to Box Number advertisements containing remittances should be sent by registered post.

DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pays carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged; when under £10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

MOTOR CYCLES FOR SALE.

Abingdon.

ABINGDON K.D., 3½ h.p., 2-speed, coachbuilt combination; 45 gns.; 1913.—Railway Garage, Staines. [9460]

4 h.p. Abingdon King Dick, Gradua gear, kick start just fitted, new handle-bars, tyres, lamp, and belt, being overhauled, ready ride away in fortnight; £40.—Box 3,397, c/o The Motor Cycle. [X9578]

ABINGDON, King Dick engine, 3½ h.p., F.E. pedal start, Bosch, new B.S.A. carburettor, new Dunlop belt, new Dunlop and Clincher tyres and tubes, Brooks saddle, £14/2/9 just spent on overhaul (receipt can be shown), mechanical condition as new, fitted with new lamp set, Klaxon, speedometer, mirror, to the value of £10; accept 40 gns., genuine bargain.—Apply, Hayns, 20, Chiltern Rd., Bow, E.C. [9160]

A.B.C.

A.B.C.—Earliest deliveries of the Birmingham and Coventry Cycle Co., Southampton. [8988]

A.B.C.—Sole agent for South Wilts; now booking orders for early deliveries.—Longman, Fisherton, Salisbury. [7742]

MAUDE'S Motor Mart

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A.B.C., P. & M., B.S.A., A.J.S.,
NORTON, ROVER, TRIUMPH
BLACKBURN, NEW RYDER,
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Best Prices Paid

SPOT CASH

for modern Motor
Cycles and Light Cars.

We invite your enquiries as to
specification and delivery dates.

Deliveries are made in
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100, Gt. Portland St.,
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MOTOR CYCLES FOR SALE.

A.B.C.

CROW Bros., High St., Guildford, have contracted largely for the new A.B.C. Order now for earliest delivery. [5298]

A.B.C.—Earliest deliveries; your name on our book ensures this.—Martin Mitchell, Ltd., Wholesale Distributors, Stafford. [X9866]

A.B.C.—We are now taking orders for the new A.B.C. twin; order now for early delivery.—P. Ellis and Co., 360, Lillie Rd., Fulham, S.W.6. [8460]

LIVERPOOL and District Agents for A.B.C. Place orders now to secure early delivery.—Victor Horniman, Ltd., 9, Parr St., Liverpool. [0003]

A.B.C.—Sole agents for these famous machines. Orders booked now for early delivery.—Chandler, Reyre, and Williams, Sun St., Hitchin. [0996]

JONES' Garage.—We are in a position to accept orders for A.B.C. motor cycles; deposits optional delivery April or May.—Broadway, Muswell Hill, N. [0991]

ISLE of Wight.—Witham Bros., Newport, I.W. are Island agents for A.B.C. machines. Full particulars on request. Orders being booked for earliest delivery. [7515]

A.B.C.—Distributors for Scotland. Book your order now to ensure reasonable date for delivery.—Edinburgh Pioneer Motors, Ltd., 50, Grindlay St., Edinburgh. [X8301]

FANCOURT'S Garage, Stamford, for A.B.C.'s; sole distributing agent for Soke of Peterborough and County of Rutland; particulars and illustrations on request. [X9724]

NORTH AVSHIRE.—Place your orders now. Early delivery of A.B.C. Demonstration runs arranged by appointment. You are interested, so write.—Unwin, Glengarnock. [8976]

WE ARE NOW BOOKING ORDERS for earliest deliveries of A.B.C. motor cycle. Secure an early delivery by placing your order with us now.—Dunwells' Garage, Wigan, Tel.: 328. [X3219]

A.B.C.—Book early and prevent disappointment. Specification and full particulars will be sent on application.—The Spalding Motor Co., Ltd., Spalding, distributing agents for Lincolnshire. [X6909]

DAN BRADBURY, 224, London Rd., Sheffield, sole A.B.C. distributing agent for Sheffield and district, will give you earliest possible delivery of the new A.B.C. motor cycles and light cars. [7270]

A.B.C.—Sole wholesale and retail agents for Oxfordshire and part of Buckinghamshire. Early deliveries guaranteed. Enquiries re sub-agencies welcome.—The Layton Garages, London Rd., Bicester, or 90, High St., Oxford. A.B.C. enthusiasts. Phone: 35 Bicester. [9334]

A.J.S.

JACK HEALY, Cork.—Official A.J.S. agent.—Garage and works, Urrinan St. [X8336]

2½ h.p. A.J.S., 2-speed, clutch, tyres nearly new; £4 22s.—Lucas, Send, Woking. [9203]

CROW Bros., Guildford.—A.J.S. Agents since 1912. Write us for your requirements. [9777]

19 A.J.S. Combinations.—Write Merrick's Stores, 174, Listerhills Rd., Bradford. Phone: 2439. [X2436]

A.J.S. Spares, prompt delivery.—Cyril Williams, Chapel Ash Depot, Wolverhampton. Tel.: 9169. [9169]

A.J.S. 2½ h.p., late 1914, 3-speed, clutch, kick start, Bosch; £39.—Lewis, 6, Mattock Lane, Ealing, Broadway. [X9596]

2½ h.p. A.J.S., good condition, Senepray, Bosch, ready ride away; £22.—163, Tudor Rd., Hampton, Middlesex. [9055]

2½ h.p. 1916 A.J.S., 3-speed, all-chain, kick start, clutch, really sound condition; £65, or nearest.—Box 3,402, c/o The Motor Cycle. [X9580]

A.J.S. 6 h.p. Combination, 3 speeds, kick starter, good condition; accept £75; seen any time.—19, Fairfield South, Kingston-on-Thames. [9290]

A.J.S.—For quick deliveries try the sole Leicester-shire agent, Will Chapman, 113, Belgrave Rd., Leicester, the first appointed A.J.S. agent. [3531]

19 A.J.S. 6 h.p. Combination, fully equipped, just been thoroughly overhauled, good condition; £128; after 5—18, Hestercombe Av., Fulham. [9391]

19 A.J.S. Combination, Watsonian coachbuilt side car, perfect condition absolutely; £97/10.—Bromley Oswell, Handley, near Wellington, Salop. [X9791]

A.J.S.—Exeter Motor Cycle and Light Car Co., Ltd., Bath Rd., Exeter, and 28, Tavistock Rd., Plymouth. Sole agents. Now booking for earliest deliveries. [0007]

A.J.S. Combination, 1916, complete, as new; £135, first cash scrap.—Vivian Hardie, Ltd., 24, Woodstock St., off Oxford St., Bond St., London, W.1. Phone: Mayfair 6559. [8979]

THE MOTORCYCLE

ESTABLISHED IN 1903

AND FOR OVER SIX YEARS THE ONLY PAPER SOLELY DEVOTED TO THE PASTIME

Advertising and Publishing Offices:

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SOUTH AFRICA—Central News Agency, Ltd. PARIS—Smith's English Library, 248 Rue Rivoli.

Clutches and Variable Gears.

IN some cases a certain amount of confusion exists in the minds of many as to the difference between a clutch and a variable gear. This confusion of thought is not so much apparent when clutches and gears of the ordinary types are under consideration, for it is realised that a clutch is a friction device, the object of which is to take up the drive as smoothly as possible, whereas a gear is a more positive arrangement designed to give various definite relations between the engine and the road wheel. It is quite true that the road speed can be reduced while the engine speed remains constant by both clutch and gear, sometimes the one being more convenient, and sometimes the other. Briefly, the difference between the two is that in the case of the clutch the speed is reduced by a waste of power, and therefore the turning moment of the road wheel is not increased, but when the higher ratios, *i.e.*, the lower gears of a true variable speed gear, are brought into action the torque of the road wheel is very largely increased. Hence comes the greatly increased hill-climbing power possessed by a motor cycle on its lower gears.

This difference is also apparent when the machine is running at small throttle openings on the level, a change down of gear being sometimes followed by an increase of speed, because the engine speed rises under the lighter load. The engine speed will rise equally when the clutch is partly withdrawn, and for the same reason, but no increase of road speed takes place—rather the reverse; this clearly shows that the power is lost. On a hill the clutch is sometimes of value in enabling a machine to top a rise where the engine might otherwise konk out, but this is simply because the use of the clutch allows the engine to maintain or even increase its "revs.," and thus give out greater power than it does when losing speed.

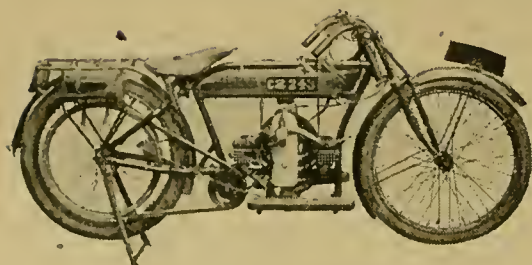
If these facts were always kept in mind, we should not hear hydraulic and electric clutches

described as variable gears, for a hydraulic clutch is brought into action by allowing a certain proportion of the oil, or other liquid, which it contains to escape from one part to another, and this escaping oil does no useful work, but simply takes some of the load off the engine. Hence this is more correctly described as a clutch.

Caveat Emptor.

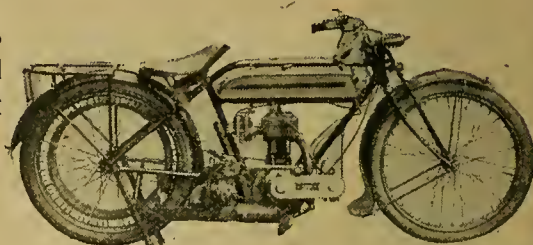
OWING to the rush for motor cycles ready for immediate use, many dealers are tempted to put up their prices to a somewhat high level. While this level does not exceed what is right and proper considering the high prices of practically every commodity and the high cost of labour, or, on the other hand, the decreased purchasing power of the sovereign, no one has any right to complain. Naturally the scarcity of new machines reacts upon the second-hand market and causes a general inflation of prices with the consequence that a good second-hand machine fetches, and is really worth, more than it cost when new. The prices obtained in the Government sales are proof of this. It is when high figures are charged for motor cycles in indifferent order that the buyer has a right to complain. Instances have been given in our columns of machines being purchased and taken away after only the most cursory examination. If a rider makes a purchase in this manner, he will certainly have himself to blame if the machine turns out to be unsatisfactory. When purchasing a machine from a private seller, a trial run should be obtained, and, if possible, a test made upon a hill. Naturally, in the case of a solo machine, the seller will not care to entrust his mount to a total stranger unless the value be deposited with him, but, if the buyer is in earnest, there should be no difficulty about this. If, on the other hand, a sidecar is for sale, the prospective purchaser can easily be given a trial run, with the owner on the saddle.

A Sale of Canadian Army Motor Cycles.



A 2 1/2 h.p. Douglas sold for 50 guineas

More Surplus
War Material
disposed of at
High Prices.

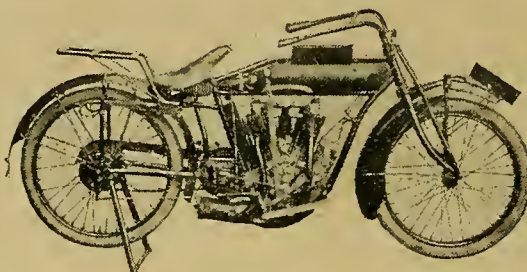


A 4 h.p. Triumph, which realised 69 guineas.

A BATCH of thirteen 1916 model 7 h.p. twin-cylinder Indian motor cycles was offered for sale at a sale of Canadian Army motor cycles which took place on the 5th inst. at the British Motor Cab Company's depot, 1, Brixton Road, London, S.W.9. The auctioneers were Messrs. Geering and Colyer, of Ashford, Kent.

The auction began at 11 a.m., and was well attended, about 300 people being present, which, once more, illustrates the interest of the public and the demand for motor cycles at the present time.

The Indians in question had recently been repainted a dark green, and presented a distinctly smart appearance, and were in fairly good condition, though the engines in some cases required the fitting of a few small parts. The auctioneer, in answer to a question, forcibly replied that he would give no guarantee for any of these machines—a remark which caused much amusement. The very last thing one might expect would be a guarantee for a disused Army machine.



One of the thirteen 1916 model 7 h.p. Indians sold at an average price of 58 guineas.

The average price paid for these motor cycles was 58 gns., and the highest price 100 gns. Four Triumph motor cycles were next offered for sale, the average sum of 62 gns. being realised. These machines were of the 1915 4 h.p. Army pattern. The condition of the engines in some cases was rather bad, and one mount, which fetched 60 gns., had the carburetter missing, as well as the

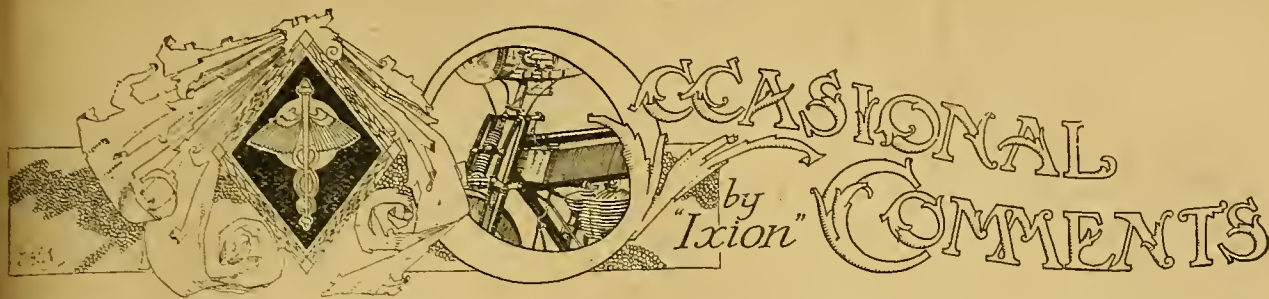
controls, front fork spring, and the sparking plug. The highest bidder paid 69 gns. for one of these machines.

Two Douglases, one 4 h.p. 1915 model, and one 2 1/2 h.p. model, were next put up for auction. The 4 h.p. mount, which had lost its clutch, chain wheels, exhaust pipe, silencer, plugs, and saddle, was bought for 56 gns. The other, in better condition, realised 50 gns.

The bidding was slow at first, but with the help of a clever and witty auctioneer, improved later to a firm competition, and on the whole the machines realised more than their full value.



A travelling workshop catering for motor cyclists in the Plymouth district. These motor vans have been in service for the aid of car owners for a long time, but up to the present very few garage owners have been sufficiently enterprising to cater specially for stranded motor cyclists.



Traffic Education.

WHILST the petrol famine temporarily reduced me to pedestrianism, or at least to unwontedly large doses of that over-rated sport, I noticed with grief how absolutely devoid of the road sense the average pavement user is. Once he or she quits the sidewalk, acute danger compels the pedestrian to aim at being alert and nimble; but on the sidewalk he has about as much road sense as a lost calf. He walks slowly along the dead centre or the wrong side, with his stick projecting, so that one eight stone man can block an 8ft. walk; she collects her friends, and wheels perambulators three abreast; they join arms, take corners on the wrong side, or pace to and fro in the Strand during the luncheon hour. I thought often and deeply that there was a loud call for instructional posters on the proper use of the pavement, such as the anonymous "Safety First" people have published anent hopping on and off 'buses or crossing the road. But I positively blushed at the way in which I saw motor cyclists drive during the holidays, and some of them men in khaki at that. They swirled out of by-roads at speeds that took them well over on to the wrong side of main roads, right out into streams of thick traffic. They cut blind corners. They created emergency after emergency by trying to overtake other motors round blind corners, or when oncoming traffic blocked the other half of the road. They turned down side roads abruptly without signalling or looking astern, often commencing a wheel from the centre of the "pretty," as golfers call it. All that could be said for them was that on the average they were very quick with their brakes in tight corners, and that everybody, whether sinned against or sinning, had a good-tempered grin, instead of an oath when the *bêtise* failed to result in slaughter or a crash. Why do not the A.A., R.A.C., and A.C.U. cease to spend our money on offering to get us licences which we are perfectly capable of obtaining for ourselves, and adorn tubes, 'buses, waiting rooms, bars, and other places of resort with merry pictures demonstrating the folly of overtaking a broad car round a blind corner in a narrow road, or otherwise courting a pink and messy death? Cyclists are equally guileless and unimaginative.

A Narrow Escape.

I HAD nearly broken my oath. My last paragraph had brought me to the brink of describing how a fat woman with a basket of eggs—when I recalled how a certain cycling club once saved me from committing manslaughter. Confession is good for the soul, so I may as well confess that I was in a great hurry, and I took a fairly easy bend in a broadish and remote highway much too fast. Imagine my horror on rounding the corner to find the road packed from hedge to

hedge with the serried ranks of a cycling club pedalling merrily in the same direction as myself. I could not stop in time, but they saved me. Somehow or other the outside men in each rank fell off their machines into the hedges, and the inner men did a one pace right or left close, as the case might be, leaving an alley right through their centre, down which I hurtled, grateful, but ashamed.

Gee-whizz.

I DO not use the above expletive for ordinary consumption, but it seems appropriate if inadequate on top of news I have just received. One of the gentry who once made a fat living by importing big twins tells me he thinks that the partial prohibition of imports will make way for a 33⅓% tariff in the late summer, and that he expects to sell as many big "seven-nines" as America can let him have, the British retail price being within smelling distance of £140! This item provokes quite a galaxy of stimulating thoughts. First of all, I did not know costs had risen in U.S.A. to such a height that a big twin plus Atlantic freights, insurance, and London profits came out at £105 (exclusive of tariff). Secondly, when supply overtakes demand, a selling price of £140 ought to spell a close season for those British twins which intend to oust the big Yanks from popular favour; of course, as long as our pockets are full and there are five buyers for every new machine available, £140 is a bagatelle; but if British makers cannot sell against a price like £140 in 1920, they will deserve all they get—I mean, lose. Thirdly, I wish I knew exactly why a large percentage of the big twin buyers in this country prefer Yankee stuff.

De Gustibus?

THE big American twins are charming mounts when they are new, but they do not (or did not) wear like Britishers. They are usually very well sprung forrards, and some of them are sprung aft as well. They have mechanical lubrication of a kind. They have walloping big tyres. They possess engines of the semi-woolly order, and pull superbly on top gear. But I am never quite sure why some of our riders have such a passion for the imported stuff, and I am not certain whether the American manufacturers themselves understand it. I am sorely tempted to place two factors high in the psychology of preference. One is that the machine as a whole is "different" from the British single on which the buyer probably served his apprenticeship, just as a Douglas gives you novel sensations after ten years on Triumphs. The other is that, though the design is not really "cleaner" than our own, it looks so; the machine seems more compact, and looks as if it had been planned as a whole, whereas some of our pre-war twins were spiky,

Occasional Comments.—

and bristly, and gave the impression that they were constructed of a number of ill-matched components fitted together. Finally, Yankee "service" is proverbially better than our own used to be.

The Time to Strike.

ANYHOW, a period of restriction followed by a continuation of high tariffs gives any British maker who knows how to design a twin a chance to strike. The Yankee twins are good, but they are not competition-proof; and the number of their '14 sales constitutes a market worth attack. Most of them give a rider more petty trouble than a first-class British machine, and the inevitable stage at which substantial repairs become unavoidable arrives earlier. They are quite absurdly heavy; 3 cwt. is surely excessive for a solo 'bus, and is not even to my mind pardonable on a sidecar hauler. The American front fork is good, but not better than two or three of the best European patterns: Americans have no essential monopoly of rear springing. Their much-boomed lubrication systems are not to be compared with the principles embodied in the new A.B.C. I am not by nature and preference a bestraddler of their cumbersome projectiles: I eschew sidecars, and find that a class 500 c.c. will do all that a solo man requires; so I must not be dogmatic on the secret of the spell that post office red or dove-grey with vermilion streaks has for so many eager buyers. I view the tug of war without animus. If the Yankee twins are really better, let them capture our 7-9 h.p. market, and let the British rival take its medicine like a man. I merely point out that the Britisher has a splendid opportunity to make sure of this threatened market, that the 1914 sales contain pointers to guide him in diagonalising public taste, and that now is the time.

The Sedan Scooter.

66 **E**VERYDAY Science "does not damn the scooter with faint praise. It anticipates the day when scooters will be fitted with coupé bodies. A pair of flat twins are to be mounted on each side of the steering head, and parallel to it,

driving the front wheel by chains ingeniously enclosed inside the front forks. A pair of aeroplane wheels are carried astern on tuck-up forks, and serve to steady the machine when stationary. How I should relish the ascent of Shap on this model against a stiff head wind! But perhaps the root idea is to utilise excessive wind resistance as an automatic speed limit. I commend this ingenious principle to future labour governments, who might compel all the *bourgeoisie* to affix steel discs eight feet in diameter to their front forks, such discs to be at right angles to the track.

Dishonest?

I HAVE just saved an impecunious novice from pouring his limited capital down the sink. He lives in a fearsomely hilly district, and the local roads during half the year are simply strips of morass. Knowing nothing of the sport or trade, possessing rather limited cash, and desiring immediate delivery, he got into the hands of a firm of dealers who had a baby two-stroke to sell, and had all but succeeded in dumping it on him plus a sidecar! I am ready to believe that, in certain comparatively level districts, an expert may obtain results of a kind with a first-class baby two-stroke and a sidecar. But to sell such a kit to a novice resident amongst mountains! To be frank, there were just a few makers' catalogues in 1914 which erred—shall we say, on the side of optimism? Lies never make a foundation for sound business: and unfortunately some of our greenhorns swallow all catalogue statements with a childlike faith. Our best firms write their catalogues with commonsense and self-restraint.

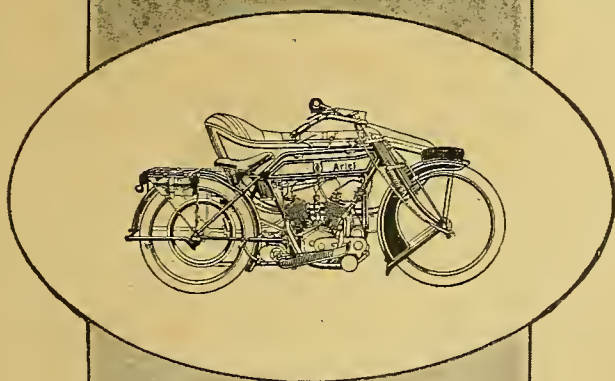


During the war we have had ample evidence of the motor cycle's great reliability in the hottest parts of the world. It is no great surprise to hear that it has proved equal to the task of negotiating the pathless ways within the Arctic Circle. The photographs sent by Lt. A. J. Roberts show a 4 h.p. Triumph outfit that successfully withstood most severe tests whilst with the Northern Russia Expeditionary Force.

ARIEL

MOTOR CYCLES

· 1919 ·



THE ARIEL 1919 CATALOGUE

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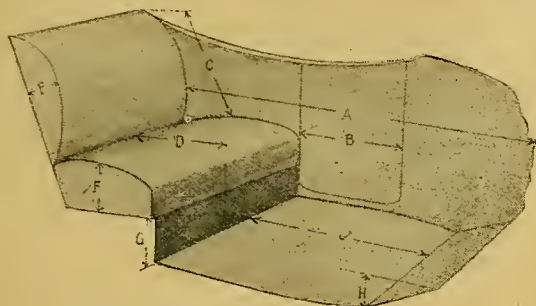
ART AND THE SIDECAR.



With a
Few Suggestions
for Improving its
Utility and Comfort.

FIVE years, and with a war taking up almost the whole of it, is quite a short time when viewing the progress of art or industry, particularly so in any case where the two are allied, and it is a very short time ago since art and the sidecar seemed far removed from one another.

The primary object of the sidecar is undoubtedly to accommodate a passenger; alas, that now we are getting family sidecars to seat two and three people, though comfort is studied, the possibility of accomplish-



The many points contributing to a passenger's comfort:

- | | |
|---------------------------|-------------------------|
| A. Overall body room | F. Thickness of cushion |
| B. Door opening | G. Height of seat |
| C. Height and slope squat | H. Slope of footboard |
| D. Depth of cushion | J. Leg room |
| E. Thickness of back | |

ing this with any pretence to elegant appearance is very remote. It is also true that some designers strive mainly or totally for effect in looks to the entire exclusion of comfort.

The coachbuilt sidecar is, in nine cases out of ten, a sorry recommendation of the coachmaker's handicraft. There are exceptions, of course, the Canoelet being one of the best examples, but many are ill-shaped affairs covered with mouldings, transfers, ugly fittings, and that most detestable fad of the cheap coachpainters' art—a surfeit of fine lining.

To provide one comfortable seat is about as much as can be conveniently and satisfactorily managed on a sidecar chassis, anything more needing a larger chassis, which becomes unwieldy, unsightly, and certainly unfair to the cycle frame, to say nothing of the poor engine.

There is no reason that I can see why so many motor cycles and sidecars should be capable of improvement, and this opinion is supported by the few very smart turnouts one sees on the road, and I think perhaps the blame for this, as in all things, lies as much at the door of the buyer as the manufacturer. He accepts the sidecar as he accepts so much else which does not happen to be the thing he is buying—all accessories are evidence of this. He is scarcely in-

terested in the type of lamp and horn to be fitted—anything will do.

Then again, from the manufacturer's point of view, the attractive and comfortable sidecar—and by comfortable I mean not only comfortable cushions and back squabs, but protection from the elements—is going to be a telling factor in future sales, and, further, if this can be accomplished, it should aid the sidecar in competing with the light car.

Mention of protection from the elements reminds me that, when in conversation with a member of the trade the other day, the subject turned on sidecars and their equipment. He expressed the opinion that the passenger is no better off behind a screen than without one, and that a hood is all that is necessary. Very few sidecar passengers who have used sidecars with correctly shaped screens will agree with this. The correct type is one that is capable of being brought close up to the occupant and having side wings or alternatively a V or semi-circular type of shield. An elaboration of this idea is preferable to a hood and screen.

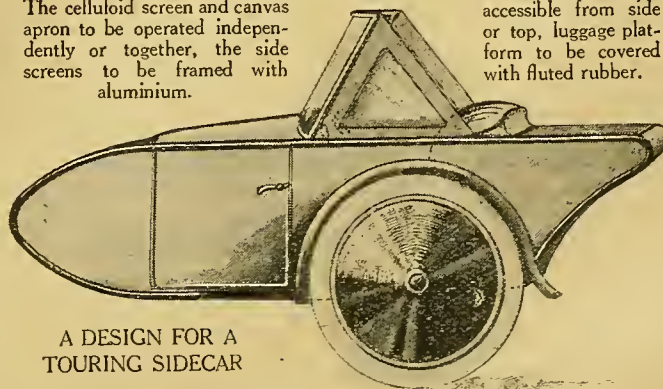
A Combination Hood and Screen.

A hood alone fitted to a sidecar, or any vehicle for that matter, appears to be the height of folly, as it serves as a veritable scoop for wind, and, of course, rain when that happens to come along. A hood made with a large celluloid light, and hinged as in a perambulator so that it might be used in either direction, would be a rather serviceable fitment in the absence of a more orthodox hood and screen. One illustration shows this suggested fitting. The Easting screen seems to be quite a good fitment, though the writer has no actual experience of it.

It should be understood that these remarks are applicable to the larger sidecars such as are fitted to

The celluloid screen and canvas apron to be operated independently or together, the side screens to be framed with aluminium.

Locker space, accessible from side or top, luggage platform to be covered with fluted rubber.



A DESIGN FOR A
TOURING SIDECAR

Art and the Sidecar.—

machines suited to heavy and continual two-passenger work; that is to say, nothing under 4 h.p. At present I have in my possession a well-known $3\frac{1}{2}$ h.p. V twin, and am so satisfied with its delightfully smooth running, coupled with plenty of power, that I am sorely tempted, in spite of the maker's advice to the contrary, to fit a sidecar. One reason why I have so far refrained is that the occupant of such an apology for a comfortable vehicle, as in justice to the motor cycle frame I should fit, would find little more protection and comfort than on the carrier seat, where the driver forms an admirable weather shield. I do not intend to enter here into the horse-power question; nor yet is it my intention in this article to uphold the cheapest (and I will not say least enjoyable) method of travelling for two.

The tendency of some builders to follow the lead of the "smart set" by designing sporty sidecars is, to my mind, to be deprecated, since many of the resulting atrocities are little more than slippers where one sits "on" rather than "in" the vehicle, which spoils the only saving point of the outfit's qualities—its smart appearance—by making it appear ridiculous in the eyes of the more staid motor cyclist.

Points Designers Should Consider.

The diagram given on page 485 illustrates a few of the points where protection is required and where the comfort of the passenger might be improved by a little studious attention from the designer.

The design I submit for consideration embodies many of the features suggested. Good locker accommodation is provided elsewhere than under the seat. Provision is made for carrying luggage by means other than unsightly and rattle-producing folding grills.

Amongst other means to the attainment of pleasurable pleasure sidecars—and by this is meant of pleasant appearance: a comfortable means of long or short distance travelling, and in every way the opposite

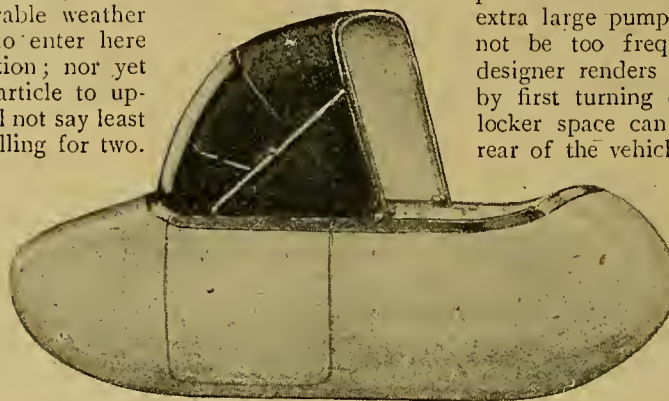
of a nuisance and a makeshift—I would suggest a more critical examination at competitions and club runs. A few of the points for which marks should be given are: (1) General appearance of complete vehicle, accessories, and luggage; *not* merely the design and condition of the body, though the condition, too, should receive attention as being an index of correct design and construction. (2) Comfort, *i.e.*, roominess, protection, ease of ingress and egress. (3) Utility, *i.e.*, luggage carrying capacity, etc.

The provision of a locker under the seat as the *only* place in which oil, carbide, tools, spares, extra large pumps, etc., can be stowed cannot be too frequently deplored, until the designer renders it accessible otherwise than by first turning out the passenger. Ample locker space can easily be provided at the rear of the vehicle, and that without rendering the body vastly heavier or more unsightly. Indeed, in my opinion, the appearance may be improved rather than otherwise in this manner.

Just a final word on colour schemes. I think we have had quite enough of camouflage, and I fancy, moreover, that dazzle has gone quite

far enough; at any rate, I am sure there are realms other than motor cycling to which their uses are more fitted. So, then, when we have a cycle whose colour is green with gold lines, may we hope in the future to find harnessed to it a sidecar similarly bedecked, and not sporting a post office red nor yet a chestnut hue, as I saw the other day? They all may be very beautiful, but to flash around the whole contents of the paint box on one outfit is to savour rather too flagrantly of the colour merchant's sample cards. In this respect I remember the earlier $3\frac{1}{2}$ h.p. Douglas, itself a pretty machine in its silver and blue, but the fitting of a sidecar, also in itself one of the prettiest, to wit, sage green with red upholstery, did not improve the *tout ensemble*. The parallel in car work would be the painting of the bonnet, say, a blue with green coachwork!

H. T. BALLEMY.



A suggestion for a hood-screen, to be used either as a screen or as a hood.

CHEAP FUEL IN THE FUTURE.

IN the current issue of *The Autocar* the question of cheap fuel is dealt with in an article on Natalite motor spirit. As the price of fuel will constitute one of the most potent factors in the future welfare of motoring, the statement that this fuel can be manufactured and sold at a price that would defy competition from the petrol companies is distinctly cheering.

Natalite, as we have already stated, owes its existence to the ingenuity of inventors in Natal, South Africa, and consists of 54.3% alcohol, 45% ether, 5% ammonia, and 2% white arsenic, the last named being suggested as a denaturant. *The Autocar* says that those who have carried out road tests with Natalite extending for as long as six months seem perfectly satisfied that the fuel has no harmful effect on the

engine, and they claim that with it they get practically as much power as from petrol. No motorist in the United Kingdom has yet had an opportunity of substantiating these claims, but that they are capable of confirmation seems probable from the opinions held and published by a large number of expert chemists in various parts of the world.

The one thing which now stands in the way of the use of Natalite fuel in this country is the Excise regulation. We do not think that the Excise authorities are immovable, and we have reason to believe that, if they can be convinced that a suitable denaturant which will render the alcohol undrinkable will be employed, they will not raise insuperable obstacles to the manufacture or importation of Natalite.

Birmingham M.C.C. Easter Competition
"Victory" Cup Trial.

B.S.A.

FOUR GOLD MEDALS

L. BAKER, L. L. SEALEY, C. PERCIVAL, and H. R. LANE, and

FOUR SILVER MEDALS

R. H. NICHOLLS, A. A. FARR, W. R. STEEL, and E. HILL

OUT OF EIGHT ENTRIES.

GREAT SUCCESS OF B.S.A.

in Copenhagen Motor Cycle Club's Race.

Our Agents wire :

Received from Copenhagen, April 22nd.

"In Copenhagen Motor Cycle Club race April 12th and 13th, 400 miles, 2 B.S.A. motor cycles came in as Nos. 1 and 2.

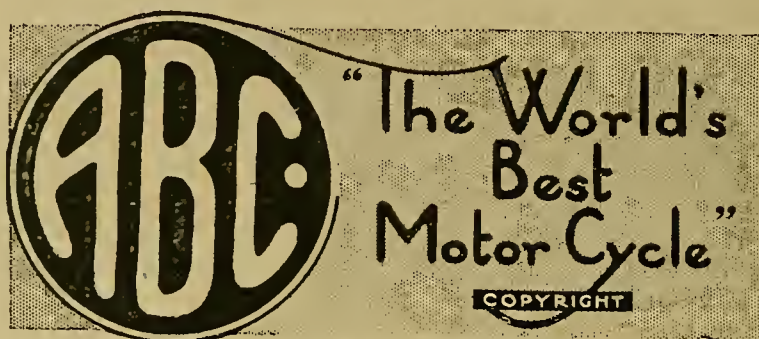
They were the only motor cycles or cars that completed the race within stipulated time."

B.S.A. Motor Bicycles for Reliability and Speed.

New Catalogue Post Free.

THE BIRMINGHAM SMALL ARMS CO., LT BIRMINGHAM.

THE NEW 3 H.P.



REPRESENTS

REAL PROGRESS

There is a "date" on every part of the whole design—and that "date" is "1920," not "1914-and-a-bit."

Price
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The **Engine** is **better** than any previous motor cycle engine. It embodies the very latest aircraft practice.

The **Gear Box** is **better** than any previous motor cycle gear box. Four speeds, gate-change, no noise, high efficiency.

The **Transmission** is **better** than any previous motor cycle transmission. Enclosed bevel and final slow-speed chain. Weather-proof, simple, and of lasting efficiency.

The **Suspension** is **better** than any previous motor cycle suspension. Perfect comfort, great lateral rigidity, no wear and tear, scientific design.

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EXPERIENCES WITH A 3 h.p. TWIN.

An Appreciation and Some Criticism of an Interesting Mount, based upon a Year's All-weather Riding.

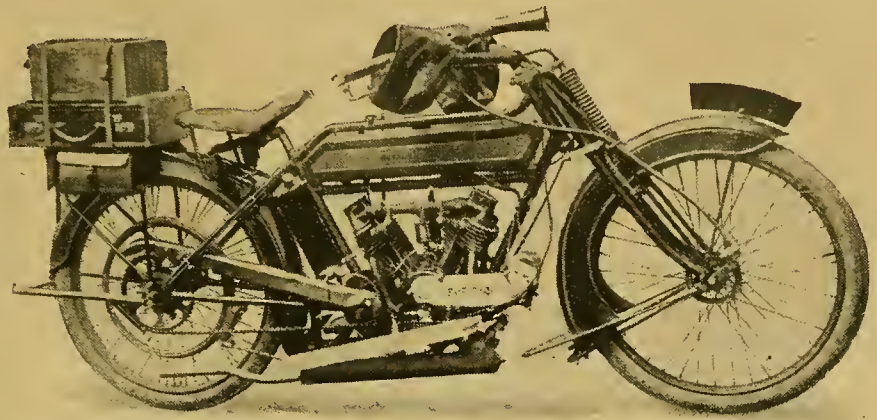
TO combine a general average speed of 30 m.p.h. with petrol consumption of 105 m.p.g. is not the rule with light-weights, yet this can be stated without exaggeration to be the regular behaviour of the 3 h.p. V twin Enfield, which the rider has used constantly for a mileage of four thousand. The machine was used for week-end journeys of about one hundred miles each way, with occasional business runs.

It was purchased early in 1917, and its first run was on snow-covered roads with a return during the subsequent thaw over half-flooded roads—a rough test through which it behaved excellently. At first it promised to be a mud-slinger, which was partly due to the speed—30 m.p.h. riding for long through watery slush is bound to produce a very dirty machine and rider, but the machine always held the road in grease exceptionally well; not the slightest tendency to side-slip was experienced during the whole of its use.

These journeys were kept up at intervals of two or three weeks for some nine months. Several times the run of ninety odd miles was made without a stop in approximately three hours, and never did the journey occupy longer than four hours. The only involuntary stops were through comparatively trifling things, a broken throttle wire being the most troublesome; lack of power was noticeable only once or twice, and on one occasion the nuts securing the magneto drive casing and magneto platform worked loose through vibration.

Speeds.

The highest speed recorded (and the speedometer has proved to be very accurate) was 46 m.p.h. No doubt if specially tuned for speed, it would exceed 50 m.p.h. It was not this good figure which was the chief attribute in speed; it was the steady way in which it would keep humming at 30 to 35 m.p.h. There was an unobtrusiveness at this speed which often caused the rider to suspect that the speedometer was recording inaccurately, but a good total time for the jour-



The writer's 3 h.p. Enfield. Note the carrier box, which protects a small leather travelling case, also the handle-bar muffs; they proved very cosy.

ney always dispelled this doubt. A repeated average of 30 m.p.h. on a hundred mile journey, which includes eight to ten miles of town traffic, is an excellent performance for a 3 h.p. machine.

Petrol Consumption.

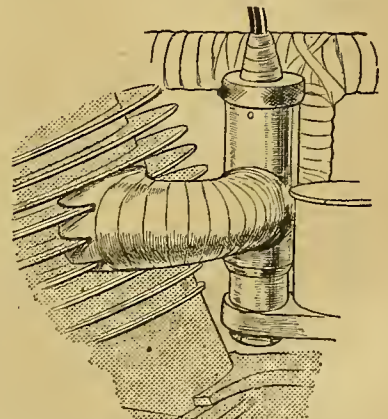
105 m.p.g. is not a careless computation, but the amount of petrol purchased divided into the mileage without any allowance for waste. This was obtained without any special fittings except the substitution, for the original air inlet, of a curved intake serrated to fit between the fins of the back cylinder. All possible points of air leakage in the induction pipe and carburettor were carefully wrapped with insulating tape.

No freak hill-climbing was attempted, but the engine hardly ever required second speed on ordinary main road hills; therefore I should say that the machine possessed excellent hill-climbing abilities.

It was very light on tyres, but the back tyre was renewed after 2,500 miles by reason of a bad gash which rendered it nearly useless.

The consumption of lubricating oil was not checked very carefully, but it was somewhere in the neighbourhood of 1,800 m.p.g.

I have nothing but praise for the well-known Enfield gear and shock absorber; the latter was particularly efficient, and, to my



The hot air intake. Observe the tape-wrapped carburettor joints.

Experiences with a 3 h.p. Twin.—

surprise, when recently dismantled for examination, the rubber blocks showed no sign of wear or loss of resilience.

The engine was not touched until some 3,000 miles had been covered; there was practically no sign of wear and no unusual amount of carbon deposit.

Now for some points of criticism, which are intended in a spirit of friendly opinion and in no sense expressing dissatisfaction.

Starting.

On very cold mornings, it was extremely difficult to start; exactly why this was so, I was unable to ascertain. Certainly poor quality petrol was part of the trouble, but not all; a pair of Parker vaporisers fitted in the induction pipe gave some little improvement. Once started there was no further difficulty.

Comfort.

I cannot entirely recommend the machine for a tall rider (but then, very few lightweights are suitable for people over six feet), but the medium or short rider should find it quite as comfortable as most machines without spring frames. The best position I could find produced discomfort on a long run, but the fault lies chiefly in my own 6ft. 2in.

One point of detail which needs alteration is the filler cap of the glass oil reservoir; being about $\frac{3}{4}$ in. diameter and only projecting about 1in., it is very nearly impossible to pour oil directly into it from the ordinary can. I suggest that the diameter be increased to at least two inches, and it should project more and be formed with a cup as shown in the adjoining illustration.

Undershield.

An efficient undershield and magneto cover are badly needed, and I would recommend a complete redesign of footboards incorporating with them, in one unit, an undershield, leg-shields, and magneto cover, having a short extension backwards under the driving chain;

the front wheel has an annoying way of spraying mud on the underside of the countershaft sprocket.

Kick Starter.

The forward position of the kick-starter and direction of push is distinctly awkward, and I gave up the use of the kick-starter and almost invariably started by paddling off in low gear. I think a new type of starter should be fitted behind the engine with an action which will enable the rider to employ his weight to better advantage.

Magneto Staging.

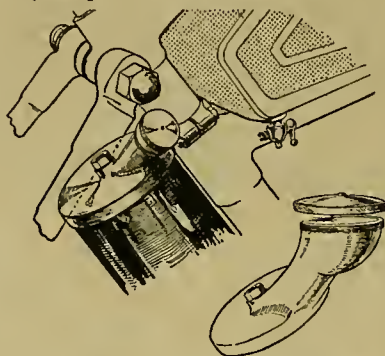
The method of carrying the magneto on an extension of the driving chain covers is not so good as it might be. Only three of the five small bolts carry the weight, and they in turn take their support from the timing case cover; the hinged supporting strut under the magneto platform is of very little use. When the outer cover plate is removed, the whole casing and the magneto on its platform sags over for want of lateral support. The cover plate should be removable without affecting the support of the magneto in any way, and the magneto platform should have lugs to clip it to the down tube; the inside half of the magneto driving chain cover should be cast in one with the timing case cover.

The question of control wires inside or outside the handle-bars has been oftentimes a bone of contention. I am not personally enamoured by the Enfield method of enclosing the Bowden wires or the fixed lugs to carry the levers, though both these are neat.

Despite the points indicated, I shall still take an Enfield before many other makes, when I require a fast, reliable, solo lightweight; and I retain memories of many enjoyable runs on this interesting machine.

F.A.S.

[The magneto fixing has given no trouble on a similar machine in our possession, and as regards the writer's trouble in starting, this is certainly curable. Only the combination of frost and No. 3 war spirit has caused sluggishness in our case.—ED.]



In place of the small oil filler cap provided, a suggested alternative is shown.

STAINLESS STEEL.

IT is only a question of time when the entire motor cycle industry will recognise the enormous use that can be made of stainless steel, and it may be expected that many makers in the future will use it for valves and exposed metal work.

Stainless steel is a chromium alloy steel, with the composition of 12.5% chromium and very low, .28%, carbon, the rest being iron and the usual impurities. Its outstanding peculiarity is that it is perfectly impervious to atmosphere corrosion.

As regards its mechanical properties, it can be given any desired tensile strength (and so hardness) from 40 to 100 tons per square inch by suitable heat-treatment. It also shows a remarkably high resistance to fracture by impact upon it; in the well-known Izod impact testing machine it required eighty foot-pounds to break a notched test piece.

From these data much can be gathered. Enamel work can be dispensed with, and, if desired, an entire frame be made with it, as it can be readily drawn into tubing. It can be pressed into rough or accurate shapes for control levers and nuts. Spokes and rims can be made of it with the greatest of ease. Of course, its greatest work can be done for valves, scaling is unknown with rustless steel valves.

Its great fault is that it cannot be easily cast owing to its high melting point (about 1,400° C.), thus it is out of the question for cylinders and crank cases.

Probably the present cost of this steel, which, owing to the high price of chromium, is large, will prohibit its use for frames, but, otherwise, there is no reason why the rest of the machine should not be manufactured from it.

— ARTHUR GOFFEY.

CURRENT HAT

Times to Light Lamps.

SUMMER TIME.

May 15th	...	9.12 p.m.
" 17th	...	9.15 "
" 19th	...	9.17 "
" 21st	...	9.20 "

The Paris Fair.

We understand that an A.B.C. motor bicycle is being exhibited on stand No. 39 at the Paris Fair, which opened on April 26th. The Paris depot for the sale of this machine is at 39, Rue Auber.

Petrol Imports.

16,090,485 gallons of petrol were imported during April as against 4,645,372 gallons for the corresponding month last year. The total amount of petroleum (which includes petrol, lamp oil, and fuel oil) imported, however, was only half as much as in April, 1918, the quantity being 40,388,128 gallons.

Boche Methods.

We have received an enquiry from a Belgian firm of cycle and motor cycle makers, Etablissements Scaldis, Antwerp. The pathetic nature of the letter will be understood when we point out that the firm are asking for the names of manufacturers of British plating accessories. The Germans stole the whole of their nickel-plating plant, and as they despair of ever getting it back they are turning to Britain to supply them.

Doubtless some Boche is making use of the stolen plant, and rubbing his hands with glee at being able to obtain it so easily. It was by such dirty methods as these that the Germans hoped to win the war and annex the world's trade not only in bicycles and motor cycles, but everything else.

Imports and Exports for April.

The value of motor cycles and parts imported under licence during April amounted to £1,535. In the near future, however, as we have already stated, imports are likely to be greatly increased, and firms will be allowed to import half their 1913 quantities.

EXPORTS.

The comparatively high figures of the March exports of motor cycles and parts were not maintained, in April the amount being £62,076 as against £154,202. But there are several factors that account for this sudden drop, the chief one being the difficulty in connection with transport and shipping.

BRITISH EXPORTS OF MOTOR CYCLES.

April 1917.	April 1918.	April 1919.
£72,824	£63,117	£62,076

A Good Performance.

The new Douglas described recently was a short time ago driven with sidecar and passenger non-stop from Bristol to Porlock, sixty miles, in about two hours, and the hill was taken on the run without a stop. It climbed good and well without hesitation. The days are not far behind us when Porlock Hill was considered unclimbable.

A New French Motor Cycle Paper.

A copy of *Motocyclisme*, a new French motor cycle paper, edited by our friend, M. Gaston Sweerts, 1, Cité Paradis, Paris, is to hand. M. Sweerts is closely in touch with motor cycle affairs both in France and in England, and he pays in his paper a just tribute to the excellence of the English motor bicycle. The paper shows promise, and, if properly supported by the motor cycle trade in France, should be a great success.

Bearing upon Motor Cycles.

Under the heading "Why Bearing Reins are Needed," a letter appears in a daily paper under the name of Mr. Walter Winans, which states that if bearing reins were stopped few coachmen would be able to prevent their horses from running away. He then goes on to say that "motor cycles are allowed to go at railway speed in traffic, with open silencers making a terrific noise, back-firing. I actually saw one man stop his motor cycle in the middle of the road, purposely let off a series of shots like deafening machine gun fire in order to clear his tubes (*sic*), scattering the horses in the road in all directions." It is a little difficult to understand what this well-known sportsman means. Few motor cyclists would deliberately offend in this manner.

Special Features.

BALANCING THE SINGLE.

ART AND THE SIDECAR.

A RUNABOUT WITH FOUR-CYLINDER V ENGINE.

Prices in U.S.A.

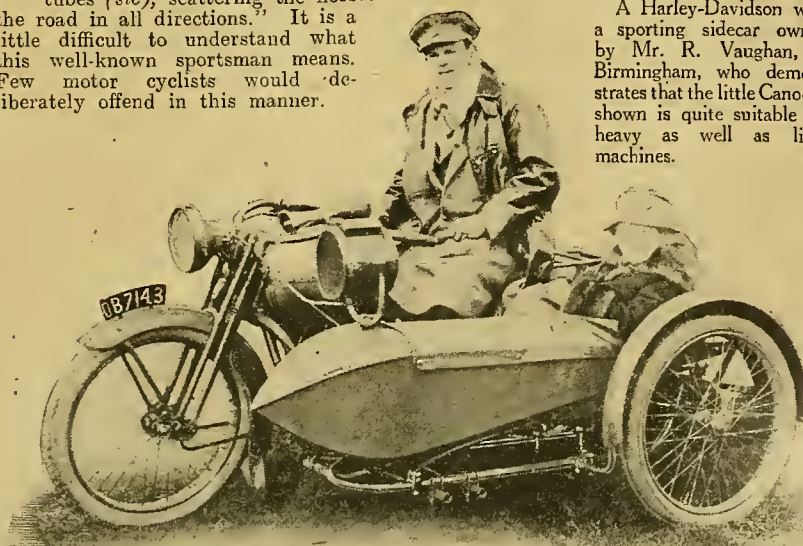
As examples of prices ruling in the U.S.A. to-day we quote those of the Thor motor cycle—a name not altogether unknown in this country. The 16 h.p. (approximating to the big twins of this country) with three speeds is £67 14s., electrically equipped £77 10s. A smaller twin (about 5-6 h.p.) sells at £57 10s., and a big single at £47.

A.A. First Aid.

To assist members having mechanical breakdowns of their cars and motor cycles, the A.A. and M.U. has instituted a service of "first aid" motor cycle combinations. These vehicles are equipped with the necessary tools for dealing with roadside troubles, and are driven by competent mechanics. In addition to spares, covers, and tubes, first aid necessities for personal injuries are carried, also stretchers to enable serious accidents to be promptly dealt with. These machines are working in close conjunction with the A.A. system of roadside telephones, and can be summoned by the patrols in charge of the sentry boxes at the behest of members needing their services.

HEAVY TWIN AND LIGHT SIDECAR

A Harley-Davidson with a sporting sidecar owned by Mr. R. Vaughan, of Birmingham, who demonstrates that the little Canoelet shown is quite suitable for heavy as well as light machines.





Competitors in the Hull Autocycle and Light Car Club's reliability trial held last Saturday.

The Six Days Trial.

We have remarked several times that the leading trials organising bodies might give a fillip to the development of the lightweights by special considerations being given to them in the big trials. We are pleased to observe that the A.C.U. has decided to pay particular attention to low-priced and lightweight machines in the Six Days Trial. It will unquestionably encourage the production of the cheap and moderately priced motor cycle.

Revised Prices.

Several makers have been compelled to raise their prices. The Excelsior two-stroke two-speed is now £58 16s.; with kick-starter, £63; single gear, £50. Four-stroke J.A.P. model two-speed, £60 18s.; with kick-starter, £65 2s. The Douglas 4 h.p. model is £85; with sidecar, £105; 2½ h.p. Douglas, £60. Ivy two-stroke single speed, £45 3s.; two-speed, £53 15s.; I.O.M. sporting models, single speed, £48 7s. 6d.; two-speed, £56 19s. 6d. A.J.S. sidecar, £148; motor cycle only, £110 5s.

New Models in the London-Edinburgh.

Several veteran competition riders will compete in the London-Edinburgh event this year on new models. Hugh Gibson, the old Bradbury rider, and one of the finest exponents of the single-cylinder machine, and also the holder of the Land's End-John o' Groat's record, will drive a new model spring frame Clyno. A. C. Robbins, the winner on an L.M.C. of the Manufacturers' Trophy in the last Edinburgh run, will this year ride the new Wooler flat twin. J. S. Holroyd, of Motosacoche fame, will appear on an 8 h.p. Blackburne with outside flywheel. E. Bridgman will be mounted on the 1919 Indian, Rex Mundy on a Victory Matchless, W. Cooper and E. M. P. Boileau on 3 h.p. A.B.C.'s, and J. Stevens on the latest A.J.S. Jack Haslam, the Sheffield rider, who won a special award by piloting a 3½ h.p. Premier sidecar through the last Six Days, will ride a 4 h.p. Douglas. Almost every new make and new model, it is anticipated, will be represented.

The A.A. and Petrol Licence Refunds.

The Petrol Control Department has authorised the Automobile Association to receive applications for refunds in the case of licences, which, after Saturday next, still contain unused vouchers.

The Zenith Flat Twin.

The Zenith Co. is the latest aspirant to the flat twin market. A new 2½ h.p. opposed model with the Gradua gear will be introduced this year, and probably will have a pressed steel frame on the lines of the Zenith design already described.

Accessibility.

"The word 'accessibility,'" said Mr. E. Tilston, at a recent meeting of the I.A.E., "should be posted all over the premises of motor cycle manufacturers, even at the risk of the workers taking to themselves the assumption that the managing director should be more get-at-able in future and listen to their grievances.

More Government Sales.

On Saturday week there will be the first of an important series of auction sales of Government motor vehicles, which will be held through May and June at the Royal Agricultural Hall, Islington.

We understand from the auctioneers, Messrs. Goddard and Smith, 196, Piccadilly, London, W.1, that some hundreds of motor cycles will be put up for auction. The sales are to be held on Saturday, so that all motor cyclists will have an opportunity of attending.

British Industries Fair at Birmingham.

With the object of maintaining and extending British trade, a British industries fair is to be held in Feb., 1920. This exhibition will be of a different nature from anything yet attempted in this country, and will be held in every available building in the city and, if necessary, a series of kiosks and stands will be erected in the squares and main streets. About twenty different industries will be represented, including a section embracing motor cycles, cycles, and cars.

The Motor Cycle Industry and the Board of Trade.

The Coventry Chamber of Commerce is making energetic efforts to reduce the present high rates on passenger train goods traffic, which is hampering the development of commerce throughout the country, and Mr. Marwood, permanent secretary to the Railway Department of the Board of Trade, has offered to place the matter personally before Sir Albert Stanley, the President. It will be remembered that, last month, Mr. Edward Manville, M.P., on behalf of the Chamber, was able to remove the restrictions on the conveyance of motor cycles by passenger train, by taking the matter up with Sir Herbert Walker, acting chairman of the Railway Executive Committee, which signifies that the Government apparently now appreciate the importance of the motor cycle industry.

A Strenuous Trial.

The Midland Cycling and Athletic Club One-day Trial fixed for Saturday, June 28th, is, by all accounts, to be quite a strenuous affair. The course has been fixed at not less than 200 miles, and a great deal of country unknown so far as trials are concerned will be traversed.

Into the conditions will be introduced flexibility hill climbs and brake tests, special attention being given to the latter point, and failure on such tests will mean total elimination.

A novel feature will also be introduced, by checking times to the police regulation limit through one of the county towns *en route*. This will be done in order to show that the present limit of ten miles per hour is probably more dangerous to the general public and motor cyclists than a reasonable speed.

London-Edinburgh Entrants to Date.

The list of entrants for the London-Edinburgh run at Whitsuntide continues to grow. Quite a large number of competitors will ride new models produced since the Armistice.

SOLO.

W. Cooper (3 A.B.C.).
W. C. Hemy (2½ Metro-Tyler).
A. C. Robbins (2½ Wooler).
R. L. Williamson (4 Triumph).
Fred Notari (4 Triumph).
N. Fyercoll (4 Triumph).
G. A. Reed (2½ Coulson B.).
E. M. P. Boileau (3 A.B.C.).
R. C. Boxer (4 Triumph).
J. T. Ross (4 Triumph).
P. W. Moffat (spring frame 3½ Douglas).
A. Cocks (2½ Clyno).
T. H. Weaver (2½ Sirrah-Venus).
Tudor Thompson (2½ Douglas).
J. A. Watson-Bourne (4 Blackburne).
R. T. Leather (2½ Douglas).
H. E. Walker (2½ Hobart).

PASSENGER.

J. Emerson (3 A.B.C. sc.).
J. S. Holroyd (8 Blackburne sc.).
Thompson-Thompson (4 Douglas sc.).
G. A. Bridgman (7 Indian sc.).
Rex Mundy (8 Matchless sc.).
James McKenzie (6 Humber sc.).
A. Mabon (4 Mazon sc.).
W. A. Fell-Smith (7 Harley-Davidson sc.).
J. Stevens (6 A.J.S. sc.).
R. C. Davis (8 Chater-Lea sc.).
J. Haslam (4 Douglas sc.).
F. D. Walker (4½ B.S.A. sc.).
J. L. Stocks (3½ Ariel sc.).
Gordon Fletcher (4 Douglas sc.).
H. H. Saddington (5-6 James sc.).
Hugh Gibson (8 Clyno sc.).
T. C. Delabay (3½ Sunbeam sc.).
W. B. Gibb (3½ Douglas sc.).
T. H. L. Witt (6 Enfield sc.).
E. G. Johnson (4 Douglas sc.).

CYCLE CARS AND LIGHT CARS.

F. Smith (10 Clyno).
G. A. Nash (10 G.N.).
Hay (10 G.N.).
G. G. Blakey (9.5 Hillman).

A RUNABOUT WITH A FOUR-CYLINDER V ENGINE.

A New Four-wheeler to weigh 6 cwt. which will be fitted with a Four-cylinder 500 c.c. Sleeve Valve Two-stroke Engine.



The Parr-Eagle runabout as it will appear when completed.

EMBODYING a diminutive four-cylinder engine of less than 500 c.c. total capacity, the runabout illustrated has been designed to approximate to the de luxe sidecar on the points of weight and cost.

This new vehicle will be known as the Parr-Eagle "twin-two ten," as its engine will be of the V type with four cylinders, a twin-two, in fact, and the nominal horse-power is to be ten.

As the drawings indicate, the layout is attractive, and the general appearance of the finished car will be quite good.

With a pressed steel frame, sheet metal body, 30x3in. tyres, and pressed steel-domed mudguards and running boards, the weight is to be 6 cwt. only. Castings will be employed at no other points than in the engine, the car being built almost exclusively of pressed steel. The whole design, in fact, has been produced to embody the following features, which are given in the order of their importance in the estimation of the makers:

(1.) Applicability to cheap quantity production. (2.) Economy in running, which is to compare favourably with a good sidecar. (3.) Reliability: to run at least twelve months without any attention whatever. (4.) Foolproofness: to be incapable of being damaged by bad driving.

Air-cooled Four-cylinder Engine.

The engine is described as an 8-10 h.p. (nominal), high speed, high efficiency, air-cooled four-cylinder, twin-two, sleeve valve two-stroke. With a bore and stroke of approximately 52 and 59 mm. respectively, the total capacity is under 500 c.c., and the car will come inside the

two guinea tax. We are not permitted to give full details of the engine; it must suffice to say that it has a high compression and forced induction, and is said to be completely scavenged and internally cooled.

According to present day standards, an engine of this size appears absurdly small for even a 6 cwt. vehicle, but we know that a 11 cwt. light car has been running about the London district for the past three years which is fitted with a similar engine.

Roller bearings are to be fitted in the big ends, and the 90° crankshaft is of the built up type. Die cast aluminium pistons, too, are to be fitted.

Double Ratio Intermediate Drive.

The designers of the Parr-Eagle runabout considered that friction transmission has so many advantages over the gear set method of ratio variation that an endeavour to eliminate its more outstanding faults was amply justified. Briefly, these faults in friction drives, as usually applied to automobiles (industrial drives are generally quite satisfactory), are: Short life of friction composition, inefficiency, and low starting torque.

The first two faults mentioned are caused almost entirely by the high pressure between the discs necessitated by the small reduction possible in the final drive, while the third is due to the reduction in the coefficient of friction when slip is occurring.

In this vehicle these disadvantages are reduced by the incorporation of a double ratio final drive, which decreases the

torque on the driven friction gear on low gears, when slip is most liable to occur.

A clutch is fitted in the flywheel in order to obtain a high starting torque, and also to avoid the additional wear on the friction discs when they are used for this function, as is almost general practice.

From the dry plate clutch in the flywheel the power is transmitted through a shaft having two fabric universals to the friction set which more or less follows conventional practice. From the cross-shaft carrying the driven friction wheel two silent chains transmit the drive to a second cross-shaft which has dog clutches for engaging one or the other of the silent chain transmissions as required. These have different ratios giving two speeds without the use of the friction set as a variable gear, hence the lower speeds provided by the friction discs alone are not required. The final drive is by roller chain to a live axle.

The friction discs and dog clutches are all operated by one lever moving in a gate, while the clutch pedal first releases the clutch and then withdraws the disc. Three forward speeds and a reverse are provided, and an under screen encloses the whole of the mechanism.

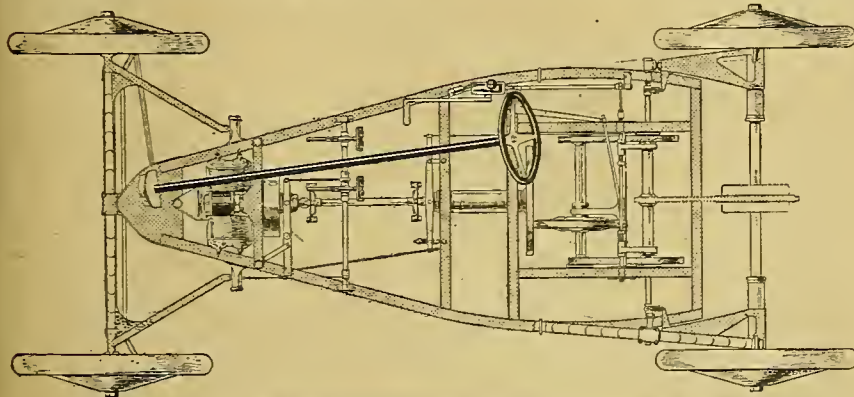
Two further features worthy of mention are the seat starter, which is said to be smooth and silent in action, and the proposed lighting set, of which the dynamo may be of the "flywheel" type.

Front Wheel Brakes.

A transverse spring is used at the front and "compensated" cantilever springs at the rear which will be seen in the accompanying drawings. The front axle is of pressed steel elliptical in section, and brakes, enclosed in oil tight housings, are fitted to each front wheel. The rear axle is tubular with the driving spocket and brake drums at the centre, substantial radius rods being embodied to take side, driving, and braking stresses.

The wheels are of the pressed steel disc type with detachable rims, and steering is by 14in. wheel and irreversible gearing. The wheelbase of the vehicle is 8ft. and the track 4ft.

Altogether the Parr-Eagle is a design of great interest at the present time, and no doubt its development will be eagerly watched. We hope to avail ourselves of an invitation to try one of the experimental chassis which are to be produced during the summer, when the performance



Plan view showing the miniature engine and details of the friction drive.

A Runabout with Four-cylinder V Engine.— of the miniature engine will be duly recorded in *The Motor Cycle*.

In the meantime, it may interest readers to know some of the considerations which led the Parr-Eagle Co. to adopt the V four-cylinder two-stroke as a power unit, and below we give the designers' statement on this point:

"It was considered that for the purpose under discussion an engine should embody the following features, in the order of importance given:

"(1.) Fuel efficiency (above every other consideration).

"(2.) Reliability.

"(3.) Cheapness of manufacture.

"(4.) Simplicity.

"(5.) Absence of vibration.

"(6.) Lightness.

"Considerations (3) and (4) indicated a two-stroke cycle as desirable, but (1) precluded the use of the Day cycle, which is basically inefficient.

"It therefore seemed that a new cycle or an adaptation of an existing one was necessary. A two-stroke modification of a cycle devised by Sir Dugald Clerk was finally decided on as satisfying the conditions laid down in (1), (2), (3), and (4).

"Consideration (5) gave considerable trouble, as a 180° twin two-stroke was abortive, owing to the uneven torque obtained. It was noticed, however, that the adaptation of a cylinder to embody the cycle referred to above had resulted in a design that in a 90° engine would give a mechanism in which only the quite negligible fourth harmonic was unbalanced.

"A 90° two-cylinder, however, gives a very erratic torque curve, and it was therefore decided to employ a four-cylinder two-crank design, as this gives four equally spaced power strokes per revolution (equivalent to an eight-cylinder four-stroke).

"Theoretically, the design gives unbalanced stresses one-forty-sixth of the magnitude of those obtained in a four-cylinder four-crank vertical of the same cylinder capacity, and one-sixteenth of those in a 90° two-cylinder, but practically the balance is considerably better than in a 180° twin of the same power.

"Owing to the very high overall efficiency inherent in the cycle (about 20 h.p. litre=50 c.c. per h.p. at normal speeds), the engine can be made very small, thus satisfying condition (6)."

TWO MORE MOTOR SCOOTERS.

Recent Patents in Great Britain and U.S.A.

IN all probability the revenue of the Patent Office during the next few months will be increased by fees for patents relating to motor scooters. Apparently the interest in this type of machine is not confined to this country, and inventors in the land where the Auto-ped is produced are endeavouring to design scooters, some of which leads one to suppose that there are others besides *The Motor Cycle* who ask the question, Why stand?

On this page we illustrate one of the latest American designs, which incorporates a Smith Auto-wheel and a sprung bucket seat. This is the subject of a patent granted to Mr. Jas. J. Dragner, of New York City, and shows that only a narrow margin exists between the motor scooter and the lightweight on orthodox lines, as, so soon as a seat is fitted, it becomes a miniature motor cycle.

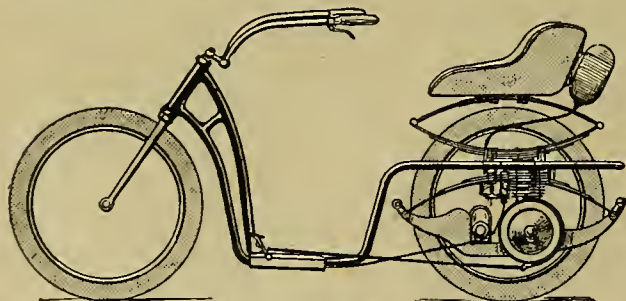
Thus it would seem that if the motor scooter is to secure a place in the world of mechanics as a separate type of vehicle, it must remain a scooter pure and simple, and its one point of advantage over the lightweight motor cycle, i.e., compactness, must outweigh the points of superiority of the slightly larger vehicle with its higher power and greater sphere of utility.

An English Design.

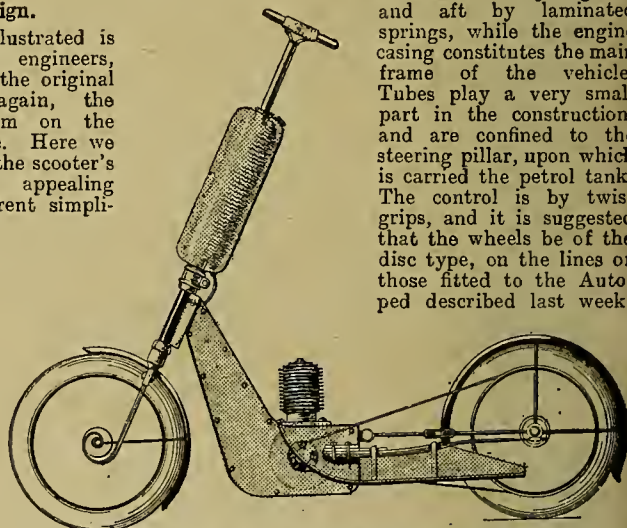
Another invention illustrated is the patent of London engineers, and conforms more to the original scooter idea, but again, the design invites criticism on the points mentioned above. Here we have a scooter without the scooter's greatest and most appealing feature, viz., its apparent simplicity.

The inventors state that "preferably the rear wheel is driven by a belt, and a torque rod, having a right and left-hand screw to enable its length to be adjusted to the belt tension, is provided to keep the driving wheel in position. . . . By disconnecting the torque rod, the rear wheel can be removed without altering the adjustment of the bearings thereof."

It will be seen that the machine is intended to be sprung fore and aft by laminated springs, while the engine casing constitutes the main frame of the vehicle. Tubes play a very small part in the construction, and are confined to the steering pillar, upon which is carried the petrol tank. The control is by twist grips, and it is suggested that the wheels be of the disc type, on the lines of those fitted to the Auto-ped described last week.



An American design that incorporates a Smith Auto-wheel as the power unit.



A British patent which conforms more to the lines of the original scooter than many recent designs have done.

THE BIRMINGHAM-LAND'S END WHITSUNTIDE TOUR.

SECOND in importance only to the London-Edinburgh run, the Birmingham M.C.C. Whitsuntide trial to Land's End and back for the Lycett Trophy has always been a popular event, especially with Midland riders. Particulars of this event are now available. The start will be from Birmingham on Saturday, June 7th, returning from Penzance on the following Tuesday. This gives the competitors two clear days' rest between the two journeys. The route outwards will be Birmingham, Stroud, Bath, Bridgwater, Minehead, Porlock,

Lynton, Blackmore Gate, Barnstaple, Launceston, Bodmin, Penzance, Land's End, and the return journey Penzance, Liskeard, Tavistock, Two Bridges, Ashburton, Exeter, Taunton, Bath, Stroud, Birdlip Hill, Cheltenham, Evesham, Birmingham.

The Lycett Trophy and gold medal will be awarded to the competitor who makes the best performance, and all competitors who are not more than 2m. early or late at any check, and who climb the observed hill, will receive a gold medal. Those who fail to gain a gold

medal, but who are not more than 4m. early or late at any check, will be awarded silver medals, and bronze medals to all who complete the outward or return journey within 45m. of schedule time.

Marks will be awarded for the Austin Challenge Cup, and photographs taken on this run are eligible for a photographic competition instituted by the club.

Applications for membership of the B.M.C.C. should be made to the hon. secretary, Mr. W. H. Egginton, 76, Earlsbury Gardens, Birchfield, Birmingham.

TWO-STROKE ENGINES FOR MOTOR CYCLES.



Review of a Paper read by Mr. E. Tilston before the Institution of Automobile Engineers.

WITH Mr. A. A. Remington in the chair, the Institution of Automobile Engineers held its last meeting of the session at Birmingham on Thursday of last week, when Mr. E. Tilston, designer of the Tilston piston valve engine, read a paper on "Two-stroke Engines for Motor Cycles."

Among those present we noticed several designers of two-stroke engines, including Messrs. W. Hughes Butterfield, G. Funck, W. L. Lechmere, J. Duffy, and G. E. Stanley, while Messrs. J. E. Greenwood, W. W. Bowkett, A. E. Parnacott, J. L. Norton, and many other well-known figures in the trade were present.

The author's opening remarks were full of optimism concerning the future of the two-stroke engine, which, he stated, will be suitable for all types of motor cycles, cars, and aeroplanes when the right design arrives.

"To commence with," Mr. Tilston continued, "it is perhaps as well to enumerate the advantages which designers of internal combustion engines look for in determining the type of engine to adopt."

1. *Power per c.c.*
2. *Torque.*
3. *Reliability.*
4. *Good balance.*
5. *Absence of vibration.*
6. *Simplicity.*
7. *Low cost.*
8. *Economy of fuel.*
9. *Ease of starting.*
10. *Accessibility.*
11. *Flexibility.*
12. *Best type of engine for frame design.*

13. *Light weight.*
14. *Silence.*
15. *Durability.*
16. *Cooling.*

The exponents of the two-stroke engine claim that the twelve advantages which appear in *italics* are found in this type of engine.

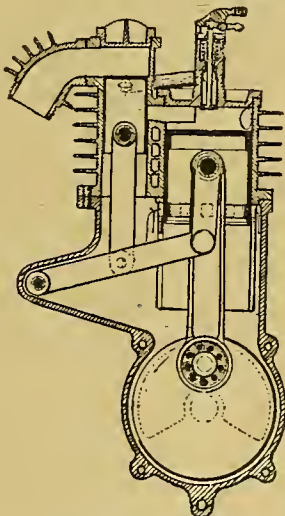
The present type of three-ported two-stroke engines gives about one-third more power than the four-stroke engine for the same size of cylinder with the engine revolving at normal speeds, although the power curve falls away more rapidly than with the four-stroke engine at abnormal speeds.

The two-stroke engine appears to be the best type for frame design, inasmuch as torque and balance (which minimise vibration), total weight, and weight of reciprocating parts are in its favour.

Reliability.

There can be no doubt that the present-day two-stroke engine is very unreliable for large horse-powers. In the first instance, it is necessary to bear in mind

that there are two power impulses against one in the four-stroke engine, consequently the moving parts, especially the piston and small end of the connecting rod, are more likely to get over-heated. This is counterbalanced to a certain extent by the fact that a new cool carburetted charge is drawn into the crank case every revolution; this lies inside the piston, and tends to keep these parts cool. In the present-day two-stroke engine there are other reasons for overheating, viz., the exhaust port is arranged at the lower end of the cylinder, and the hot burnt gases do not tend to escape, consequently the piston in ascending is subject to the heat from the exhaust. It must be admitted that even in small two-stroke engines of 250 c.c. it frequently happens that the engine peters out on a fast run of fifty miles or so. For further proof



The Tilston air-cooled two-stroke engine, with piston valve controlling exhaust port at top end of cylinder, the displacement of which helps the main piston to fill cylinder with new charge.

of the evil effect of exhausting at the lower end of the cylinder, it is only necessary to examine the top piston rings on the exhaust side of any two-stroke engine, and they will be found caked up with carbon, and often require cutting out after a few hundred miles run. To sum up, the disadvantages of exhausting at the lower end of the cylinder are as follows:

Loss of incoming charge through the exhaust; imperfect scavenging; overheating of the piston, which is increased by the deflector; and caking of piston rings

with carbon on the exhaust side, all of which add considerably to unreliability and waste.

Economy and Flexibility.

The large difference in economy of fuel between the present-day two-stroke engine and the four-stroke engine is no doubt due to the loss of incoming charge through the exhaust, combined with the large amount of burnt gases in the cylinder. Remove these two evils, and there is no reason why the two-stroke engine should not equal the four-stroke engine as regards economy.

It would naturally be imagined that the two-stroke engine would be more flexible than the four-stroke engine, seeing that a single-cylinder two-stroke engine is equal in power impulses to a two-cylinder four-stroke engine, and there can be no question but that by increasing the number of cylinders flexibility is improved. In the author's opinion, the reason why the two-stroke engine is actually not more flexible than the four-stroke engine is that there is a greater amount of exhaust gas left in the cylinder on the compression stroke than is found in the four-stroke engine. If all the exhaust gases can be ejected from the cylinder, at every position of throttle opening, the flexibility would increase in proportion to its superior torque.

The following are points that are desirable and those that are best got rid of:

Undesirable.

The deflector on the top of the piston.
The exhaust at the lower end of the cylinder.

Valves.

The waste of the incoming charge through the exhaust.

Desirable.

The cylinder scavenged from end to end through a ring of ports and an annulus.

A light flat topped piston.

The incoming charge must fill the cylinder completely with the throttle fully open.

No exhaust left in the cylinder at any position of the throttle.

Both inlet and outlet must be unobstructed to allow free passage, otherwise back pressure of the outgoing exhaust prevents the new charge from entering, and diffusion of the two results in the escape of the new charge through the exhaust. If these ideals are accomplished, it is possible to double the power as compared with the four-stroke engine for the same c.c.

The combustion space represents roughly 20% of the cylinder volume, and if this could be filled with a new charge and fired twice, as compared with the

Two-stroke Engines for Motor Cycles.—

combustion space in the four-stroke engine, which is filled with burnt gases and fired once, then the possibility of increasing the power of the two-stroke engine may be more than doubled.

The two-stroke engine for which the author is responsible is the result of very careful consideration of the merits and demerits of both types of engines on the lines laid down.

In this engine means are provided to control the exhaust port (the piston valve) which gives additional displacement to induce a sufficient charge into the crank case from the carburetter, which the movement of the piston alone fails to accomplish.

The Principle of the Piston Valve.

The lower end of the piston and piston valve are both open to the crank case, and as they move upwardly together, their combined displacement is available to fill the cylinder at the end of the next downward stroke of the piston. On the explosion stroke, the closing of the port from the carburetter to the crank case first occurs, followed by compression of the charge in the crank case. The opening of the exhaust at the top end of the cylinder follows, and shortly afterwards the inlet ports from the crank case to the cylinder are opened by the main piston.

When the explosion takes place, the piston valve is at the top of its stroke and is considerably above the combustion space. The cool carburetted charge, introduced into the crank case every revolution, lies not only inside and around the main piston, but also inside the piston valve, and as there is only a thin wall of metal separating the hot explosion from the newly introduced cool charge, the excessive heat from the former is absorbed by the charge, which is afterwards passed into the cylinder, thus cooling the piston valve and preventing dissipation of heat from the outside. This helps the petrol consumption and aids in an easy start.

The top rings of the main piston maintain their elasticity under severe loads and constant running far better than is found to be the case in the usual four-stroke engine. This is due to the fact that the piston in the two-stroke engine is cooled internally every revolution, whereas in the four-stroke engine there is no fresh air introduced inside the crank case. The piston valve is operated by link motion from the gudgeon pin, with about half the



A scene in the paddock at Newmarket races. Sidecars were well in evidence; modern outfits were parked side by side with the oldest possible.

stroke of the main piston, but there are several ways in which the piston valve can be reciprocated.

The lubrication of the piston valve does not appear to give any trouble. In the first experimental engine the petrol system was adopted, and gave excellent results. Probably, however, an oil mist is the best system of lubricating the piston and piston valve.

The author is of the opinion that a single-cylinder two-stroke air-cooled engine designed on the lines laid down is the type for lightweight motor cycles, whilst a similarly designed two-cylinder vertical two-stroke engine is the ideal for sidecars.

Among those who challenged some of the author's remarks were: Messrs. Butterfield, J. Duffy, G. Funck, and D. S. Heather. Mr. Duffy thought Mr. Tilston's references to the three-port type of engine were exaggerated, and said that carburetters were more to blame for lack of economy than the principle of the engine. A carburetter for two-strokes was badly needed, and after experiments with one of the wick type he appeared to be of the opinion that possibilities lay in this direction.

Mr. Funck pointed out that the three-

port two-stroke has decided advantages, among which he mentioned its simplicity, reliability, and cheapness, while another speaker quoted 37% as the amount of mixture lost through the exhaust port. It was also stated that the very simplicity of the type was hindering progress. Mr. Heather mentioned 50 lb. as the mean effective pressure of the average two-stroke, and also that the length of the power stroke was not the length of the piston travel owing to the opening of the exhaust port. This speaker did not think that it was possible to make a really satisfactory type of carburetter for the three-port two-stroke.

No Answer to Critics.

In replying, Mr. Tilston referred to the success of the two Levis machines in the recent Victory Cup Trial, and congratulated the makers and riders upon the very fine performance. He, however, refrained from answering his critics, and promised to do so at a future date.

It appears that since the Tilston engine was demonstrated to the press some time ago other and improved models have been made, and are undergoing tests by important manufacturers.

HILL-CLIMBING IN THE PEAK DISTRICT.

WITH a gradient in one part of 1 in 2½, and numerous hairpin bends, Jenkins Chapel in the Peak District was often the venue for hill-climbing parties before the war, and one of the first events of the Oldham and District M.C. after its revival was a revisit to demonstrate the skill of its members in scaling the hill.

This event took place last week, and, owing to the heavy fall of rain the evening before, speculation was rife as to the possibility of any rider surmounting the summit. The hill is 283 yards long, averaging about 1 in 4. The first stretch is reputed to be 1 in 3½, the second 1 in

2½, third 1 in 4, and, finally, a stretch of 1 in 4½, and there are four sharp bends.

E. Bottomley, a daring young solo rider of a Harley-Davidson, was the first to assail the hill, and the manner and speed at which he made the ascent evoked astonishment. J. Davenport, on a 4 Triumph three-speed followed at a more steady speed and succeeded in reaching the top without touching the ground with his feet. These two riders caused some amusement and excitement by descending to the base, which was quite a difficult undertaking.

H. Bottoms (6 Bradbury) next attempted to climb the hill with two passengers,

but only succeeded in reaching the summit without them. J. Bottom (4 Triumph) was the first rider to scale the hill with a passenger, while another sporting sidecarist, with a single geared machine, disconnected his sidecar and successfully climbed the hill.

Many others attempted the climb, but few succeeded, and the honours of the day were shared by the Triumphs and the Harley-Davidson.

Bottomley and Davenport succeeded in making clean ascents five times in succession, and any northern rider who knows this hill will appreciate that they were very fine performances.

**Glasgow M.C.C.**

Arrangements are well forward for the hill-climb on the 24th inst. The hill will not be made known until the day of the event.

Hull A.C. and L.C.C.

The first competition of the year was run on Saturday last. The circular course included Hull, Hershle, Ferriby, S. Carr, Market Weighton, Beverley, and back to Hull.

Grimsby and District M.C. and L.C.C.

Grimsby and district motor cyclists interested in club life should communicate with the secretary of the local club, Mr. M. Jennison, 114, Victoria Street, Grimsby.

Hamilton and District M.C.C.

It is proposed to hold a general meeting of the above club to-night (the 15th) at the Commercial Hotel, Hamilton, at eight o'clock. All motor cyclists in the district are invited to attend. Hon. sec., Mr. J. F. Bowness, Reith Cottage, Hamilton Road, Motherwell.

N.M.C.F.U. (Wolverhampton).

The Wolverhampton branch of the N.M.C.F.U. are holding their first social run on the 18th inst., the trip being to Wellington, Salop, where tea will be taken. It is hoped that every member of the branch will make a special effort to attend.

Redditch and District M.C.C.

Energetic measures are being taken to make this club a success, and interested motor cyclists in the Redditch district, of which there are quite a large number, should communicate with the hon. secretary, Mr. F. G. Jenkins, Cuenca, Ease-more Road, Redditch.

Northamptonshire M.C.C.

The above club has been re-organised and restarts with substantial funds in hand, in addition to which the club has three valuable silver cups for competition. Northampton motor cyclists wishing to join the club should communicate with Mr. J. B. Sneath, 3, York Road, Northampton.

Liverpool M.C.

Twenty members took part in the social run to Llandudno, eleven of whom took part in the speed-judging competition. The following are the result:

1. — Chapman (3½ Zenith), 17 m.p.h., 19s. error.
2. N. H. Brown (7-9 Indian), 20 m.p.h., 47s. error.
3. T. Lane (6 A.J.S.), 18½ m.p.h., 54s. error.
4. W. Pohjoy (6 A.J.S.), 16 m.p.h., 58s. error.
5. — Cottle (2½ Calthorpe), 18 m.p.h., 58s. error.
6. — Zacharias (6 Sunbeam), 19½ m.p.h., 68s. error.
7. — Honeyman (4 A.J.S.), 16 m.p.h., 69s. error.
8. — Wilkins (3½ Sunbeam), 17 m.p.h., 1m. 54s. error.
9. — Pollard (2½ Douglas), 19 m.p.h., 3m. 33s. error.
10. — Bell (3½ Rudge Multi), 17½ m.p.h., 4m. 31s. error.

Future Events.

- May 15.—Hamilton and District M.C. General Meeting Commercial Hotel, Hamilton, at 8 p.m.
- May 15.—Tredegar and District M.C. Hill-climb at Fiddler's Elbow.
- May 17-18.—Birmingham M.C.C. Week-end Touring Competition to Llangollen.
- May 17.—Liverpool M.C. Social Run to Llangollen.
- May 17.—Luton and Beds. A.C.—Opening Run.
- May 17.—N.M.C.F.U., Leeds. Invitation Run to Keadby.
- May 17.—N.M.C.F.U., Sheffield. Run to Hatfield.
- May 17.—S. Birmingham M.C.C. Run to Stratford.
- May 17.—Sutton Coldfield A.C. Half-day Trial for Levis Cup.
- May 17.—Woolwich, Plumstead, and District M.C.C. Open Trial for Matchless Cup.
- May 17.—York and District M.C. Paper-chase.
- May 18.—Carlyle C. and M.C. (Chelsea). Run to Dorking.
- May 18.—Eastern Counties M.C. Run to Bedford.
- May 18.—Ilkeston and District M.C.C. Run to Surfleet.
- May 18.—N.M.C.F.U., Birmingham. Run to Yarnington Common.
- May 18.—N.M.C.F.U., Sheffield. Run to Longnor.
- May 18.—Wolverhampton N.M.C.F.U. Social Run to Wellington, Salop.
- May 18.—Woolwich, Plumstead, and District M.C.C. Inter-team Trial.
- May 21.—York and District M.C. Reliability Trial.
- May 21.—Harrogate and District M.C.C. Social Run to Pateley Bridge.
- May 24.—Coventry and Warwickshire M.C. Manville Cup Trial.
- May 24.—Birmingham M.C.C. Social Run.
- May 24.—Glasgow M.C.C. Hill-climb.
- May 24.—Oldham and District M.C. Reliability Trial, Heyden Bridge.
- May 24.—Sheffield and Hallamshire M.C.C. Competition for Dickenson and Darwen Cup.
- May 25.—Eastern Counties M.C. Run to Newlands Corner.
- May 25.—Ilkeston and District M.C.C. Run to Quorn.
- May 25.—Liverpool M.C. Social Run to Blackpool.
- May 25.—North Derbyshire M.C.C. Run to Edwinstowe.
- May 25.—Rochester, Chatham, and District M.C. Run to Margate.
- May 25.—S. Birmingham M.C.C. Run to Bromyard.
- May 25.—N.M.C.F.U., Sheffield. Run to Glossop.
- May 31.—N.M.C.F.U., Sheffield. Run to Edwinstowe.
- May 31.—S. Birmingham M.C.C. Reliability Trial.

- June 1.—Harrogate and District M.C. Reliability Trial.
- June 6.—Essex Motor Club. Midnight Ride to Yarmouth.
- June 6-7.—M.C.C. London-Edinburgh Run.
- June 7-9.—Birmingham M.C.C. Trial to Land's End.
- June 9.—Cork and District M.C.C. Twenty Hour Reliability Trial.
- June 9.—Liverpool M.C. Open Reliability Trial.
- June 25.—Essex Motor Club. Speed Trials at Southend.
- August.—A.C.U. Six Days Reliability Trials.

The Proposed Colchester Club.

With reference to our paragraph regarding the formation of a club in Colchester, Mr. Edmond T. Elliott, who was an enthusiastic clubman before the war, writes that he will be pleased to act as trials secretary if such a club is formed. His address is c/o Egerton's, Northgate Street, Ipswich.

Purley and District M.C.C.

An effort is being made by Lt. C. A. H. Mason, 3, Queen's Road, Wallington, Surrey, who is undertaking this work in the absence of the hon. sec., who is still engaged on military duty, to start the Purley and District M.C.C. Lt. Mason will be pleased to hear from past members of this club and from those who would care to join.

South Birmingham M.C.C.

The next runs will be to Stratford and Bromyard on the 17th and 25th inst. respectively. The club reliability trial has been arranged for the 31st inst., entries for which should be sent to Mr. Roberts, 25, Cumberland Street, Broad Street, Birmingham. Hon. sec., Mr. E. Boydell, John Bright Street, Birmingham.

Rochester, Chatham, and District M.C.

An inter-meet with the Blackheath and District M.C.C. is being arranged in conjunction with the run to Margate on the 25th inst. or the run to Hawkhurst on June 1st. Particulars of the club holiday at Whitsuntide will shortly be announced. Badges are now obtainable for 4s. 6d. from the hon. secretary, Mr. S. White, 3, South Avenue, Rochester.

York and District M.C.

The results of the slow hill-climb at Garrowby are as follows:

SOLO.

1. Maj. G. Jefferson (4 Triumph).
2. P. Payne (3½ Ariel).
3. G. A. Walker (4 Triumph).

SIDECARS.

1. C. Potter.
2. W. E. Haddon (6 A.J.S.).

IMPROMPTU RACE.

1. C. R. Todd (8 Martin-Japi).
2. G. Hannen (8 Harley-Davidson).

THE M.C.C.'S SPEED-JUDGING CONTEST.

Successful Opening of the
Social Programme by a
Prominent Club.

THE first road event held by the Motor Cycling Club since the Armistice was a speed-judging trial, run over a course near Potters Bar on Saturday last.

The start took place about a mile from the junction of the Goff's Oak and Northaw Road to the Great North Road, and the route was a circular one about five miles in extent. Each circuit had to be covered three times, the first time at 16½ m.p.h., the second at 18½ m.p.h., and the third at any speed between 10 and 20 m.p.h. the competitor decided to declare. Altogether there were eighteen entrants, and of these nine rode motor bicycles and nine were down to compete as passenger motor vehicles, which included cars.

All the motor bicycle entrants started, but one driver of a sidecar outfit and two car drivers failed to put in an appearance. Among the competing machines we noticed a 3½ h.p. T.T. Rudge-Multi, a brand new 3½ h.p. Sunbeam beautifully finished and of most handsome appearance, one of the new Metro-Tylers, and a new flat twin Wooler. Of the officials present Mr. Robert Head, chairman of the M.C.C., acted as chief marshal, Mr. F. T. Bidlake was the timekeeper, and Mr. W. H. Wells did valuable work in taking him round the course so as to fix the arrows in position. Altogether it was an exceedingly pleasant afternoon—the rain held off, the roads were fairly good and not dusty, and the temperature was just right.

A start was made at about 3.15 p.m., and the leader of the competitors was A. C. Robbins on the new 2½ h.p. Wooler. We started soon after, endeavouring to keep to the prescribed speed. Speedometers and watches were allowed, but we carried neither, and our guessing proved to be somewhat wide of the mark. Two



Scene at the start of the M.C.C.'s speed-judging contest which took place last Saturday.

competitors passed us after the start, and the rest of the trip was made alone.

The route lay along the Ridgeway, with the Great Wood on the left looking perfect in its garb of fresh springtime verdure, straight along to Cuffley, passing the field where the first German airship (not a Zeppelin but a Schütte-Lanz) was brought down on English soil in

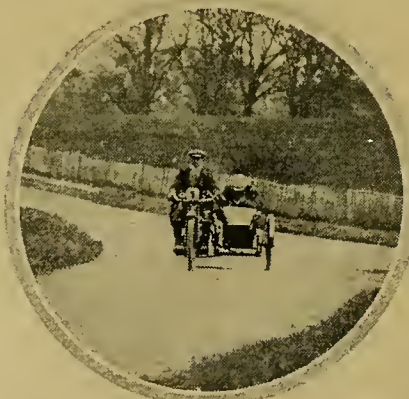
1916, leaving Cuffley station on the left, and straight on through pretty Northaw village, including a sharp rise, then round to the right and back to the start. The road surface was fair on the whole, but bumpy beyond Northaw. Southcomb May (hon. sec., M.C.C.) retired on the second lap, otherwise the event was without incident.

At the conclusion the competitors proceeded to the Old Salisbury Hotel, Barnet, where an excellent tea was served, and the results were announced as follow:

MOTOR BICYCLE CLASS.

1. M. L. Luigi (4¼ B.S.A.), error 57s.
2. W. C. Hemy (2½ Metro-Tyler two-stroke), error 1m. 20s.
3. V. Olsson (4 Douglas), error 1m. 21s.
4. S. C. Selby (3½ Rudge), error 1m. 55s.
5. A. C. Robbins (2¼ Wooler), error 2m. 2s.
6. J. E. Hull (2¼ Wooler two-stroke), error 2m. 5s.
7. R. H. May (4¼ B.S.A.), error 2m. 10s.
8. E. M. P. Boileau (3¼ Sunbeam), error 2m. 20s.

In the passenger class W. H. Wells's car made the best time of the day, as his error was only 47 sec. The best sidecar was J. A. Masters's 7 h.p. Harley-Davidson, which finished third, error 2 min. 7 sec.; E. Bridgman's 7 h.p. Indian sc. was fifth, error 3m. 14 sec.; while A. Mabon's 3½ h.p. Mabon sc., was sixth, error 3 min. 43 sec.



A competitor in the M.C.C. trial. E. Bridgman on his 7 h.p. Indian.

To Commemorate a Pioneer.

Birmingham Scheme to Perpetuate the Memory of James Watt.

BIRMINGHAM, the home of so many great enterprises in the engineering world at the present time, was the city where the great James Watt spent most of the working years of his life, and where he died in retirement at the age of 83. The centenary of Watt's death occurs in August next, and it is only fitting that Birmingham should desire to perpetuate his fame in a worthy and lasting manner. To this end a meeting was convened at the Council House, Birmingham, on the 8th inst., under the presidency of the Lord Mayor, to propose resolutions that the centenary should be marked in the following manner:

(1.) To endow a Professorship of Engineering, to be known as the James Watt Chair, at the Univer-

sity of Birmingham, for the promotion of research in the fundamental principles underlying the production of power, and the study of the conservation of the natural sources of energy.

(2.) To erect a James Watt Memorial Building, to serve as a museum for collecting together examples of the work of James Watt and his contemporaries, Boulton and Murdoch, illustrating this interesting epoch in the history of engineering. The building would also serve as a meeting place and library for scientific societies, and be a centre from which engineers can co-operate in spreading technical knowledge.

(3.) The publication of a memorial volume.

The meeting was attended by some 200 representatives of learned societies and engineering institutions. A most interesting speech was delivered by Sir Oliver Lodge, Principal of Birmingham University, on Watt's contribution to science. In the course of his speech Sir Oliver made the suggestion that the proposed chair would practically resolve itself into a chair of fuel research, and voiced the opinion that were James Watt alive today, in all probability his genius would be directed towards improving and perfecting internal combustion motors.

The Lord Mayor made the announcement that the Birmingham Small Arms Company, Ltd., had promised £1,000 towards the expenses of endowment of the Chair of Research, provided five other similar donations were received.

BALANCING THE SINGLE.

Device by Famous Engineer to obtain a Perfect Mathematical Balance.

IN a leader in the issue for April 3rd we referred to the question of balancing the single-cylinder engine; we are now able to give particulars of the device to which we referred and which probably foreshadows remarkable developments in single-cylinder engine design. The inventor of the device is Mr. H. R. Ricardo, the designer of several important war service engines, but who perhaps is better known to the general motoring public as the inventor of the Ricardo two-stroke engine and the slipper piston.

From the patent specification drawings reproduced it will be seen that, according to this invention, two masses are mounted so that they can reciprocate substantially radially with relation to the crankshaft, and are disposed in line with either side of the crankshaft and on that side opposite to the piston.

Two crank members are formed on the shaft, adjacent to the crank webs, and are introduced to reciprocate the two masses in opposite phase to the working piston. In the diagram, these crank members are formed as a pair of eccentrics, the throw of which is opposite to that of the main crank. To these eccentrics are connected a pair of weights, which are constrained by links so as to reciprocate substantially radially with relation to the crankshaft. The ratio of the throw of each eccentric to the distance between the centre and the centre of gravity of the weights to which it is connected is equal to the ratio of the throw of the main crank to the length of the connecting rod.

Further, the ratio between the weight of the masses that are reciprocating (i.e., the piston and connecting rod on the one side of the crankshaft and the counter-weights on the other side) must be inversely propor-

tional to the strokes through which these masses reciprocate. To control the reciprocating movement of the weights, two rocking arms are employed, which are pivotally connected at one end to the weight at the point near the centre of gravity of the weight. At their other end the rocking arms are pivoted to some fixed point at one side of the crank case.

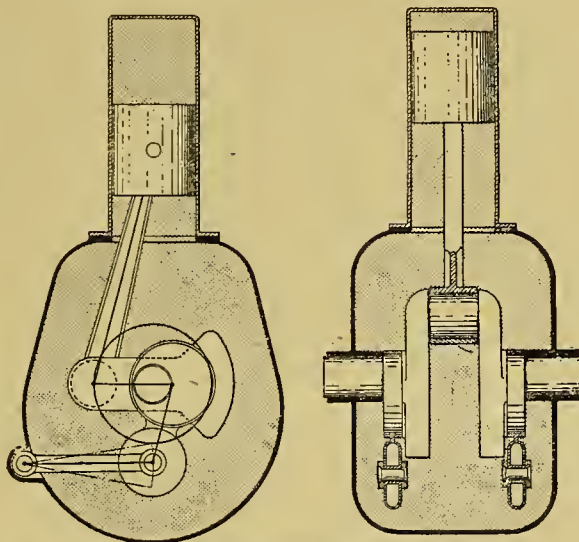
The illustrations depict in diagrammatic form a single-cylinder engine arranged with the balancing device. Incidentally, it may be mentioned that the

utility of this device is not confined to single-cylinder engines.

A careful study of the illustrations will show that by making the rocking link of sufficient length and the throw of the eccentric relatively short, the arc through which the weights are reciprocated can be approximated to a straight line. Other forms of linkage may be employed which will enable the weights to be reciprocated substantially radially with respect to the crankshaft axis.

Where the centre of gravity of the main reciprocating mass (the piston and connecting rod) is not coincident with the gudgeon pin, but lies at

some point in the connecting rod, so that this centre of gravity describes an ellipse instead of a straight line, the centre of gravity of each counter-weight may be compelled to follow a similar and opposing elliptical path. This can be effected by connecting the rocking link to the weight at a point slightly below the centre of gravity of the weight. In this way the common centre of gravity of the two groups of reciprocating masses can be maintained coincident with the centre of the crankshaft under all circumstances, and a perfect mathematical balance can be obtained.



Ricardo's patent balancing device for single-cylinder engines.

WHAT WE STILL WANT.

ENOUGH information is available to suggest that few, if any, of the 1919 models will embody all the practical gadgets for which the average rider clamours. To quote examples, when I take delivery of a new mount, the following operations are essential:

(1.) Fit a speedometer. (No "integral" provision for the drive: and the fitting of this accessory is always a particularly fiddley job.)

(2.) Obtain and pack spares. (These will vary with the type of machine: chain and belt spares, plug, and valve representing the usual requisites. They are never provided with the machine, nor is any provision made for packing them.)

(3.) Obtain and pack tyre repair outfit. (Seldom

supplied. Frequently the outfit is too big for the pannier. The vendors of the repair outfit should dimension it to fit a standard pannier.)

(4.) Obtain and fit a tail lamp. (Provided only on electrically-equipped machines.) A tail lamp should be designed as an integral part of the machine, and supplied with it.

I say nothing as to equipment with head lamp, hooter, etc., on which tastes vary. In such matters the practice first introduced by the Rudge people (I fancy) of including a variety of suitable patterns in their catalogue, just about fills the bill: it enables the man who wants his machine complete on delivery to suit his own fads.

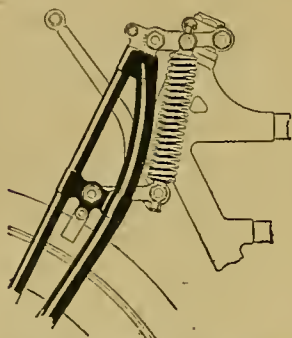
ROAD RIDER.

The New Douglas Suspension System.

Laminated Springs Abandoned in Favour of Helical Springs and Links.

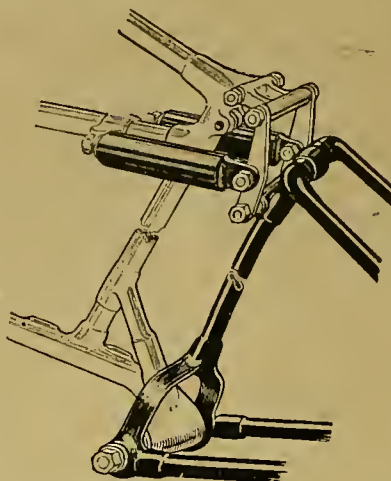
It is now known by almost every spring frame inventor and maker that the proposition presents more difficulties than is supposed by motor cyclists generally. Therefore the following description of the details and principle of the Douglas new frame will be found of more than ordinary interest considering that the principle is entirely different from the other spring frame introduced by this firm.

In our issue for May 1st we gave a detailed description of the new $3\frac{1}{2}$ h.p. Douglas model, but space did not permit us to deal fully with the spring frame and the redesigned front forks. After two years' road experience with the new type of springing the makers are abandoning the laminated springing system of their pre-war models, and have the greatest confidence in coil springs as being more suitable for motor cycle frame suspension.



Side view of the front wheel suspension. Note the lamp bracket.

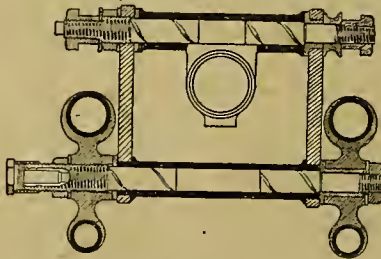
The back wheel is now carried in a triangulated frame, which is pivoted on the main frame at the rear of the gear box bracket. This pivoting point has a plain bearing 6in. wide. Hardened ground steel bushes provide the necessary bearing surfaces for the hardened distance pieces which surround a $\frac{1}{2}$ in. knock-out spindle. Hardened steel washers are pegged to the inside of the frame forks, movement occurring between the faces of these washers and the flanged ends of the bushes. Means of adjustment are not



General view of the springing system. The carrier tubes are omitted.

needed, as wear, if it occurs, will be very slight, and can be remedied by new washers.

At the apex of the triangle the rear frame is connected to the springs through a pair of levers which largely follow front fork practice. The upper ends of these levers are connected to a compensating link, which, in turn, is coupled to the main frame. The levers are attached to a pair of enclosed helical springs which lie horizontally one on each side of the frame with a forward attachment on the lower tank tube. Each spring is made up of

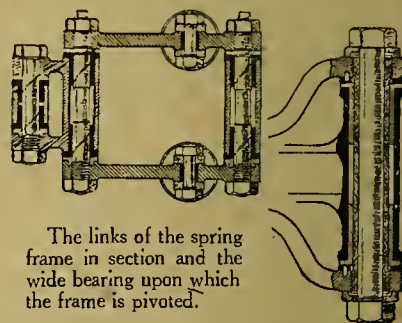


Section through the lower links of the front forks. Note the grease cups and means of adjustments.

two concentric springs of different periodicity. The action is obvious, but the amount of reduction through the links and levers is not so easily appreciated. A vertical movement of 3in. on the driving wheel is reduced to about $\frac{1}{4}$ in. on the springing. Lateral movement is practically non-existent.

The carrier is sprung with the frame, the lower lugs at the rear of the tank tubes accommodate a long supporting bolt, which carries both the saddle springs and the horizontal carrier tubes. The sloping carrier tubes are fixed to the main frame on the lug, on which the rear frame is pivoted.

The principle of the new front fork is the same as in former Douglas models. The chief point aimed at in redesigning has been to avoid lateral movement, greater resistance to wear at the links, and a good form of adjustment and lubrication. If side play develops it can be taken up by removing the grease caps, and slackening off the outside locknuts a few turns; a key is then inserted in the square holes in the spindle ends, and the spindles turned counter clockwise until the links move freely without side play.



The links of the spring frame in section and the wide bearing upon which the frame is pivoted.

The method of holding the springs is very good. Instead of the usual method of a nut and washer grip on the end coils of the spring, hardened steel lugs are spirally grooved to take two or three of the spring coils, and are screwed in at each end of the spring.

The steering crown is formed with a substantial lamp bracket projecting forward through the spring fork tubes.

READERS' ROAD REPORTS.

THE following are a selection of road reports furnished this week by readers of *The Motor Cycle*.

WARWICKSHIRE AND STAFFORDSHIRE.

Chester Road Station to threequarters of a mile beyond New Oscott.—Road very bad; pot-holed all over.

LEICESTERSHIRE.

Many of the Leicestershire roads are bad, one of the worst being from Leicester to Loughborough.

CUMBERLAND.

The road from Air Force to Matterdale is good, but from Matterdale to Troutbeck it is hardly safe, as it has been badly cut up by heavy timber waggons.

The road from Newby Bridge to Kendal over Cartmel Fell is good.

The road over the Kirkstone Pass is in excellent condition, though the surface is a trifle loose in places.

DENBIGHSHIRE AND MERIONETHSHIRE.

Chirk to Llangollen.—Road very bad; rutty condition for about two miles.

Corwen to Cerrigy-Druidion.—Still in a bad condition (has been so for quite a long time). It has been made up, but badly.

Corwen to Bala (main road).—Very bad, with loose stones. Valley road good.

Bala to Frongoch over the Arenigs to Festiniog.—Road almost impassable; the ruts are ten inches deep in places.

Portmadoc through Penrhyndendraeth, Harlech, to Barmouth, up to Penmaenpool.—In fair condition.

CARNARVONSHIRE.

Lake Gwinant, nearly into Beddgelert.—Road very badly cut up from timber drawing.

Road from Portmadoc through Criccieth, Pwllheli, Llanbedrog, to Abersock.—Very good.

Road from Pwllheli to Nevin.—Good. Nevin through Four Crosses to Criccieth.—In very good condition.

MONTGOMERYSHIRE.

Road from Dolgelly to Dinas Mawddwy, Welshpool, and Shrewsbury.—In very good condition.

MONMOUTHSHIRE.

The road from Cardiff via Newport and Chepstow up the Wye Valley to Tintern is in excellent condition except for about one mile on the Cardiff side of Newport.

LETTERS TO THE EDITOR

The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address

A SPORTING MACHINE.

Sir,—It will probably interest your readers to know that the Zenith I rode in the Birmingham trial, and which did a non-stop run, was a standard 1915 model with a low gear of only 7 to 1. This, I should think, was the highest gear in the trial, and, in my opinion, is far more sport to drive round a tricky course than a very low geared machine, as the engine speed must be kept up on a stiff gradient. Congratulations on your plan of description of this event.

I should like to recommend all readers who are keen on motor cycling as a sport to enter in open trials. It gives one an enjoyable and sporting day's outing, and you get plenty of fun even if you do not pull off an award.

R. CHARLESWORTH, Lt., A.D.S.

SCOTTISH FERRIES.

Sir,—The Granton to Burntisland Ferry has been disused for a few years. It was advertised to start on May 1st. I wanted to cross only recently, but could not. All the satisfaction I could get was the statement that it would start in June. There are no regulations regarding petrol.

To cross the Forth it is necessary to go to Queensferry. Petrol may be carried. Solo mount, 6d.; yourself, 6d. The road from Inverkeithing is very bad as far as Kirkcaldy.

JAMES KILCOYNE.

Sir,—In reply to letter from "W 5124," I may state that I have crossed the River Forth on all the ferries both with motor car and motor cycle, and have always found absolutely no difficulty whatever.

There are no restrictions as to the carrying of petrol, and the charges are very moderate.

With regard to touring in the Highlands, I have not known of this ever having been stopped. It is necessary, however, for the tourist to apply for a passport to travel north of Inverness, this being a special military area. The chief constable at Inverness issues these passes.

Ferries north of Inverness are very rough and ready affairs, and there is considerable difficulty in loading and unloading.

A. SCOTT FREEMAN.

DUAL PURPOSE MOTOR CYCLES.

Sir,—Because a writer favours one special make of machine I hardly think he is justified in insinuating, even in the form of a question, that all other makes fail to be ideal for solo or sidecar work.

As an amateur rider, with practically no technical knowledge like Mr. G. Taylor, I can only speak from results as I see them; and I say that there are many machines which serve the dual purpose exceedingly well. We all look for improvements and new ideas, and so welcome and give our best wishes to the A.B.C., but why despise our old tried and true friends, which have carried us thousands of miles alone, and when asked to carry a double load have never failed us? I am patiently (or otherwise) waiting for a 3½ h.p. Sunbeam which, with its oil bath, gear case, and lively engine, will, I know, take me either solo or with a sidecar over the worst hills and roads of North Devon with perfect ease, and there are many other makes which can do the same.

N. H. KETTLEWELL.

Sir,—I am rather disappointed in one respect with that excellent production of Mr. Granville Bradshaw, viz., the 400 c.c. post-war model of the A.B.C. motor cycle, rated at 3 h.p. and weighing 150 lb. I have been longing for these happy days of peace to come, so that I could order one of the A.B.C. models, secretly hoping that the 500 c.c. model rated at 3½ h.p. would be increased to 550 or 600 c.c., thereby giving us a 4-5 h.p. machine for "double purpose," instead of which I find the capacity reduced to 400 and the weight to 150 lb.

I want the machine chiefly for pillion riding with a combined weight of say 22 st., including luggage, and possibly for a sidecar when I can find accommodation for it.

Now I am afraid that this model will not be strong enough for serious touring under the conditions I have stated, and that the load would necessitate running the engine "all out" for a considerable period of a day's run. This is bound to result in rapid wear and deterioration. I do not mind the first cost, but I cannot afford to buy a machine every few years. The one I have must wear and last for years, provided time and money are spent on its upkeep, and it is not overworked.

Cannot the A.B.C. Motors, Ltd., be persuaded to give us something between their 1,100 c.c. cycle car and the 400 c.c. solo mount?

I am sure there must be hundreds like myself who want a double-purpose mount that will give that long service that I have stated to be essential.

I trust, therefore, that some steps will be taken to satisfy that demand or many of us will, very reluctantly, feel ourselves compelled to buy inferior mounts, but of higher h.p. Portsmouth.

A.H.P.



Start of the first heat in the solo class at the York and District Motor Club's hill climb at Garrowby Hill. Results will be found on page 495.

SADDLE TANKS.

Sir,—I am glad to see the increasing popularity of the saddle tank, and to note that Messrs. Alldays and Onions have adopted it as their standard pattern.

It is, of course, open to anyone who devises a new or original shape of saddle tank to register the design of that shape, and Messrs. Alldays and Onions appear to have registered such a design a few months ago. The saddle tank itself dates from pre-war days. You described mine in your issue of June 18th, 1914, in connection with the triangulated top frame.

This form of frame construction is the real *raison d'être* for the saddle tank, the latter being the natural concomitant of the former.

DOUGLAS LEECHMAN.

THE GYROSCOPIC ACTION OF FLYWHEELS.

Sir,—“Ixion’s” remark *re* the gyroscopic action of transverse flywheels in motor cycles seems to assume that this action should tend to make a turn more difficult. On the contrary, however, it has no effect with this type of flywheel, and it is the ordinary flywheel rotating in the plane of the motor cycle that makes cornering more difficult. This can be shown by a simple process of reasoning from the elementary laws of mechanics relating to rotary motion.

The trouble occurs in the “banking over,” which always takes place in cornering. In the case of the usual type of flywheel there is a resistance to this “banking,” and the machine must therefore bank over at a bigger angle than would otherwise be necessary. In the case of the transverse flywheel, there is no resistance whatever, the effect in this case being an increased pressure on the front or back wheel according to the direction of the turn.

Obviously, then, the A.B.C. motor cycle, for example, should be, as far as the flywheel effect is concerned, a better cornering machine than, say, the conventional single-cylinder.

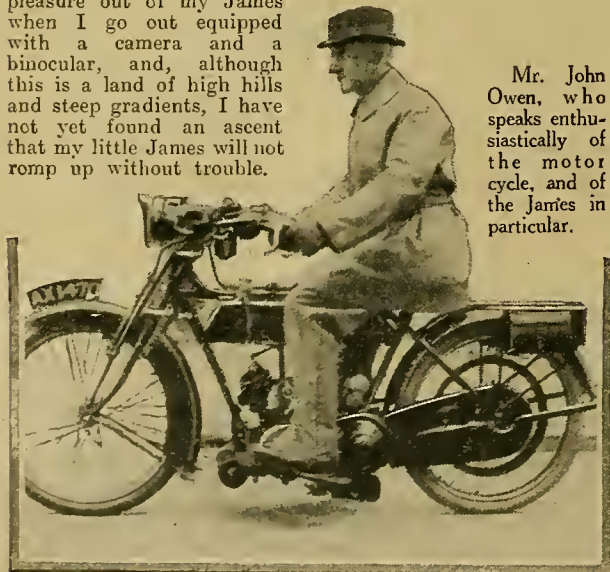
F. OGLE.

[“Ixion’s” paragraph was written to correct the suggestion made by a correspondent that cornering would be difficult on an A.B.C.—Ed.]

AN ENTHUSIAST.

Sir,—Having been a reader of *The Motor Cycle* for three or more years, and observing that you occasionally give space to paragraphs written by obscure lovers of the sport, with snapshots, I venture to send herewith a small photograph in which my $3\frac{1}{2}$ h.p. James twin machine appears.

You may be interested to know that I have taken up motor cycling after attaining my 51st birthday, and I get a tremendous amount of pleasure out of my James when I go out equipped with a camera and a binocular, and, although this is a land of high hills and steep gradients, I have not yet found an ascent that my little James will not romp up without trouble.



Mr. John Owen, who speaks enthusiastically of the motor cycle, and of the James in particular.

I would like to add my congratulations to the many you receive on the excellence of your paper, both as regards the matter as well as the attractive “get up.” I look forward eagerly to each issue, and read the whole from cover to cover.

JOHN OWEN.

Abergavenny.

THE A.B.C. COMBINATION.

Sir,—In view of the fact that future proud owners of the A.B.C. who desire to run a sidecar will often ride solo when the best girl is not available, it would be interesting to know if machines ordered as combinations will have special lugs brazed to the frame, or if all machines will be the same. It will be a great boon—especially for those who cannot get a combination indoors as a whole—if the sidecar is easily fixed with little possibility of getting an incorrect position.

Perhaps Mr. Granville Bradshaw will oblige with details, as none have yet been published.

F.A.

Bournemouth.

OVERALLS.

Sir,—*Re* “Ixion’s” remarks *anent* overalls; why should overalls always be made so that they cannot be put on without smudging the mud of a dirty boot all over one’s nether garments? The instep straps also are fastened in the wrong way. The enclosed sketch shows how to avoid both these troubles, and overalls so made are fully as efficient in every way as the usual kind—I have worn them for years, having had them made to order, and can speak from experience.

MUD-PLUGGER.

York.



A useful design of overalls.

AVERAGE SPEEDS.

Sir,—A letter published in your issue of April 24th from “R.D.B.” *re* average speeds has “given me furiously to think.”

As one who has travelled the road in question many dozens of times for the last seventeen years, I may claim to know it well.

To put up an average of 34 m.p.h. your correspondent must have travelled for miles on end at speeds of 50 m.p.h. and over. There are portions of this road where speed is impossible, as at Iford, Christchurch, Totton (two dangerous corners), Winchester, Itchen Abbas (two corners dangerous), and Farnborough with its military traffic. What arrangement did “R.D.B.” make with the railway companies to have all the level crossings open as he flew by?

All things considered, I am afraid that “R.D.B.” must be exaggerating somewhat. No wonder motor cycling “stinks” in the minds of too many of the non-motoring public.

SHAZBAZZIK.

Sir,—With regard to the letter of “R.N.” concerning average speeds, I might mention that on Tuesday last I rode from Dunstable to Rugby, a distance of forty-nine miles, in 1h. 15m., which works out at 39.2 m.p.h.

The machine was a 1919 I.O.M. Rudge Multi, and was driven well within its limits.

The same journey was done on another occasion with a passenger on the carrier at an average speed of 33.4 m.p.h.

No overheating or loss of power occurred on either run. Usual disclaimer.

A. BRESLAU.

Sir,—Is not this question a relative one, like most motoring questions, and needing various factors to be taken into account? Doubtless “R.N.’s” friend exaggerated in saying he did 140 miles in three hours, but there is a reasonable medium between that and “R.N.’s” dictum that 20 m.p.h. only can be fairly reckoned on. It is all a matter of whether one wants to or not, plus horse-power and engine in good trim.

I have just completed a run of 340 miles, there and back—Lincolnshire to Wiltshire. My outfit is a $4\frac{1}{2}$ h.p. B.S.A. combination. I left at 8.30 a.m. and arrived at 4 p.m., stopping once only to fill my tank. I carried my own petrol for the whole trip in addition to passenger and bag, and ate as I rode. The petrol was No. 3 grade. The speed never dropped below 25 m.p.h., was mostly 30 m.p.h., and often 35 m.p.h. so long as I had a clear road. I passed through four big towns and encountered some dangerous corners, which necessitated a slower speed, but the machine had no rest, since the gears were constantly in use. I repeated the performance returning.

If the engine is of $4\frac{1}{2}$ h.p. or more and in good trim, I see no reason why any rider accustomed to more than riding



A trial recently held by the Motor Cycle Club of Rome, which included a 1 in 16 hill, with very bad surface, was won by Trivellato, who is seen above mounted on a Harley-Davidson. His average speed was 45 m.p.h.

about town should not do the same, with no untoward strain on himself or engine.

In doing a trip of well over a hundred miles there is usually some other factor besides mere pleasure present, e.g., urgency, saving train fares (I saved over £5), etc. Consequently, one gets over the ground as quickly as possible, so that, should a breakdown occur, one has as much time as possible to rectify the trouble.

F.J.A.

Spilshy.

A TABLOID HISTORY OF AIR-COOLING.

Sir,—I was both amused and interested to read "Torque's" letter on this subject in *The Motor Cycle* for May 1st. I am not in the habit of rushing into print without obtaining authority for my facts. I have figures on petrol consumptions of aero engines at heights which "Torque" has never seen, so I am certain of my facts.

I presume that "Torque" is all the time referring to consumptions in the air and not on the bench, for he says that a rotary consumes about one-tenth of a pint more per b.h.p.-hour than a stationary of corresponding power. Pints per b.h.p.-hour is the bench method of giving consumptions; consumptions in the air are always gallons per hour.

I entirely disagree with the examples given by "Torque." They are hopelessly wrong. I will prove this, and show that the rotary is the more economical. The two following tables, which give consumptions in gallons per hour, are self-explanatory. I have chosen these particular engines because they are practically all the same horse-power as the two large rotaries given in table No. II. They are all taken at the same height (15,000 feet) and at full out speeds:

TABLE I. (STATIONARIES).

230 h.p. S.P.A. ...	11½	galls. per hour.
230 h.p. Puma ...	11¾	" "
200 h.p. Raf. 3a ...	13½	" "
220 h.p. Benz ...	13	" "

TABLE II. (ROTARIES).

230 h.p. B.R.2 ...	11	galls. per hour.
220 h.p. Clerget ...	10¾	" "

I regret that in my previous letter I was not a little more careful about horse-power. I should have explained what power of rotaries and stationaries I was thinking of. However, the above tables will do this. I still maintain that radials are "unproved." I am quite aware what the R.A.F. 1919 programme was (I probably knew it before "Torque" did), but laying down a programme does not prove an engine. This can only be done by plenty of hard work in Service

machines, and this has never been done with radials, so how can "Torque" imagine they have been proved?

I hope this letter will answer the various points raised by "Revs." in his letter of the same issue.

PITOT.

EASY STARTING.

Sir,—As a constant reader of your excellent paper, I see frequent articles and allusions to the difficulty of starting up under the present-day conditions of petrol, etc., and should like to give you my experiences. In the first place, may I say that I am badly crippled in the right leg.

I am riding a 1916 A.J.S. combination, which I find suits me admirably, and which gives me the minimum of trouble in every way, but particularly in this matter of easy starting.

Whether it be high summer or the depth of winter my machine will always start with, at the most, three kicks, by the simple operation of flooding the carburetter, and I have never yet had to prime the cylinders, though I have used all grades of petrol and benzole.

During a recent frost, despite the fact that my machine had been standing idle for some days in an unheated garage, I was agreeably surprised to find that the engine started away merrily at the second attempt, while on one occasion after standing uncovered in the snow for about six hours it started at the first kick.

I leave other A.J.S. riders to account for my apparent good fortune in this respect; but my system throughout has been to ensure a minute adjustment of my valves, to keep my plugs clean, and to pay constant attention to what is, I suppose, the fitment which gets the least attention on a motor cycle—the high-tension wire.

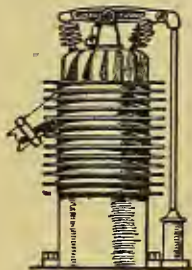
Finally, attention to lubrication and the use of good oil will save "gumming" and much bad language from those who find that it takes more time and energy than they can spare to start their machines and get on the road.

Wimbledon.

K.O.S.B.

VALVE OPERATION.

Sir,—As you are doubtless aware, certain aero engines, for example the Curtiss, have both overhead valves operated by one rod and one cam. I should be interested to know if any readers of your excellent paper have suggestions as to why this method should not be incorporated in the manufacture of motor cycles.



Overhead inlet and exhaust valves operated by one rod and cam.

I cannot recollect any such design of British or foreign manufacture, and should by chance motor cycle engines of this type be in use, and have not come to my notice, they are certainly few.

Personally, I think that such a design would result in the removal of valve clatter and tend towards simplicity in valve design, though, of course, it would not permit of overlap.

R. G. R. PRITCHARD.

MAPS FOR MOTOR CYCLISTS

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SAFE TRAVEL BY AIR.

Landing under Difficulties. Anchored "Buoy" Balloons. Parachutes as Life Preservers.

By TORQUE.

EXPERIENCED pilots whose air impressions are based on scout machines, and tainted by the special dangers of fighting and stunting, are apt to be pessimistic about commercial flight. They often say that regular aerial services, irrespective of weather conditions, are impracticable on any real basis of safety; and they regard the glib optimism of the daily press as sheer "hot air."

In sober fact, while there is much *premature* optimism abroad, present hopes merely need post-dating to, say, 1925, rather than contradiction. Take parachutes as an instance. We have scarcely used them except from balloons, but they are being developed at a great pace. Large aeroplane liners will soon be equipped with a parachute for each passenger. Before long a test demonstration will be organised. Twenty passengers will be taken up to 1,000 feet, don their parachutes, and quit the saloon through a door in the side. The mere sight of the tackle will naturally "put the wind up" the occupants at first: but before long they will rouse no more qualms than the sight of the lifebelts on a steamer. Modern patterns open with infallibility, and can safely be used from heights of 500 feet or less.

Improved instruments will facilitate navigation extraordinarily. In 1914 altimeters were useless as aids to night landing. The instruments then in use suffered from "lag," recording the machine's height after an interval during which it might have gained or lost many feet. The modern types register instantaneously and with great accuracy. With the aid of a few more gadgets, it will become possible for a third-rate pilot to make a perfectly safe night landing on an unlit aerodrome in a thick fog. I cannot give full details, but here is an outline of a crude scheme. The aerodrome is located by balloons carrying lamp signals and floating above fog level. The pilot glides down into the rectangle thus indicated. At a height of 200 feet, as registered on his altimeter, he lowers a trailing ground indicator, which need not be more complex than a weight slung on a cord, though this is not the actual method in view. When the weight touches the turf, the change in the pull on the cord is signalled to the pilot by suitable mechanism to which the cockpit end of the cord is attached. He now knows his height above the ground to a foot, and can land safely without wingtip flares or ground lights, or if such illuminations are blanketed by an impenetrable fog. To go a step further, such an

apparatus could be constructed to operate the controls at the correct moment and to the correct degree.

The Remaining Risks.

Route-finding will soon be organised by means of lighthouses, anchored balloons, and other ground signals. Before very long overwater routes will be similarly marked out, and the three chief surviving dangers of aerial travel will be limited to:

1. Forced "landings" on large expanses of water.
2. Fires in the air.
3. Collapse of the aeroplane in flight.

None of these is as formidable as it may often appear, both to the war pilot and to the man in the street. Such machines as the "Felixstowe Fury" will be used for trans-ocean flights. It has five engines, and can take off or hold the air with two engines out of action. Moreover, on her keel she can ride out quite choppy seas. So before a "ditching"

could have catastrophic results she would have to come down in really rough weather far from assistance and with three engines more or less permanently dud.

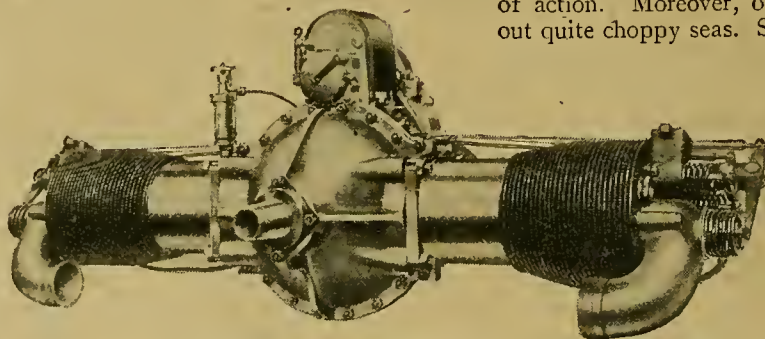
Fires in the air must remain a possibility as long as petrol is used for aircraft fuel. On the other hand, except under war conditions, a fire in the air is not

commoner than a fire at sea; it would usually be detected in its infancy, and extinguished immediately by chemicals. This peril is absolutely as negligible as in any other form of transit, apart from the special risk attending a crash landing; and crash landings, as suggested above, will be reduced or eliminated by other methods.

Structural collapses have not been uncommon in the war, but have generally resulted from enemy action—e.g., machine gun or Archie fire, or from exceptional strains in stunt flying. The design of machines has been safeguarded with great efficiency by the Air Ministry, and the quality of materials and workmanship has been verified by the A.I.D. Proposals now before Parliament are evidently framed to continue these precautions. With the removal of special war strains and dangers structural collapses should become extremely rare.

GRANTS FOR ROAD REPAIR.

In reply to a question by Mr. Joynson-Hicks in the House of Commons, the Secretary to the Treasury stated that the Road Board are dealing promptly with all applications for grants from highway authorities in whose districts unemployment exists.



In view of the frequent discussions on the air-cooling of fairly large-sized cylinders, it may interest those readers not conversant with aero engines to know that the Gnat, a flat twin aero engine following motor cycle practice (although 30 h.p.), was quite a success during the war, although used without any special system of cowlings.

QUESTIONS AND REPLIES

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C.4, and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

Roc Two-speed Gear.

? Would you please be so kind as to give me the name of the makers of the Roc two-speed gear, as I had a small break-down recently and broke the clutch?—W.T.

The address you require is Messrs. A. W. Wall, Ltd., Hay Mills, Birmingham.

Which is the Faster?

? Would you kindly tell me which has made the greatest speed, a motor cycle or a motor car?—H.A.C.

Up to the present, a motor car holds the record for speed. The fastest motor car, officially timed, was Hemery's Benz, which accomplished 127.877 m.p.h. on November 8th, 1909, at Brooklands. The fastest motor cycle, officially timed, was Sidney George's Indian, which accomplished 93.48 m.p.h. on May 5th, 1914, at Brooklands.

28in. x 2in. Tyres.

? I have a very old Quadrant motor cycle, and I require a new outer cover for one wheel. The one I have on it now is 28in. x 2in. Can you tell me if I can put a 28in. x 2½in. on it, as I am unable to obtain a 28in. x 2in.? If not, can you tell me where I can get a 28in. x 2in. outer cover?—R.M.

A 28in. x 2in. rim will not take a 28in. x 2½in. tyre. If you cannot obtain a 28in. x 2in. cover locally, write to Messrs. The Dunlop Rubber Co., Ltd., Aston Cross, Birmingham, as to whether they have any 28in. x 2in. covers in stock.

Worn Dog Clutches.

? I have a 2½ h.p. Douglas. When riding on top gear the gear suddenly fails to hold and the engine races round as if in neutral. After a few moments it picks up again only to do the same thing a short time later. I have made all adjustments I can think of without effect. I should be very much obliged if you could help me.—C.H.D.

The trouble is due to worn dog clutches in the gear box or to the gear control lever being wrongly adjusted. See that the gear is perfectly free in the neutral position, and then ascertain whether the top gear is fully engaged. If this happens there should be no reason why the gear should not keep in engagement, but if, on the other hand, you find that after this adjustment the trouble still ensues, you should take down the gear box and see if the dogs are badly worn. If they are, renewals are necessary.

Sparking at the Contact Breaker.

? Would a magneto be faulty if (1) it sparked slightly at the platinum points? (2.) The make and break on my magneto is faulty. The points are opened the proper distance, but they close about two-thirds on the cam. Would this cause it to spark at the platinum points? I get a good spark at the plug. (3.) Is a sparking plug faulty when it loses compression through the body, except as regards loss of power through losing a little compression? (4.) Can anyone tell if a magneto is faulty by the colour of the spark? (5.) Is it possible for a magneto to fire petrol when poured in through the compression tap and not fire what is drawn from carburetter? (6.) What are the symptoms of a magneto getting out of order, besides the spark becoming feeble? (7.) What is the cause of firing in the silencer about once in a hundred or two when travelling "all out"?—P.W.

(1.) No, this is only natural. (2.) There must always be a slight sparking at the platinum point, but the degree of sparking is regulated by the condition of the condenser. (3.) Certainly the sparking plug is faulty if it allows the compression to leak past the body of the plug. (4.) You only need be concerned with the magneto being faulty if it ceases to spark. The colour of the spark is nearly always the same. (5.) Certainly this is possible if there is any defect in the carburetter. (6.) There are no others. (7.) Probably through misfiring, which causes unexploded charges to enter the silencer and get fired by the next charge which is exploded.

SPECIAL NOTICE.

TO EVERY READER.

TO ensure regular supply of "The Motor Cycle," readers are requested to place definite orders with their newsagents or at a railway bookstall for copies to be reserved or delivered each week. To depend upon chance purchase is to risk disappointment.

Castor Oil.

? Having a quantity of castor oil at my disposal, would you tell me if it would be suitable for the lubrication of my 3½ h.p. sidecar combination? I have been told it is used in air-cooled aero engines.—H.C.

Castor oil is not suitable for motor cycle engines, as it is liable to have a corrosive action upon the cylinder. Aero engines are run under different conditions, and are frequently cleaned, whereas motor cycle engines are required to run anything from 1,500 to 2,000 miles without having attention paid to them. We presume you do not refer to Castrol, which is quite suitable for motor cycle engines.

High Petrol Consumption.

? (1.) I have recently purchased a 2½ h.p. Alldays two-stroke motor cycle fitted with a Senspray carburetter. It is a good machine in every respect, but I find I can only get 48 to 50 m.p.g. This seems to me a very low mileage. I should be glad if you could advise me how to improve matters? It has the petrol method of oiling, and a No. 26 jet is fitted. (2.) What is the correct amount of oil to a gallon of petrol? There is a ½ pint measure fitted to the underside of the tank.—A.E.M.

(1.) We would recommend you to try a smaller jet, as the petrol consumption named is certainly too high if the machine is used at normal speeds. If, however, you are maintaining comparatively high averages, this may account for the consumption mentioned. (2.) The correct proportion is half a pint of oil to one gallon of petrol.

Carburetter Freezing.

? My 2½ twin is fitted with an Amac carburetter. The wire gauze fitted over the air intake becomes covered with a white film, like thin tissue paper. This cuts off the supply of air and stops the engine until the film is removed, when it goes all right again until the film reforms. I have varied the size of the jet, but with no success. Can you suggest cause and remedy and tell me if the fact of running on benzole is in any way responsible?—REX.

The thin film referred to is probably hoar frost or snow, caused by the rapid vaporisation of the fuel which causes intense cold. The only remedy is to remove the gauze and fit a warm air intake. Petrol would cause the same trouble as benzole. Try the effect of running without the gauze first of all.

Four-stroking.

[?] I have a 1914 2½ h.p. two-stroke Connaught and find it satisfactory except that, when running on the level or downhill, misfiring takes place, and it four-strokes frequently, but when going uphill it fires beautifully and pulls well. I shall be greatly obliged if you will give me an idea of the cause of the trouble.—K.L.S.

This is a common fault among two-strokes when running "light." Perhaps the fitting of a smaller jet might improve matters.

Miles per Gallon.

[?] I have a 4 h.p. W.D. Douglas sidecar combination, and shall be glad if you can tell me: (1.) What mileage should I get per gallon? (2.) How should the driving chain to the gear box be tightened? (3.) How is it that my aero plugs soot up every ten to fifteen miles, especially the rear cylinder one?—W.P.

(1.) About sixty miles per gallon. (2.) By loosening the nuts holding the gear box to the bracket and sliding it back. (3.) This is because you probably give rather too much lubricating oil.

Copper Tubing and Acetylene Gas.

[?] Will you please let me know if it is dangerous to use copper tube for connecting up acetylene lamps?—F.J.W.

There is certainly some danger in using copper tubing in connection with acetylene lamps, though nearly everybody does so. There is no doubt that steel tubing is safer. Under certain conditions—that is to say, if the temperature is warm and damp—a substance is formed of the nature of fulminate of mercury, known as copper acetylide, which is liable to explosion if the tube be subjected to a blow or to friction.

Timing a Two-stroke.

[?] My machine is a 1915 Levis two-stroke. I have taken it down for decarbonisation, but on putting it together it will not run. I have thoroughly overhauled every part—engine, carburetter, and magneto—but can find no defect. Timed contact points just breaking with piston on top and spark fully retarded. Is this correct? Carburetter quite clean, also jet; no air leak anywhere. Petrol gets into cylinder all right. Compression excellent—sufficient to lock back wheel. All ports—inlet, exhaust, and transfer—quite clear. I have tried several plugs, and every one has given a good hot spark when the plug has been out on the cylinder top. I have injected petrol into the cylinder, but get no explosion from that; therefore I conclude it must short-circuit under compression, although the carbon brush is quite clean on the slip-ring, also the platinum points.—B.C.O.

If the carburetter is really fixed properly without any air leaks at the joints, and the timing is correct, the engine should, of course, fire. The timing of a two-stroke requires a much more exact

setting than does that of a four-stroke. You might try the spark rather more retarded. If you half advanced the lever and retimed as before, you would probably get better results. We presume you have not replaced the piston back to front?

Cork Floats and Benzole.

[?] (1.) Would benzole injure the cork float of the fuel level indicator in my tank, also the enamel on the tank and the machine? (2.)

I recently had the springs of my Triumph forks plated and they now seem much livelier than before, bottoming very often on what I do not consider a very bad road. Could the plating have weakened the springs? (3.) Would Terry's spring links be a good remedy? (4.) Could you suggest a better alternative, or how they might be fitted? (5.) What gauge tubing is usually used for making the chassis of sidecars?—E.S.

(1.) Yes, unless the float is treated with a varnish made of 90% alcohol and shellac. Pure benzole does not much affect the enamel of the tank, but, as a precaution, it is advisable to wipe off any trace of benzole which has been spilt on the tank with an oily rag. (2.) The fact of plating the springs could not well have weakened them. (3.) Terry spring links could not be fitted to a Triumph fork. As you mention springs, we assume that the fork is of an old pattern or one not of the Triumph design; the modern Triumph fork has but one spring. (4.) A better alternative would, we think, be to return the springs to the Triumph Co. and ask them to exchange them for a stronger pair. (5.) The gauge varies from eight to twelve.

Fitting a Sidecar.

[?] Would you please give me advice on the following: (1.) I have a 1914 3½ h.p. Sunbeam and Gloria A1 1914 sidecar. Would you let me know what you consider the best means of connecting the bicycle to the car? When new, the back connection was by means of a bent tube from the saddle pin to the sidecar chassis just near the sidecar wheel. By having this kind of connection, it was impossible to keep the sidecar wheel in a vertical plane, and to get over this difficulty a straight tube was fitted from the saddle pin to a point about directly beneath the centre of the body of the sidecar; this connection broke the sidecar tube within the first fifty miles. Now I have the chassis repaired. I thought I would seek your advice before attaching it to the machine. (2.) I intend fitting four coil springs between the body and cross pieces of the sidecar, and should be glad if you could tell me what size springs to use (weight of passenger 11½ stone), as the sidecar wheel is not sprung. I thought these coil springs would take off some of the worst road shocks. Do you think ½ in. round stock, 2½ in. long, 1½ in. diameter, would be sufficiently strong for the purpose?—E.D.

(1.) You require a substantial connection on to the horizontal rear wheel fork, one to the saddle-pillar, and one to the

steering head. The point to aim at is to get a connection from near the sidecar wheel axle to the saddle-pillar in a straight line. (2.) You require four 75 lb. springs, about 3½ in. long, to give approximately ½ in. deflection.

Impure Benzole.

[?] I have a 2½ h.p. 1913 Douglas fitted with an A.M.A.C. carburetter, with which I am having some trouble. I should be much obliged if you would give me a few hints. I am running on benzole, there has been no alteration to the carburetter, and I have a jet which is about three sizes bigger than is generally used. When I start up, the machine will sometimes run all right on the throttle, but will not take any air; at other times it will only run about fifty yards and then start blowing back through the carburetter, and stop as soon as I try to open the air lever. I have had the carburetter all to pieces and cannot find anything wrong with it. The induction pipe joints are bound with tape, so there are no air leaks. I have new cylinders, so it cannot be the valve guides, and the valves are not sticking. I get a good spark and the timing is correct. I notice the slides in the carburetter are worn slightly, but have never had any trouble with petrol.—J.H.

You can usually afford to use a much smaller jet when you are running on benzole. Very likely the benzole you are using is impure, and the presence of water in it might account for the blowing back from which you are suffering. Find out the source from which the benzole was obtained, and, if you have reason to suspect its quality, write to the National Benzole Association, Horseferry Road, London, S.W.1.

RECOMMENDED ROUTES.**LEICESTER TO DROITWICH.—F.H.S.**

Leicester, Rugby, Southam, Learnington, Warwick, Stratford-on-Avon, Alcester, Bradley Green, Droitwich. Approximately 76 miles.

ALCESTER TO LIVERPOOL.—J.T.E.S.

Alcester, Droitwich, Kidderminster, Bridgnorth, Wellington, Hodnet, Whitchurch, Chester, Birkenhead, ferry to Liverpool. Approximate distance, 112 miles.

WOLVERHAMPTON TO HERTFORD, AVOIDING LARGE TOWNS.—H.G.C.

Wolverhampton, Willenhall, Walsall, Aldridge, Bassetts Pole, Watling Street, then direct to Fazeley, Atherstone, High Cross, Kilsby, Daventry, Weedon, Towcester, Stony Stratford, Penny Stratford, Dunstable, St. Albans, Hatfield, Hertford.

PRESTON TO LOWESTOFT.—H.P.

Preston, Clitheroe, Skipton, Ilkley, Otley, Harewood, two miles south of the latter place turn right and go through Doncaster, Retford, Newark, Sleaford, Swineshead, Holbeach, Long Sutton, King's Lynn, Swaffham, Watton, Caston, Attleborough, New Buckenham, Pulham, Harleston, Bungay, Beccles, Lowestoft. Approximately 260 miles.



WE KNOW

THAT by merely promising deliveries of new machines we could keep a clerk all day and every day booking orders.

THAT we could take any number of deposits and see our Bank Balance (like the fat boy in *Pickwick Papers*) "swell visibly."

THAT by buying second-hand machines indiscriminately at fancy prices we could, without any trouble, re-sell at still higher prices.

THAT we could easily obtain premiums for preferential deliveries of new machines.

THAT in fact at the present time:—

*There is unlimited capital (by way of deposits) for the asking.
Unlimited opportunities for making big profits.*

BUT as we have no intention of sacrificing our reputation—acquired by ten years' honourable trading—for one year's orgy of Boom Profits:—

We make no definite promises as regards delivery of new machines.

We persist in our rule only to sell second-hand machines as and when they pass through our workshops—where they are completely dismantled and thoroughly overhauled.

We continue our policy to supply new machines in strict rotation at catalogue prices.

AND——we are sanguine enough to think that in 1929 GODFREY'S LTD. will still flourish and be more firmly established than ever in the confidence of the motor cycling public.

WE can foresee a lot of trouble in the near future and a plethora of disillusioned and dissatisfied customers. We do not want a single one to associate GODFREY'S with his disappointment.

WE want GODFREY'S promise to be something which the whole motoring world will accept without question simply because it is GODFREY'S.

WE don't want to refuse orders. We are anxious enough to make our already large business larger still, but we want no business which is not satisfactory to the customer, and think it only fair to state we can only accept orders at present for strictly rotational delivery.

GODFREY'S LTD., 208, Gt. Portland St.,
LONDON, W.1.

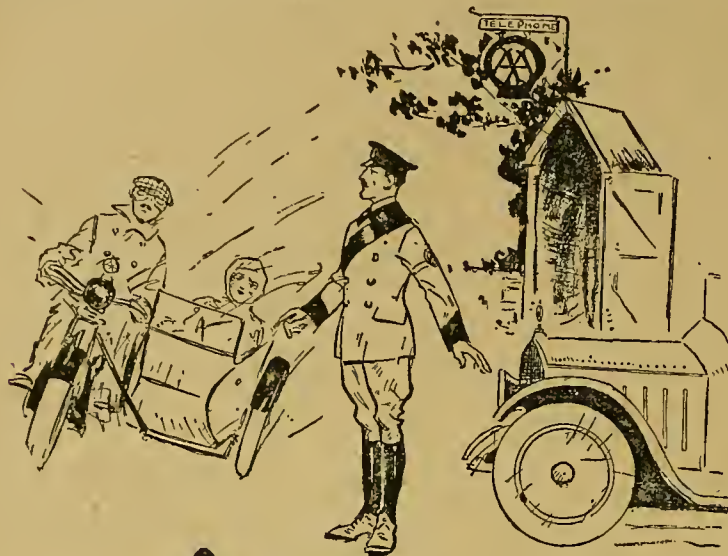
Phone: 7091 Mayfair (2 lines).

We are open to purchase for cash modern second-hand motor cycles and combinations.
Send full particulars and our representative will call at your convenience.



THE A.A. AND THE MOTOR CYCLIST.

The wise motor cyclist is a member of the A.A. because he knows that not only does it offer him advantages not approached by any other organisation, but its activities precede him into every corner of the Kingdom and overflow on to the Continent.



Its General Headquarters are at Fannin House, Whitcomb Street, London, W. C. 2, where all its administrative departments are quartered. Here the Executive Committee under the Chairmanship of Mr. W. Joynson-Hicks, M.P., review and direct the work of the Association, and the chief officials under the Secretary, Major Stenson Cooke, meet weekly to discuss policies and programmes. The personal services of the staff are

at the service of every member and each inquirer receives prompt and painstaking attention.

In the Reception Room his particular business is stated, and if it can be settled then and there, that is done. If not, he is put in touch with the department handling it without delay or circumlocution.

Headquarters is the Clearing House for the considerable metropolitan membership, and linked up to it, modelled on its lines, and conducted with the same efficiency, are seven District Headquarters covering the entire Kingdom with offices at

Belfast.	Cork.	Manchester.
Birmingham.	Dublin.	Norwich.
Brighton.	Edinburgh.	Oxford.
Bristol.	Exeter.	Plymouth.
Cambridge.	Glasgow.	Swansea.
Cardiff.	Leeds.	and Paris and
Carlisle.	Liverpool.	Nice.

At each of these a member can obtain all the information and assistance available at General Headquarters.

The new member, or the old one re-starting, will have his way made easy in the matter of a petrol licence at any of these offices, and should he require it, obtain an insurance voucher covering the value of his machine and protecting himself to the fullest extent. He is handed his badge, hoists it, and has the most useful passport existing in Motoring.

Should he meet with mishap, he will find the A.A. road patrol a friend in need; should he desire information regarding route, road or railway, the patrol will provide it. He is

the motorists' guide, philosopher and friend,

and his local knowledge is all embracing.

In answering this advertisement it is desirable to mention "The Motor Cycle."

He can render first aid to man and machine, can advise where the nearest Doctor, Post Office, Railway Station, or Garage is located. He will bring fuel or human aid to the stranded motor cyclist, and his sentry box is equipped with a telephone which often is a perfect Godsend to the unfortunate or careless. If any article of equipment has been lost, he becomes an enquiry agent, and the missing unit usually turns up a few days later at the A.A. headquarters in the loser's district.

As he salutes, he notes the number of your machine for his daily report.

Should your motor cycle be stolen,

or taken out for a joy-ride, these reports provide evidence useful in tracing thief or joy-rider.

First aid motor cycle combinations are provided to assist members in case of accident or breakdown. These machines are equipped with tools and material to deal with mechanical repairs and tyre replacements, also stretchers and medical sundries for first aid to the member or his passenger. They work in conjunction with the roadside telephones and can be summoned by the patrols in charge of sentry boxes.

The A.A. has erected thousands of direction signs on a plan which tells the traveller not only the nearest Village or Hamlet on his route, but also indicates the terminal points. In addition, there are thousands of A.A. Special Warning Signs erected at dangerous points of all roads in the Kingdom.

The Road Scheme of the A.A. includes the appointment and classification of Hotels. This classification is being constantly revised in accordance with reports from members and inspecting officials. It also includes the appointment of Road Agents, Motor Cycle Agents and Garage Keepers, in order to provide members with **assistance of a satisfactory skilled character** and to prevent overcharging.

In connection with its insurance of machines, the A.A. member possesses a special privilege. Should any dispute arise between him and the Insurance Company, a special Committee of the A.A. adjudicate on the matter promptly and pay the award they decide upon. In the case of any overcharge by motor cycle repairer or road agent, the A.A. on appeal, takes the matter in hand and secures the most favourable settlement. Should a member be prosecuted for any offence under the Motor Car Act or D.O.R.A., free legal defence is provided by the A.A. and the case fought in any court in the Kingdom. This alone is worth more than the membership subscription.

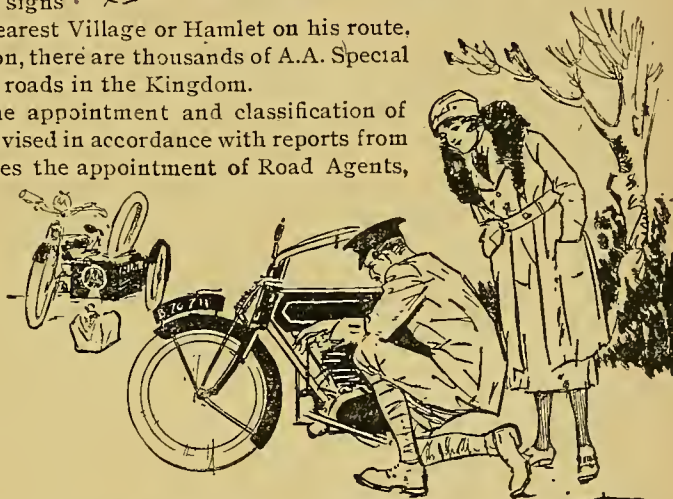
Should a tour on the Continent be projected, now that the way to peace is clear, the A.A. will be found indispensable to comfort and freedom from trouble with foreign Customs authorities. At any of the Headquarters the member is furnished with triptyques for the country or countries intended to be visited, and by merely indemnifying the Association through his Bankers

he will be relieved of the necessity for depositing actual cash in respect of the Customs dues levied on cars going abroad.

The A.A. is a safe and sure guide and the best friend of the motor cyclist in trouble.

Further information as to the privileges enjoyed by members of the Automobile Association is obtainable in booklet form from the Secretary, A.A. & M.U., 21, Farnham House, Whitcomb Street, London, W.C.2, and every motor cyclist who has not yet "joined up" should write for a copy.

In answering this advertisement it is desirable to mention "The Motor Cycle."



MISCELLANEOUS ADVERTISEMENTS.

PRICES.

ADVERTISEMENTS in these columns—First 12 words or less 2/6, and 2d. for every additional word. Each paragraph is charged separately. Name and address must be counted. Series discounts, conditions, and special terms to regular trade advertisers will be quoted on application.

Postal Orders and Cheques sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd., and crossed** Treasury Notes, being untraceable if lost in transit, should not be sent as remittances.

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.4), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge, which must include the words Box 000, c/o "The Motor Cycle." Only the number will appear in the advertisement. All replies should be addressed No. 000, c/o "The Motor Cycle," 20, Tudor Street, E.C.4. Replies to Box Number advertisements containing remittances should be sent by registered post.

DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pays carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged: when under £10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

MOTOR CYCLES FOR SALE.

A.B.C.

CROW Bros., High St., Guildford, have contracted largely for the new A.B.C. Order now for earliest delivery. [5298]

A.B.C.—Earliest deliveries; your name on our book ensures this.—**Martin Mitchell, Ltd.**, Wholesale Distributors, Stafford. [X9866]

A.B.C.—We are now taking orders for the new A.B.C. twin; order now for early delivery.—**P. Ellis and Co.**, 360, Little Rd., Fulham, S.W.6. [8460]

LIVERPOOL and District Agents for A.B.C. Place orders now to secure early delivery.—**Victor Horan, Ltd.**, 9, Parr St., Liverpool. [0003]

A.B.C.—Sole agents for these famous machines. A Orders booked now for early delivery.—**Chandler, Reyre, and Williams**, Sna St., Hitchin. [0996]

JONES' Garage.—We are in a position to accept orders for A.B.C. motor cycles; deposits optional; delivery April or May.—**Broadway, Muswell Hill, N.** [0991]

ISLE of Wight.—**Witham Bros.**, Newport, I.W., are Island agents for A.B.C. machines. Full particulars on request. Orders being booked for earliest delivery. [7515]

MAUDE'S

NEW MACHINES.

In order to save as much disappointment as possible, we want to make it quite plain that the only way to ensure delivery is to book your order. Deliveries are being made in the order they are received. To leave ordering over, in the hope of buying a machine when you want it, means waiting till next year.

Orders booked with us do not bind you legally to take delivery, you can cancel the order at any date, it only ensures you getting the machine in your turn.

MOTOR

Second-hand Machines.

As our stock changes so very rapidly, a list sent for publication would be out of date on the day of issue. We shall be pleased to forward our list upon application. If possible, we suggest a visit to our Show-rooms, so that you can see the various models we can offer.

MART

100, Gt. Portland St.,
London, W.1.

Telephone: Museum 557.
Telegrams: Abdicat, Weado,
London



MOTOR CYCLES FOR SALE.

A.B.C.

A.B.C.—Distributors for Scotland. Book your order now to ensure reasonable date for delivery.—**Edinburgh Pioneer Motors, Ltd.**, 50, Grindlay St., Edinburgh. [X8301]

FANCOURT'S Garage, Stamford, for A.B.C.'s; sole distributing agent for Seke of Peterboro' and County of Rutland; particulars and illustrations on request. [X9724]

WE Are New Booking Orders for earliest deliveries of A.B.C. motor cycle. Secure an early delivery by placing your order with us now.—**Dunwells' Garage**, Wigan. Tel.: 328. [X3219]

A.B.C.—Book early and prevent disappointment. Specification and full particulars will be sent on application.—**The Spalding Motor Co., Ltd.**, Spalding, distributing agents for Lincolnshire. [X6969]

DAN BRADBURY, 224, London Rd., Sheffield. sole A.B.C. distributing agent for Sheffield and district, will give you earliest possible delivery of the new A.B.C. motor cycles and light cars. [7270]

A.B.C.—Sole wholesale and retail agents for Oxfordshire and part of Buckinghamshire. Early deliveries guaranteed. Enquiries re sub-agencies welcomed.—**The Layton Garages**, London Rd., Bicester, or 90, High St., Oxford. A.B.C. enthusiasts. Phone: 35 Bicester. [9334]

Abingdon.

ABINGDON K.D. 3½ h.p. 2-speed Coachbuilt Combination; 45 gns.; 1914.—**Railway Garage**, Staines. Phone: 139. [1034]

ABINGDON King Dick 3½ h.p. 1914 Coachbuilt Combination, speeds, Palmer cord back, Service belt, Cowey indicator, Miller lamps, screen and hood, excellent outfit, nearly new condition; £55.—5, Royal Parade, Kew Gardens. [X0285]

A.J.S.

JACK HEALY, Cork.—Official A.J.S. agent.—Garage and works, Drinan St. [X8336]

CROW Bros., Guildford.—A.J.S. Agents since 1912. Write us for your requirements. [9777]

1919 A.J.S. Combinations.—Write Merrie's Stores, 174, Listerhills Rd., Bradford. Phone: 2439. [X2436]

A.J.S., 1913, 6 h.p., 3 speeds, Gloria spring wheel sidecar; £87/10.—**Collier's Motories**, Union St. South, Halifax. [9734]

A.J.S. Spares: engine and gear box repairs; prompt delivery.—**Cyril Williams**, Chapel Ash Depot, Wolverhampton. T.A.: Parts. [1069]

A.J.S., 6 h.p., 1918, new Mills-Fulford sidecar, ridden 150 miles, Lucas lamps and accessories; £145.—**Simons, Abbotts Langley, Herts.** [1068]

A.J.S. 6 h.p. and Sidecar, 3-speed, clutch, kick starter, good condition; £100, or offer.—**Millins**, The Firs, Spaniards Rd., Hampstead. [9582]

A.J.S., 6 h.p., 3-speed, clutch, k.s., Gloria sidecar, electric lights, perfect condition; £70; seen after 6 p.m.—15, Devonshire Rd., Brixley Heath. [X0219]

A.J.S. 6 h.p. 1914 Combination, Mills-Fulford, electric lighting, new tyres; nearest £95; any trial.—6, South Crescent, Store St., London, W.C.1. [X0477]

A.J.S.—For quick deliveries try the sole Leicester-shire agent, **Will Chapman**, 113, Belgrave Rd., Leicester, the first appointed A.J.S. agent. [3531]

23 h.p. 1915 A.J.S., 2-speed countershaft, kick-starter, hand clutch, horn, accessories, good condition; £60; after 7.—**Line**, 58, Abinger Rd., Bedford Park, W. [1106]

A.J.S.—**Exeter Motor Cycle and Light Car Co., Ltd.**, Bath Rd., Exeter, and 28, Tavistock Rd., Plymouth. Sole agents. Now booking for earliest deliveries. [0007]

A.J.S., 24 h.p., 1914 model, 3-speed, countershaft, enclosed all-chain transmission, kick start, handle-bar controlled clutch, detachable wheel, very good condition; £60.—**Crofts**, Low St., Sutton-in-Ashfield, Notts. [X0586]

A.J.S. 1917 Combination, little used, recently overhauled and tuned to perfection, spare wheel, hood, screen, storm apron, new Klaxon, toolkit, very good water-proof trousers; £145 gns., no offers; view 9-10 a.m.—2, Ashford House, High St., S.W.19. [9712]

1916 A.J.S. 4 h.p. Coachbuilt Combination, electric lamps, Stewart speedometer, mechanical horn, spare wheel with new heavy tyre, new spare Renolds chain, links, valve, etc., luggage grid, wind screen, apron; £120.—102, Lothian Rd., Stockwell, S.W.9. [9599]

A.J.S. 1915 (late) 4 h.p. T.T., excellent condition, Miller lamp, generator Lucas horn, rear light, auxiliary tank, Stewart speedometer, tyres good, several spares including wheel discs; £80; exchange cycle car.—**Capt. Haig**, O.T.T.S., Halton Camp, Bucks. [X9950]

MOTOR CYCLES FOR SALE.

A.J.S.

1918 6h.p. A.J.S., 3 speeds, best A.J.S. sidecar, 700x20 tyres, and detachable wheels all round, expensive lamp sets and Klaxon horn, guaranteed not been 200 miles, equal to brand new, ready to ride away; £175.—Willis, 49, High St., Saffron Walden, Essex. [X0399]
Phone: 45.

A.J.S. 5-6h.p. Twin Combination, 3 speeds, kick start, hand clutch, lamps, horn, and speedometer, Cameo screen, power unit perfect, whole condition practically as new; £105, bargain, no offers considered.—Coventry Motor Mart, Ltd., London Rd., Coventry. [X0614]

1915 6h.p. A.J.S. and Canelet Sidecar, 4-point attachment, interchangeable disc wheels, lamps, speedometer, now being entirely overhauled and re-enameled, ready 3 weeks, every part perfect, low mileage, really fast combination; seen Tunbridge Wells; nearest £120.—Bower, Mayfield, Sussex. [1125]

Alldays.

1915 Alldays-Matchless 2-stroke, Bosch mag., good condition; 50 gns.—337, Haydens Rd., Wimbledon. [9778]

ALLDAYS Matchless, 2½h.p. 2-stroke Villiers engine; £30; seen utter 6.—109, Streatham Rd., Balham. [X0593]

ALLON 2½h.p., 1915, 2-speed, lamps, speedometer, stored 2 years; £35.—14a, Alliance Rd., Plumstead, S.E. [1082]

£39/10.—2½h.p. Alldays, condition like new, climb anything, good running order; any trial against cash.—Rose and Crown, King's Langley, Herts. [1071]

ALLON 1913 2-stroke 2½h.p., 2-speed, lamps and horn, run few hundred miles, condition as new, £50; owner going abroad.—Nunn, 50, Cadogan Ter., Victoria Park, E.9. [1040]

ALLON, late 1918, 2-speed, h.c. clutch, leg shields, all accessories, oversize back tyre, externally kept and used; 50 gns.—Capt. Wynne-Yorke, Headquarters, Cranck Chase, Stafford. Tel.: 303. [X0533]

ALLDAYS Allon Motor Cycle, 2½h.p., 2-speed, 2-stroke, new Scaspray carburettor, very little used, ready to drive away; price £40.—Commercial Car Hires, Ltd., 112a, Junction Rd., Upper Holloway, N. [0015]

Ariel.

ARIEL 2½h.p., Bosch, B. and B., horn; 20 gns.—21, New North Rd., Reigate, Surrey. [9877]

CROW Bros., High St., Guildford, Ariel agents since 1913, have 1919 models in stock. [5298]

ARIEL 3½h.p., 3-speed, lamps, horn, new tyres, and coachbuilt sidecar; £260.—F. Wilderspin, Chatteris. [9598]

ARIEL 3½h.p. and 6-7h.p.: early deliveries.—F. Speakman, Ariel Expert, 7, Rye-dale Rd., Harpurhey, Manchester. [5269]

ARIEL 4h.p. T.T., nearly new condition, 3 speeds, lamps, mechanical horn, knee-grips, absolutely it; £42.—R.A.G., 32, High St., Reigate. [9882]

Arno.

1916 Arno, 4h.p., fixed engine, lamps, speedometer, good condition, ready to ride away; £36.—Barton, 22, Harleyford Rd., Vauxhall (near station). [9750]

Auto-Wheels.

AUTO-WHEEL, good as new; £7/15.—Wanchope's, 9, Shoe Lane, London. [1055]

WALLS' Auto-Wheel and Lea-Francis Bike, 3-speed; £20.—290, Brixton Hill, S.W. [9924]

WALL Auto-Wheel, splendid condition; £10/10.—8, Wordsworth Rd., Wallington. [9961]

AUTO-WHEEL, 500 miles, perfect order; £10/10.—Annaud, 19, Faton Rd., Coventry. [X0398]

AUTO-WHEEL De Luxe, accessories, perfect running; £9; deposit.—Tooley, Cookham, Bore-stal, Rochester. [X0510]

TWO Auto-Wheels, both in good condition and running order; £10 each.—B., 67, High St., Saffron Walden. [9840]

AUTO-WHEEL, B.S.A., as new inside and out, not done 200 miles; 10 gns.—King, Camp View, Strepsall, York. [1088]

Bat.

1915-16 Bat-J.A.P., 6h.p., canoe sports sidecar.—202a, Hammersmith Rd., W.6. [9906]

BAT-J.A.P., 6-9h.p. twin, mag., B. and B., free engine; £50.—Collinson, William St., Liversedge, Yorkshire. [X0256]

8h.p. Bat-Jap, spring frame, B.B., Bosch, very powerful; bargain, £45; after 5.—Tanner, 18, Hestercombe Av., Fulham. [9923]

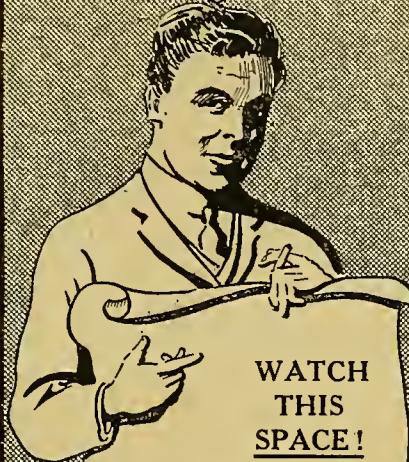
8h.p. Twin Bat-Jap Combination, 1912, 2 speeds, spring frame, new tyre, engine recently overhauled, good condition; £58.—39, Oakfield Rd., Clifton, Bristol. [X0118]

Blackburne.

CROW Bros., High St., Guildford, are old Blackburne agents, and can give early deliveries. [5300]

BLACKBURNE.—Sole agents. Book now for early delivery.—Chandler, Reyre and Williams, Sun St., Hitchin. [0999]

P.J. EVANS

THE BIRMINGHAM HOUSE FOR
MOTOR CYCLES &
LIGHT CARSWATCH
THIS
SPACE!I have Contracts for the
following Machines:—

MOTOR CYCLES.

Enfield, Rover, Norton,
Indian, Zenith, Triumph,
James, Fumber, Edmund,
Blackburne, Calthorpe,
New Imperial, etc.—

LIGHT CARS.

G.W.K., Standard,
Calthorpe.

LATER, I HOPE TO
SUPPLY THE GOODS.

*It will pay you to keep
in touch, and so ensure
early delivery of your
new mount.*

'Phone:
Mid. 662.

'Grams:
"Lytcar, b'ham."

P. J. EVANS,
87—91,
JOHN BRIGHT ST.,
BIRMINGHAM.

MOTOR CYCLES FOR SALE.

Blackburne.

JONES' Garage.—We can accept orders for all models of Blackburne motor cycles; delivery expected in April; deposits optional.—Broadway, Minswell Hill. [9992]

BLACKBURNE.—For earliest possible delivery consult the Oxfordshire sole agents.—The Layton Garages, London Rd., Bicester, or 90, High St., Oxford. Phone: 35 Bicester. [9353]

BLACKBURNE 3½h.p. T.T., late 1914, stored since 1915, perfect condition, fast, flexible, climb any hill, long exhaust, lamps, syren, real sporty machine; £56.—Wilcox, 23, Park Rd., Rugby. (Exchange considered.) [X0387]

Bradbury.

BRADBURY 4h.p., good condition; £36.—Rawlinson, Oxford St., Langdon Hills, Essex. [9775]

4h.p. Bradbury, free engine, T.T. bars, 1914, perfect; £35.—8, Wordsworth Rd., Wallington. [9960]

4h.p. Bradbury, in very good condition, tyres as new.—Cambridge Automobile Co., Cambridge. [1047]

BRADBURY 4h.p., Bosch, spring forks, lamps, and footboards, running order; £30.—Box L1,090 c/o The Motor Cycle. [9624]

BRADBURY.—For the earliest possible deliveries of 1919 models try the sole Manchester agent, Tom Davies, 229, Deansgate, Manchester. [6652]

BRADBURY, 4h.p., 1912, N.S.U. 2-speed, free, good tyres, tubes, belt, head lamp, generator; £25.—Root, 79, Huntingdon Rd., East Finchley. [9742]

1915 3½h.p. Bradbury, 3-speed, free engine, coachbuilt sidecar, splendid turn-out; £67/10, bargain.—Ashton, Thornhill Edge, Dewsbury. [X0206]

BRADBURY 1915 (September) 6h.p. Combination, 3-speed countershaft, detachable back wheel, new 700x20 Dunlop on back, just thoroughly overhauled by makers; £110.—Jones, Belgrave, Mountfields, Shrewsbury. [X0445]

1913 4h.p. Bradbury, 2-speed N.S.U. gear, thoroughly overhauled, new cylinder, complete, fitted torpedo side entrance wicker side car; £55.—Pressland, The Sub, Gloucester Rd., Hampton, Middlesex. [9973]

Brough

BROUGH early deliveries, sporting mount.—J. Blake and Co., Liverpool and Manchester. [X0439]

BROUGH 1916 3½h.p. Combination, Canoelet sidecar; 85 gns.—Lindaurst, 4, Petherston Rd., Highbury, N. [8338]

Brown.

3½h.p. Brown, mag., good running order, m.o.v., 32 lamps; £24.—3, Park St., Wellington, Salop. [X0506]

2½h.p. Brown, U.H. mag., B. and B. carburettor, 22 good running order; £12.—A. Gatch, Chesham House, Kettering. [9940]

2½h.p. Brown, low frame, R.B., Pridis, good tyres, 32 less mag.; seen running; £15, offer.—45, Stanbury Rd., Peckham, S.E. [X0393]

3½h.p. Brown, fitted with Osborne Grade gear, new 32 belt, mechanical valves, lamps and horn, accumulator ignition, in splendid running order; £15.—Sparks, 31, Broadwater Down, Tunbridge Wells. [9628]

BROWN, 3½h.p., 1917-18, Enfield 2-speed, only done 600 miles, B. and B., Bosch, Danlops, all accessories, with Canoelet sidecar, equal new; £75; will separate.—82, Gwendoline Av., Upton Park (after 6 o'clock). [1107]

B.S.A.

B.S.A., 3½h.p., fully equipped; £35, or best offer.—25a, Mount St., Brighton. [1084]

1917 B.S.A. Combination, just overhauled; £80.—Tippett, 37, Arlington Rd., Surbiton. [9874]

B.S.A. Combination, 4½h.p., 1914 clutch model, all accessories; £68.—26, Powell Rd., Clapton. [X0442]

NEW B.S.A.'s in stock: immediate delivery Model K.—Alexander, Agent, Wallasey Village. [1506]

B.S.A., 3½h.p., 2 speeds, countershaft, nice condition; £40.—211, Garratt Lane, Wandsworth. [1120]

1916 B.S.A., 4½h.p., 3 speeds, with 28 gn. sidecar; £85; wanted, light car.—Mermaid Cottage, Rye. [9578]

1913 2-speed B.S.A.; best offer over £45; seen by appointment.—Hutchison, 6, Leyland Rd., S.E.12. [9697]

B.S.A., late 1913, clutch, Watsonian coachbuilt sidecar, £53; also Brown, £26.—49, Well St., Hackney. [1126]

B.S.A., 1919 models, delivery first week June.—Hadow's Motor and Cycle Works, 130, Camberwell Rd., S.E.5. [X0322]

B.S.A., 3½h.p. clutch model, new tyres, very fast, excellent running order; £45.—"Chelet," Rutland Rd., Bournemouth. [X0329]

B.S.A., 3½h.p., semi-T.T., perfect order, thoroughly overhauled; offers.—G. Reeves, Guildford Rd., Farnborough, Hants. [9950]

B.S.A., 1919 models, early deliveries.—Bastone's, 228, Pentonville Rd., King's Cross, London, N.1. Tel.: 2481 North. [919]

MOTOR CYCLES FOR SALE.

B.S.A.

1919 B.S.A. Combination, delivery before Whitsuntide, owner not requiring; what offers?—Box 11,089, c/o *The Motor Cycle*. [9623]

B.S.A. Combination, just overhauled, plated, enamelled, 3-speed, chain-cum-belt, clutch, kick start.—T. W. Shaw, Wellington, Salop. [X0508]

B.S.A., 3½ h.p., splendid condition, adjustable pulley, lamps, horn, new Dunlops; £45.—259, Brownhill Rd., Calford, S.E.6. [9688]

B.S.A., believed 1917, 3-speed, under 3,000, fully equipped, perfect condition, C.B. sidecar; £90. lowest.—Mildard, Gilbert Rd., Belvedere. [9388]

B.S.A., 1913, 2-speed hub gear, complete with levers, kick starter, brake, 26in. wheel, tyre and inner tube; £15.—89, Abbey Rd., St. John's Wood, N.W.8. [9723]

1919 B.S.A. K, sporting coach sidecar, 3 lamps, Klaxon, delivered April, insured, unscratched, buying car; £106.—47, Braydon Rd., Stamford Hill. [9839]

B.S.A. 4½ h.p. Combination, 1917-18, very little used, streamline coachbuilt sidecar, first-class accessories; trial; price £120.—Major Rummings, Tidworth, Hants. [X0409]

B.S.A., 1912-13, wicker sidecar, 3½ h.p., 2 speeds, excellent condition, powerful, reliable; seen any time, trial after 5.30; £39.—41, Codrington Hill, Forest Hill, S.E. [9858]

B.S.A., clutch, 3½ h.p., little used, lamps, horn, spares and tools, tyres, enamel, and plating in excellent condition; £45 cash.—Adams, 41, Lawford Rd., Rugby. [X0363]

B.S.A., 4 h.p., 3-speed, chain-cum-belt, exceptionally little wear, not 2,000 miles, complete with head lamp and horn; £63.—Evans, 27, Richmond Av., Willsden Green. [9570]

1918 (May) B.S.A., 3-speed, clutch, countershaft kick starter, lamps, new tyres, little used, in splendid condition, £80; sidecar £12; after 7 o'clock.—171, Cumberwell Grove, S.E.5. [X0404]

B.S.A. Sole district agents.—For earliest possible delivery and best service, try The Layton Garage, London Rd., Bicester. B.S.A. Specialists. Phone: 35 Bicester. [9333]

LATE 1913 B.S.A., 3½ h.p., 2-speed gear, free engine, lamps, speedometer, been stored 3 years, condition as new; £48.—After 6 p.m., 55, High St., Addlestone, Surrey. [X0198]

B.S.A.—For the earliest possible deliveries of 1918 models, specifications, and prices, sole district agents, The Walsall Garage, Wolverhampton St., Walsall. Phone 444. [4669]

1915 3-speed 4½ h.p. B.S.A. Combination, chain-cum-belt drive, tyres new, machine completely overhauled; £90.—Dollman, seen at 8, The Village, Old Charlton, S.E.7. [9916]

B.S.A. Combination, 1914, 4½ h.p., 3-speed countershaft, kick starter, chain-cum-belt, lamps and spares, the whole in excellent condition; any trial; £70. lowest.—Bray, 121, London Rd., Coventry. [X0585]

4½ h.p. B.S.A. 1914 all chain Combination, mechanically excellent, tyres very good, family sidecar, upholstery poor, lamp, horn, speedometer; £80.—Saxelby, Stretton-on-Dunsmore, Rugby. [X0361]

1919 B.S.A. Combination, 4½ h.p., chain-cum-belt and coachbuilt sidecar, with Lucas acetylene lighting set, horn, absolutely new, not done 300 miles; price £115; appointment only.—Reddall, King St., Dunstable. [X0424]

B.S.A., 4½ h.p., 3 speed, clutch, kick starter, coachbuilt sidecar, delivered December, 1918, absolutely perfect condition, not done 700 miles; bargain, 100 gns.; this machine is practically in same condition as when it left works; seen by appointment.—E.W.L., 30, Paternoster Row, E.C.4. [9616]

1913 4½ h.p. B.S.A. Combination, everything beautiful condition, encased weatherproof chain drive, kick starter, 2 speeds, free engine, tyres good, sidecar (light coachbuilt Canoelet), nearly new; £90, nearest cash offer secures.—Apply after 5 o'clock, D. W. Miller, 15, Malvern St., Burton-on-Trent. [9793]

B.S.A.—The Birmingham City agents and specialists who confine their business absolutely to B.S.A. manufactures always holds the most complete stock of motor cycles, sidecars, bicycles, etc., and can give immediate delivery of all replacements.—The County Cycle and Motor Co., 307-8, Broad St. Phone: Midland 733. [7250]

4½ h.p. B.S.A., 1916, chain drive, 3-speed, free engine, clutch, Chater-Lea sidecar, P.H. head lamp, T.W.R. rear lamps, speedometer, Barton horn, very complete spares, tools, thoroughly overhauled, re-enamelled March, been stored, carefully ridden; reason sale owner going overseas; really sound outfit; trial by appointment; £100, lowest.—Lt. Lewis, Rye Close House, Bedford. [X0194]

Calthorpe.

HENDON.—Calthorpe Junior, 1915, 2-speed Precision, good; £32.—22, Aconesley Av., Collindale. [9698]

CALTHORPE 2 h.p. Precision Junior; £30.—J. M. Gummerson, 5, John's Place, High St., Acton, W.3. [1076]

CALTHORPE-PRECISION 1915 2½ h.p., 2-speed countershaft; £31.—10, Puget Rd., Lordship Park, N. [9821]

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MOTOR CYCLES FOR SALE.

Calthorpe.

1915½ Calthorpe-Jap, Enfield 2-speed, all accessories; any trial; 38 gns.—Weybourne Cottage, Farnham, Surrey. [9932]

1915 Calthorpe Junior, 2½ h.p., 2-speed, condition as new; £35; after 7.30.—45a, Duntshill Rd., Enfield, S.W. [9893]

CALTHORPE, 2½ h.p., 2-speed, lamps, etc., good tyres, enamel and plate as new; £32.—120, Sutherland Rd., West Croydon. [9754]

CALTHORPE Junior, 2-speed, lamps, in splendid condition; £30.—White, 118, Barry Rd., Stonebridge, Willesden, N.W.10. [9647]

CALTHORPE-J.A.P., 2½ h.p., Enfield 2-speed, new Dunlops and belt, all accessories; £35.—King, Camp View, Streusall, York. [1087]

CALTHORPE Junior, 2 h.p., 1914, enamel as new, plating good, new cylinder, valves, etc.; £27.—Trulocke, 7, Corn St., Witney, Oxon. [9983]

CALTHORPE 1916 2½ h.p., 2-speed, 2-stroke, excellent condition, new spare cover, horn; £35.—The Towers, Quorn, near Loughborough. [X0592]

CALTHORPE-J.A.P., Sept., 1915, 2½ h.p., 4-stroke, Enfield 2-speed, fully equipped, fine condition; £42/10.—Kirkland, Hightown Rd., Banbury. [X9977]

1914 Calthorpe-Jap 2½ h.p., Enfield 2-speed countershaft, mag. requires slight attention; bargain, 25 gns.; Sprayray.—White, 1, High St., Frimley, Surrey. [9887]

1914 2½ h.p. Calthorpe-Precision, 2 speeds, almost new condition, been stored several years, P.H. lamps, horn, etc.; £35.—21, Brent St., Hendon, N.W.4. [X0368]

1914 2 h.p. Calthorpe-Precision, perfect condition, only ridden 500 miles, untouched since June, 1915; £30 immediate cash.—Wells, 27, Hastings Rd., Ealing. [1124]

CALTHORPE Lightweight, 1914, Precision engine, in perfect condition, speedometer, lamps, stored since 1916; £30.—Cranston, Jerviston St., New Stevenston, Holytown, Scotland. [X0227]

CALTHORPE Combination, 4 to 5 h.p. J.A.P., late 1916, mechanically perfect, Enfield gears, handle starter, fitted auxiliary tank, spares; £70.—"Caterham," Hamstel Rd., Southend-on-Sea. [8537]

1914 Calthorpe-Precision 3½ h.p., 3-speed, clutch in Sturmer-Archer hub, complete with light coachbuilt sidecar, horn, tools, etc., excellent running order; inspection, trial; offer nearest £65 secures.—9, Kendrick Rd., Reading. [X0312]

Centaur.

CENTAUR Lightweight, Bosch, B. and B., new tria and belt; £16.—St. Aubins, Elm Grove, Wimbeldon. [X0529]

Chater-Jap.

4 h.p. Chater-Jap, Bosch, Druids, fast, reliable; £30.—T. W. Shaw, Wellington, Salop. [X0505]

Chater-Lea.

CHATER-LEA, 3½ h.p., B. and B., mag., good condition; £27.—28, Bexley Rd., Belvedere, Kent. [9748]

8 h.p. Chater-Lea Combination, 3-speed gear box, in perfect condition; £80.—Watson, 6, Drake St., York. [X0532]

CHATER-LEA No. 7 Combination, upholstered carrier seat; £110.—Hollymount, Blackheath Hill, Greenwich. [1021]

NO. 7 8 h.p. Chater-Lea Combination, with 2-seater coachbuilt sidecar, hood, screen, thoroughly overhauled; what offers?—Apply, Burch, Tavistock. [X0328]

Chater-Minerva.

3 h.p. Chater-Minerva, C.A.V. magneto, Amac, T.T. bars; £15.—39, Lime Grove, New Malden. [1005]

Chater-Peugeot.

CHATER-LEA-PEUGEOT 5-6 h.p. Twin, N.S.U. gear, Bosch, Senspray, drip feed, good tyres, perfect running order; £35.—Sgt. Simpson, Canadian Ordnance Office, Ashford, Kent. [9568]

Clyno.

CLYNO, 2-stroke, 2-speed, hand clutch; 56 gns.; delivery this month.—Martin Mitchell, Ltd., Stafford. [X9867]

CLYNO 8 h.p. Combination, the model superb; deliveries June.—Martin Mitchell, Ltd., Stafford. [X9368]

CROW Bros., High St., Guildford, West Surrey agents for the 1919 Clyno. Order now to ensure early delivery. [1553]

CLYNO 5-6 h.p. Twin, 2-speed, 1914, good order, Palmer cord tyres; £62.—Knappe, 39, High St., Bedford. [X0350]

CROVER, Smith and Willis, Basingstoke.—Agents for Clyno combination. Don't wait until the fine weather comes before placing your order. [6263]

CLYNO Combination, 6 h.p., 3-speed, countershaft, spare wheel, excellent condition; £95.—Aveling, Estover, March. [X0195]

MOTOR CYCLES FOR SALE.

Clyno.

CLYNO Motor Cycle with sidecar, 6h.p., 1912 model, just overhauled throughout.—To be sold by auction on Thursday, May 15th, at 12 o'clock, at the Forge, Tottenham, N.20. [9703]

6 h.p. Clyno Combination, late model, been stored, excellent condition, like new, spare wheel and lamps, complete; £126.—Freethe, 5, Cornwall Parade, Church End, Finchley, N.3. [9611]

CLYNO 6h.p. Combination, 3-speed, interchangeable wheels, screen, speedometer, lamps, horn, spring luggage and petrol carrier, completely equipped, very smart outfit, as new; 95 gns.—156, New King's Rd., Fulham, S.W. [9618]

1919 8h.p. Clyno Combinations. Deliveries commence in June. Place your order with us at once to ensure early delivery. 1919 Clyno 2-strokes; deliveries this month; order at once.—Kays, 116-122, Pitsbanger Lane, Ealing. Tel.: 553 Ealing. [9694]

CLYNO, late 1914, 5 to 6h.p., 3-speed countershaft combination, new condition, mileage 2,600, speedometer, wind screen, 3 lamps, 2 horns, spare interchangeable wheel, new 31a heavy Dunlops back and front; £110, no offers.—21, North Terrace, Inchicore, Dublin. [1109]

CLYNO Coachbuilt Combination, 1914-15, 6h.p., 3-speed, K.S., all-chain drive, detachable interchangeable wheels with spare wheel, re-enamelled and overhauled, splendid condition, good tyres, lamp, horn, etc., stored during war; a bargain, £110.—Tel.: Harrow 188. [1112]

Coulson.

COULSON B.; order now.—J. Blake and Co., Liverpool and Manchester. [X0440]

Corah.

1916 Corah 3½h.p., 2-speed, countershaft, clutch, first-class order throughout; trial; £37/10.—212, Church St., Wolverton. [9981]

Coventry Eagle.

COVENTRY Eagle Lightweight Combination, Villiers engine, 2-speed countershaft, Senspar, Canoelet Minor sidecar, accessories, spare belt and chain, head lamp, perfect running order; £55.—Bell, 1a, Balgore St., Gidea Park, Romford, Essex. [9900]

Dayton.

DAYTON, 2h.p., Amac carburettor, fast, mag., Druids, horn; first £27; after 6.30.—112, Fifth Av., Queen's Park, W. [9744]

Diamond

2½h.p. Diamond, 4-stroke, 2-speed, kick, chain drive, clutch; £40.—Jeweller, 13, New St., Wellington, Salop. [X0507]

Douglas.

THE Douglas has set the fashion to the world.—Below.

GOURLAY, the Great Douglas Agent, Fallowfield, Manchester. [X0414]

DOUGLAS 1915 2½h.p., T.T., excellent condition; £45.—Box L1,140, c/o The Motor Cycle. [9805]

DOUGLAS, 1913, 2½h.p., single speed, good condition.—Nash, 48, High St., Grays. [9872]

DOUGLAS, 2½h.p., 1911, perfect condition; £30.—Mays, 62, Queensmill Rd., Fulham. [9908]

DOUGLAS.—Send your enquiry as to delivery to The Layton Garages, London Rd., Bicester. [9336]

BERRY'S.—2½h.p. Douglas, 2-speed, almost new; bargain; £55.—125, Canal Rd., Mile End. [9966]

DOUGLAS, 2½h.p., 1916, lamp, horn; £55.—A. Johnson, Vale House, Tonbridge. Letters only. [1060]

2½h.p. Douglas, 1913, recently overhauled, perfect condition; 40.—Box L1,144, c/o The Motor Cycle. [9809]

DOUGLAS, 1916, 2½h.p., T.T., 2 speeds, excellent condition, fast; £55.—5, Victoria Av., Surbiton. [X0607]

DOUGLAS 1916 2½h.p., 2-speed, T.T.; £55.—F. J. P. Disney, Rossie, Gloucester Rd., Kingston Hill, Surrey. [9930]

DOUGLAS 2½h.p., 1917 W.O. model, 2-speed, splendid condition; £60.—87, Little Heath, Old Charlton, S.E.7. [9881]

GIBB, The Douglas Expert, Gloucester, is the man to get in touch with for best deliveries and advice. Phone: 852. [4749]

DOUGLAS, 2½h.p., 2-speed, W.D. model, perfect condition; 50 gns.—53, Pelham St., S. Kensington. [1127]

DOUGLAS 2½h.p., 2-speed, excellent condition, new tyres, accessories.—Hobden, Albany Rd., Salisbury. [1043]

1914 Douglas, 2½h.p., 2-speed, good running order; first offer £50 secures.—Symons, 30, Riggindale Rd., Streatham. [9849]

DOUGLAS 4h.p. Combination 1919, new March, 200 miles, perfect condition; £100.—Whitman, 54, West View, Clutheroe. [X0520]

1913 2½h.p. Douglas, 2-speed, sporting model, very fast, just overhauled; any trial; £40.—Empson, Gamlingay, Beds. [1026]

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MOTOR CYCLES FOR SALE.

Douglas.

C. BERRY'S.—1915 3-speed countershaft clutch kick start Douglas combination; bargain, £60.—125, Canal Rd., Mile End. [9965]

DOUGLAS Prompt delivery. 4h.p. combination. £105; War Office 2½h.p. model, £60, new.—Moffat, Yeovil. Phone: 50. [1103]

DOUGLAS 2½h.p., 1915, 3-speed Colonial Model, good order, used little for 2 years; £55.—Crisp, jun., Goodwin Rd., King's Lynn. [X0397]

1919 W.D. 2½h.p. Douglas, run 200 only, as new; what offers?—Lloyd, Cranbourne Lodge, Winkfield, Windsor. Tel.: Winkfield Row. [9772]

DOUGLAS, 1913-1914, T.T. model, fully equipped, and in perfect condition and running order; £35.—Lt. Turner, Walling, Stockbridge, Hants. [9866]

DOUGLAS 2½h.p. Colonial Model, 2-speed, spares, tools, Klaxon, and all accessories, as new; £55; after 6.—39, Pennard Rd., Shepherd's Bush. [9691]

1915 W.D. Douglas, perfect condition and running order, extra good puller, tyres perfect; £45.—H.D.K., R.N., Bolmore, Hayward's Heath, Sussex. [9791]

1915 Douglas, 2½h.p., 2-speeds, clutch model, kick-start, £52; can be seen in the evenings between 6 and 7.—Richards, 149, Kentish Town Rd., N.W. [9667]

1915 Douglas Combination, 4h.p., 3-speed, kick starter, clutch, electric lighting, wind screen; £95, or part exchange solo.—Letters, R.P., 36, Wynne Rd., Brixton, S.W. [9820]

DOUGLAS 2½h.p. 2-speed, clutch, kick start, new tyres, splendid order throughout, fully equipped; £48.—Speechey, 1, Gunnersbury Lane, Acton Hill, London. [9975]

DOUGLAS, 1914, semi-T.T., 2½h.p., lamp, generator spare belt and case, horn, tools, long exhaust; 47 gns.—Write, Lawrence, Lawrence House, Millersbury, Herts. [9753]

DOUGLAS, 4h.p., 1915, 2 speeds, K.S., perfect condition, very little used, good tyres, lamps, horn; £75.—Major English, Berrington War Hospital, Shrewsbury. [X0465]

1915 Douglas T.T., 3-speed, 2½h.p., Dixie, Amac, lamp, horn, tools, spares, overhauled February; £52, lowest.—Holman, Technical Staff Mess, R.A.E., Farnborough, Hants. [X0394]

1915 Douglas, 2½h.p., 2-speed, T.T., new tyres, belt, saddle, toolbags, and new Amac carburettor, brand new condition, mileage under 300; £56.—Martin, 8, Greave St., W.C. [X0450]

1914½ Douglas, 2-speed, perfect going order, semi-T.T. bars, knee grips, footboards, new mud guards, Dunlops; bargain, £46/10.—Hough, 18, Archway Rd., Highgate, N.19. [1131]

DOUGLAS, T.T., 2½h.p., 1913, 2 speeds, long exhaust, every fast, good tyres, lamps, Klaxon, all tools; £42; write for appointment.—E. Burrough, 104, Vineyard Hill, Wimbolden. [X0269]

DOUGLAS, late 1915, 2½h.p., 3-speed, semi-sporting handle-bars, long exhaust, head light, spares, excellent running condition; any trial; £56 cash.—Cotton, Newbury Park, Ledbury. [1129]

DOUGLAS, 2½h.p., 1914 or 1915, not used since 1915, owner dead, as new, speedometer, electric lamps, horn, perfect throughout, only wants seeing; £50, bargain.—Smith, 3, Parade, Staines Rd., Bedford, Middlesex. [1006]

DOUGLAS.—We have two twin Douglas combinations, ex-army sales; shortage of mechanics prevents us from overhauling these, and we can offer at £74 and £85 respectively.—Maudes', 100, Gt. Portland St., London, W.1. [1056]

ELI CLARK can give you good advice also good deliveries of 1919 Douglas motors. He will help you if possible with spares. The man on the spot.—196, Cheltenham Rd., Bristol. Phone: 4169. Wire-ignition, Bristol. (Please do not send sample spares.) [9966]

1919 W.D. Model Douglas Combination, with lamps, tools, and several spares, including belt and chain, mount purchased late February last; accept £115, no offers. Trial evenings after 7 p.m. by arrangement.—Write R. Hughes, Woodfield, Redberry Grove, Sydenham. [9028]

2½h.p. Douglasses, brand new, fitted 2-speed gears, 24 touring or semi-T.T. bars, footboards 15/6 extra; £60; two best lamp sets, horn, registration, writing number plates, 24/6 extra; specification with dates of delivery by post.—Douglas specialists, Robinson's Garage, Green St., Cambridge. Tel.: 388. T.A.: Bicycles. [1114]

4 h.p. Douglasses, brand new, fitted 3-speed gears, clutch, kick-start, with Douglas coachbuilt sidecar, £105; 3 lamp sets, horn, registration, writing number plates, 25/10 extra; specification with dates of delivery by post.—Douglas specialists, Robinson's Garage, Green St., Cambridge. Tel.: 388. T.A.: Bicycles. [1115]

Etswick.

ELSWICK Combination, 1914, 3-speed, clutch, drip feed, all accessories; £50; exchange lightweight part.—36, David Lane, Shadwell, E. [9913]

MOTOR CYCLES FOR SALE.

Enfield.

ENFIELD 1916 6h.p. Combination; 110 gns.—29, St. Leonard's St., Bromley-by-Bow. [9860]

ENFIELD 2½h.p. Twin, very good order; £30.—29, St. Leonard's St., Bromley-by-Bow. [9861]

ENFIELD, 1919, 3h.p., never been ridden; what offers!—59, Glaugarry Rd., E. Dulwich. [9745]

ENFIELD, 2½h.p., in good condition, new back tyre; £26.—Steward, 33, Knox Rd., Forest Gate, E.7. [X0518]

ROYAL Enfield, twin, disc wheels, just overhauled; £45.—Skew, Wenham House, Woodbridge Rd., Guildford. [9643]

ENFIELD 8h.p. Combination, splendid condition, disc wheels; after 6 p.m.: £115.—156, Browning Rd., East Ham, E. [9896]

1916 3h.p. Enfield, 2-speed, K.S., excellent condition, just overhauled; 60 gns.—26, Addison Av., London, W. [9959]

ENFIELD 1914 3h.p., 2-speed, perfect condition, good tyres; £45.—1a, Devonshire Rd., Holloway, N. (After 6 o'clock.) [9678]

1916 Enfield 2-strokes, new oversize Palmer tyres, mechanically perfect; £37.—McNaught, 29, Sharbrooke Av., Glasgow. [X0400]

1916 Enfield Combination, electric light, all accessories, original Palmer cords; £120.—51, Glenelldon Rd., Streatham, S.W. [9938]

ROYAL Enfield 6h.p. Combination, 1918; £115: or would consider lower power and cash.—Box 3,439, c/o The Motor Cycle. [X0111]

ENFIELD 6h.p. Combination, 1919, fully equipped, lamp, hood, tools, etc., brand new; £160.—76, Handoe Rd., Lee, Kent. [9969]

ENFIELD, 1914, 3h.p., Bosch, Amac, P. and H. lamps, tyres good, 2-speed, running order; £40.—Perrice, Rye Hills, Silloth. [X0366]

ENFIELD 3h.p. 1916 Twin, only ridden 500 miles, lamps, horn, complete, as new; after 5 p.m.: Cooper, 47, Catford Hill, S.E.6. [X0535]

ENFIELD 8h.p. Combination, 1915-16, perfect condition, little used, any trial, lamps, horn, etc.: £115.—Slater, 88, King St., Blackburn. [X0110]

1919 Enfield and Sidecars, new and slightly used, complete with lamps, horn, oversize tyres; £145 to £120.—16, Hesper Mews, Earl's Court. [9594]

1917 Royal Enfield 2½h.p., 2-stroke, 2-speed, free engine, lamp, necessary tools, splendid condition; £44.—Homer, Lister Institute, Chelsea. [9926]

ENFIELD. Sole district agents.—For earliest possible deliveries, try The Layton Garages, London Rd., Bicester. Phone: 35 Bicester. [9335]

6-h.p. Royal Enfield 1914 Combination, speedometer, new tyres and tubes, excellent condition, 3 years store; £130.—Norman Cycle Works, Bridge St., Maidenhead. [9901]

ENFIELD 3h.p. Twin, 2-speed, new Dunlop and Palmer, Bosch shaft drive, just overhauled, gas lamps, horn, pump; £25.—Box 3,440, c/o The Motor Cycle. (D) [X0128]

ENFIELD Combination, 6h.p., new in 1914, hood and screen, nice condition, stored considerable time; £98.—31, Haversham St., Goodwood St., Stapleton Rd., Bristol. [X0605]

LATE 1915 6h.p. Enfield and Sidecar, as new, unscratched, mileage under 3,000, 3 lamps, generators, speedometer, horn, etc.; £100, lowest.—Apply, Box 3,464, c/o The Motor Cycle. [X0426]

ENFIELD 1918 8h.p. Combination, in new condition, run 2,500 miles only, with £12 worth accessories and spares, guaranteed perfect; £130.—Watson, 132, High St., Aldeburgh, Suffolk. [9994]

BRAND New Royal Enfield 8h.p. Combination, Palmer cord oversize tyres, acetylene head and sidecar lamps; £145, no offers; seen after 6 p.m.: C. Willmet, 35, Jervis Rd., Fulham, London. [9746]

ROYAL Enfield, 2½h.p., twin, 2 speeds, chain drive, 1918 B.B., tyres good, camelling and plating as new, 2 lamps, all in excellent condition; 32 gns.—After 7, Davis, 30, Beaconsfield Rd., South Tottenham, N.15. [9646]

ENFIELD, 3h.p., 1915, 2-speed, kick start, P. and H. head lamp, Lore generator, Lucas horn, Coway speedometer, good tyres, Watsonian lightweight sidecar, property of naval officer now abroad, combination good order throughout; £65.—Southfields, Sutton Common, Surrey. [X0454]

1914 Royal Enfield 6h.p. Combination, stored during war, in first-class condition, sidecar just completed, fitted with hood, screen, and spring luggage carrier, 3 lamps, 2 large generators, exceptionally fine engine, the whole in first-class and perfect order; £90: can be seen and tried by appointment only.—47, Broadway, Coventry. [X0389]

Excelsior.

AMERICAN Excelsior; place orders now.—J. Blake and Co., Liverpool and Manchester. [X0441]

1917 Excelsior Combination, 6h.p., 3-speed counter-shaft gear, coachbuilt not done 1,000; £100.—Ellingworth, New Inn Yard, Kendal. [X0116]

A Question of Policy.

As every Motorist knows, there is a dearth of mounts, because for various reasons factories are not yet producing 1919 models in quantity. This state has brought into being the "waiting list," by which means the man who has decided on the make he will ride can place an order covered by a small deposit and rest assured that he will receive delivery in strict accordance with his position on the list, but in advance of the prospective buyer who expects to blow into a depot and purchase from stock. The number of deliveries from stock this side of November won't keep the Registration Dept. very busy.

It is here that the question of policy arises. Shall a dealer accept orders for which he can only pass on the maker's promise of delivery, or shall he refuse to sell until he has the goods actually in stock? We have chosen the former policy because as buyers we had to adopt it or we should be left in the lurch. Imagine a Motor Trader going round the Manufacturers next June, saying, "Sir, all the men in my district go on their holidays next month so I'll buy those 'buses I see in the test shop." Only one guess is needed at the answer.

What about YOU, patient reader, what of your policy? Will you wait to see and then spend the Summer walking, or get on the hated waiting list and ride?

If you fancy one of the good makes we sell, get in now and let us quote you approximate delivery.

Victor Horsman Ltd.

Parr Street, Slater Street,
LIVERPOOL.

AGENTS FOR:—

NORTON, INDIAN, A.B.C.,
VELOCETTE, HAZLEWOOD,
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LEDS LIGHT CARS.

MOTOR CYCLES FOR SALE.

Excelsior.

AMERICAN Excelsior Coachbuilt Combination, dynamo lighting, and horn, not ridden since completely overhauled and re-camelled; £110, no dealers.—Hall, 2, Rodney Cottages, Clifton, Bristol. [X9962]

EXCELSIOR, American, late 1916, 7-9h.p., T.T. model, 3 speeds, clutch, kick start, racing sidecar, ear head and rear lighting, Klaxon, speedometer, spares; this machine is mechanically perfect; £120.—Broad, Fruiterer, 76, Hornsey Rise, London, N. [9747]

Fafnir.

FOR Sale, 8-10h.p. Fafnir, 2-cyl. water-cooled engine, complete, with Bosch mag. and carburettor; £20.—A. R. Montgomery, Victoria Rooms, Bristol. [X0278]

F.N.

F.N., 4-cyl., in running order; £22.—104, Blough Rd., Battersea. [1014]

F.N. 4-cyl. 4-6h.p., Bosch mag., shaft drive, engine good condition; £20.—69, King Edward Rd., Rugby. [X0401]

F.N., 4-cyl., 6h.p., clutch, kick start, excellent condition; £45; after 6 p.m.—Apps, 12, Stanley Gardens, Hampstead, N.W.3. [9863]

5-6h.p. F.N., engine perfect, Bosch, fixed gear; highest over 225, or exchange twin; after 7.30.—526, Heckford Rd., Brixton, S.W.9. [9718]

1914 F.N., 2-speed, Bosch mag., horn, front and rear lamps, excellent condition, ready to ride away; £35, no offers.—E.C., 58, Chapel St., Dalton-in-Furness, Laacs. [X9971]

Grandex.

GRANDEX 1914 T.T. 3½h.p., twin Precision engine, Enfield 2-speed, all chain drive, Bosch mag., lamps and horn, tyres good, petrol capacity 3 gallons, good running order; £55, or near offer.—Hesketh, Pleasington, Blackburn. [X9973]

4½h.p. Grandex-Precision 3 speeds, free engine, 4 overhauled, new tyres and tubes in January; would exchange for 2½h.p. Douglas, Enfield, or Levis, or sell £40.—36, Victoria Rd., Askrum, near Doncaster. [X0466]

Harley-Davidson.

HARLEY-DAVIDSON, 7-9h.p., late 1915, only had 3 months' wear; £80.—Arthur Belcher, Wantage. [X0226]

HARLEY-DAVIDSON Combination, believed late 1916, mag. model, Canoelet sidecar, good condition; £100.—Rider, 3, Moorcroft Terrace, Rotherham. [X0280]

HARLEY-DAVIDSON Combination, 1915, mag. model (Bosch), fast, powerful, speedometer, lamps, horn, etc.; £110; consider exchange.—Guest, 73, Church St., Rugby. [X0388]

LATE 1915 7-9h.p. Harley, electric model, 3-speed, kick start, in beautiful condition, been stored during restrictions; £90; ready to ride any distance.—32, Hartley St., Ulverston, Laacs. [X0370]

GENUINE 1916 T.T. Harley, double tank, pedal start, clutch, mileage under 1,000, enamel very good; best offer accepted, or would exchange for good single.—Box L1,163, c/o The Motor Cycle. [1095]

1915 Harley-Davidson, 7-9h.p., 3-speed, mag. model, with Gloria spring wheel sidecar, Triplex wind screen, etc., overhauled and re-enamelled grey; offers above £95.—Walker, Inct Farm, Broseley, Salop. [9852]

HARLEY-DAVIDSON Combination, late 1915, dynamo lighting, Bosch mag., 2 large sets head lamps, magnificent condition, new tyres, etc.; 100 miles trial; £112 cash.—Godfrey Attwood, 13, Park Terrace, Swindon. [X0407]

HARLEY-DAVIDSON Combination, late 1915, to perfect running order, lamps, mechanical horn, speedometer, 2 new tyres, wind screen, appearance as new; best offer over £115; can be seen at Newmarket by appointment.—Wheeler, Gessys Hall, Wickhambrook, Newmarket. [9823]

HARLEY-DAVIDSON 7-9h.p. Combination, 1918 (Nov., '15), No. L13652K, been stored, overhauled, and all like new, electric lighting, electric horn, front and back brakes, luggage rack, hood, screen, apron, mirror, etc., a superb turn-out; £130 cash, lowest for quick sale.—"Moorside," Hereford Rd., Harrogate. [X0211]

HARLEY-DAVIDSON Combination, 1915, bushes and bearings perfect, general condition excellent, been in careful service for total of 19 months, 14 as solo mount, stored whilst owner at the Front, Mills-Fulford coachbuilt sidecar (4-point) fitted January this year at cost 19 gns., tyres new (unpunctured), driving sprocket and chains new, acetylene installation, Klaxon, large tool kit, mag. (Bosch), speed guaranteed, average 30 all day if desired; £95: no lower offer.—Lieut. Millett, St. John's College, Oxford. [X0391]

Hazlewood.

HAZLEWOOD 5-6h.p. Coach Combination, chain, belt, Armstrong gear, all accessories, wind screen, etc.; any examination or trial; £75.—51, Church St., Wolverton. [9766]

HAZLEWOOD, 5-6h.p. J.A.P., engine No. 52508, 3-speed gear box, latest pattern, as new, large sidecar with child's seat, hood and screen, perfect condition; seen by appointment; £115.—67, Marlborough Rd., Wimbledon Park, S.W. Phone: 5414 Ken. [9989]



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A Lightweight T.T.

ONE effect of the success of a small two-stroke in the Victory Cup Trial will be a revision of opinion in some quarters concerning this type of machine. Before the war there was a certain hesitation about two-strokes, and the four-stroke seemed to be winning back its old favour. The splendid performance of the Cup winner and his colleague on the smallest engined machines in the trial (less than 200 c.c. capacity) proves that, under favourable conditions and at a set speed, a machine of this type can be regarded as a satisfactory solo motor cycle for ordinary, and even extraordinary, road conditions. That a difficult course of over 126 miles was covered on less than a gallon of petrol shows the economy of an efficient two-stroke, and is a point which, in these days of high-priced fuels, should go a long way further to popularise the lightweight.

In this type of machine we see the motor cycle for the million. Such a machine has many advantages for general utilitarian purposes; it has very few parts, and consequently needs little attention; it is light—as light as, if not lighter than the motor scooter—both points having great bearing upon the question of quantity production and reduction of cost.

For many years this journal has asserted that in the two-stroke engine lay the keynote of the lightweight, and *The Motor Cycle* has consistently encouraged this type of engine. Just before the war we recommended the A.C.U. to conduct a special trial for two-strokes, and, although our suggestion did not bear fruit, a trial exclusively confined to engines working on the two-stroke cycle may become an accomplished fact before very long.

A Cup Offered.

Also in 1914 we offered to the A.C.U. a silver challenge trophy for a separate class in the T.T. races for lightweight motor cycles limited to 250 c.c. capacity. We repeat that offer to the

governing body, as, undoubtedly, there is no better means to develop the small engine and light machine than the conditions imposed during a long run at speed over a T.T. course.

Because the small lightweight is the most suitable and most promising machine for "the million," a tertius class T.T. has a strong claim upon the governing body, and we appeal for the organising of this suggested class in the next T.T. Probably, in view of recent engine development, it might be found desirable to reduce the limit suggested in 1914 to 225 c.c., or even 200 c.c.

A Weight Limit.

As to whether a weight limit should be imposed is a matter for the A.C.U. to settle, should the committee accept our offer. Naturally, the small size of the engine automatically tends to induce designers to reduce the weight of the complete machine as much as possible; but it may be remembered that the average weight of the 1914 Junior T.T. machines which completed the course was over 200 lb., the heaviest being 234 lb., and the lightest 159 lb. True, tanks had a capacity for two gallons of petrol and a comparatively large quantity of oil; but, even allowing for these necessary extras, the weights were considerably higher than is desired for such machines.

The two lightweights which did so well in the Victory Cup Trial weighed about 1 cwt. For a 200 c.c., 225 c.c., or 250 c.c. class T.T., a limit in this neighbourhood might be found suitable.

We are convinced that the time is now ripe for more attention to be focussed upon the lightweight smaller than the Junior T.T. class, and that the A.C.U. might with advantage promote a race for machines between 200 c.c. and 250 c.c. capacity. We hope, therefore, that our offer of a trophy will be accepted, and that the 1920 A.C.U. programme for the Tourist Trophy races will include a class for genuine lightweights.

Occasional
Comments

What Trials do Not Tell.

AT this time of the year we are naturally bombarded by queries which boil down to "What machine shall I buy"? Enquirers often take four foolscap sheets to put the question. I notice a distinct change of tone in these letters since 1914. Many of the querists are concerned with information which a manufacturer's catalogue cannot give. The published results of trials cannot give it. I cannot give it, unless I have ridden the machine concerned far enough or recently enough to have received an indelible impression of its finer points. I am hunting about for a simple Saxon word to cover the subject matter of these queries, but I doubt if anything outside the French *nuance* will do. Briefly, the average buyer is now perfectly assured that any leading make of motor cycle will give him all the reliability, speed, and hill-climbing which he needs. On general grounds, he narrows his choice down to perhaps two or three machines by different makers, and then consults somebody whom he regards as an authority. His interest may concentrate on various details. Here are a few samples: steering, springing, silence, service, chain life, fuel and oil economy, detachability of wheels, top gear pulling, balance of engine at high speed, cleanliness in respect of oil and of mud, brake action and wear, loose nuts, carbonisation rate, valve-grinding period, accessibility, development of rattles, second-hand value, and the like. I think this list covers most of the finer points, the *nuances* which Philip Gibbs might describe as the "soul" of a motor bicycle.

The Parting of the Ways.

IN the past it was broadly taken for granted that all motor cycles were much of a muchness in these subtler aspects of quality. Machines were formerly differentiated chiefly by reliability, speed, climbing power, cost, and weight. On these five points the press, with the aid of competition results and manufacturers' advertising matter, could provide all requisite information. To-day fastidious and experienced riders admit another twenty points into their critical purview, and no man living can deal out facts on them all. A few leading journalists have tested most of the 1919-1920 experimental 'buses, but none of us have yet sampled—to quote one obvious example—the "service" of the many new firms who have already invaded the motor industry, nor do we know whether the old firms are going to offer service of the 1914 vintage, or change their familiar policies. Moreover, of the twenty odd new points in my list of desiderata above, there is not one on which a Six Days Trial of the pre-war type could throw very much light.

Three Deductions.

IN twelve months' time thousands of private owners will be in a position to give definite opinions on all these points in respect of the 1919-1920 models: and "reputation amongst owners" is, therefore, going to count far more heavily than ever it did as a factor in sales and output. A satisfied customer has always been the best advertisement, but customers in our particular industry are becoming super-critical, and they will never again be contented with some of the crude, coarse 'buses which sold freely enough in the old days. Fierce competition lies ahead, and makers will be compelled to listen more sympathetically to the public voice, as soon as the present famine of machines ends. Secondly, the prestige and value of the big trials will tend to decrease unless the organisers are clever enough to incorporate some test of these secondary qualities. Nobody thought a penny the less of the Rolls aero engine because Major Wood fell into the sea off Holyhead, and nobody would think less of the Triumph if their first string dropped out of the next Six Days within ten minutes of the start; nowadays we take reliability within limits for granted where first-class samples of established types are concerned. Thirdly, we need an independent testing laboratory, e.g., at Coventry, to which manufacturers could submit engines for an ordeal approximating to the Air Ministry fifty hour "acceptance" test of a new type of aero engine. A detailed report from such an institution would be more valuable to the manufacturer and more instructive to the public than a long string of gold medals won in road stunts of various kinds.

There would be no difficulty in organising such tests of engines and transmissions to-morrow with a clever man at the helm. I fancy comparative tests of comfort and springing might be devised. One great advantage of such an institute would be its power of curtailing the period during which the "form" of a machine becomes public. At present this period is lengthy. A new model is staged at Olympia in November. The public may buy at sight, and possibly burn their fingers. Or they may wait till after the T.T. (seven months later), or the Six Days (nine months later). They do not want to wait if the machine is sound. The manufacturer does not want to wait, with his capital locked up and earning next to nothing. The proposed testing institute could undertake tests in winter, and would be useful to makers, agents, and buyers. If certain firms shunned such a chance of publicity, we should know what conclusions to draw.

This year, however, many 1920 models will be entered in the Six Days event, and prospective buyers may judge their merits from the results

£1,000 A YEAR AT 26.*By GEORGE HENRY.*

WE were sitting in the club lounge after lunch the other day, and the talk had turned to the wonderful possibilities that modern Business offers the young man.

"The business world is simply crying out for men of mental energy," said Baines. "Any young man—and, for the matter of that, any young woman, too—who can bring an efficient mind to bear upon business problems is sure of a well-paid job to-day. There's a young chap sitting in the corner over there—d'ye see him? Doesn't look brilliant, does he? Just an ordinary personality—a young man of twenty-six. Looks keen in a quiet way, eh! Speak to him, and you'll find that his mind is alive. His brain begins a search for ideas before he gets his shaving water in the morning, and doesn't leave off before he closes his eyes to sleep—even then I'll wager there's some part of his mental apparatus at work.

"One firm alone pays that young chap £1,000 a year for giving ideas."

"And I've no doubt he's worth every penny of it," chimed in the managing director of a well-known manufacturing firm who was in the circle. "We've a young fellow very much in the same boat. He came to us in quite a minor position, something in the stock room. He hadn't been with us three months before he was in my room one day with a scheme for increasing output, worked out to the smallest detail. In six months he'd proved himself, and, frankly, I'd pay him double his present very liberal salary if he asked for it. I couldn't afford to lose his brain."

"Isn't it surprising that so few young men realise the opportunities that surround them?" mused Baines.

"It isn't surprising really," returned the managing director. "Education, or rather lack of education, is at the root of it. We are only just beginning to live down the evil effects of that shibboleth of the last generation—'My son, be contented with your lot.' Too many young men believe that brains are born, not made. They are content to accept the theory that genius is a gift from the gods. As a matter of fact, genius is just super-mental-efficiency. And any mind except a diseased mind can attain it. The most definite proof of the claim is this Pelmanism movement. Some of you are sceptical of Pelmanism; but let me tell you that Pelmanism has done more to bring men and women to a realisation of their powers and possibilities than any other educational factor.

"That young man I spoke of just now—I asked him once how it was that he, who on his own showing, had never aspired to more than a 'thirty-bob-a-week-job,' how it was that he became fired with enthusiasm for my business, how it came about that he gripped the details so well in so short a time, how he plucked up the courage to beard me in my own den. His answer came readily and simply. 'I discovered Myself—I underwent a course of Pelmanism.'

"If every young clerk and salesman did the same, if every young woman who is tapping typewriter keys followed his example there wouldn't be the dearth of £1,000 a year workers that exists to-day. There are managerial armchairs crying out for occupants, and crying in vain, because the people on the stools

in the general office don't trouble to send out an invitation card to Opportunity.

"And as for Opportunity—the opportunities in business to-day are endless. Given the efficient mind, the young people of mental energy, receptivity, creative thought, logical reasoning, and self-confidence can get anywhere. And, believe me, the quickest, the easiest, and the most certain way to get those qualities *in excelsis* is—'Pelmanise.'"

"Why are you so keen about Pelmanism?" asked Baines, as the circle broke up.

"Well, between ourselves," answered the managing director, "I'm a Pelmanist myself."

OVER 500,000 MEN AND WOMEN.

The Pelman Course has already been followed by over 500,000 men and women. *It is directed through the post, and is simple to follow.* It takes up very little time. It involves no hard study. It can be practised anywhere, in the home, in the office, in the train, in spare minutes during the day. And yet in quite a short time it has the effect of developing the mind, just as physical exercise develops the muscles, of increasing your personal efficiency, and thus doubling your all-round capacity and income-earning power.

THE MOST POPULAR BOOK.*By A LITERARY CRITIC.*

THE two most popular novelists in Britain are Nat Gould, who publishes four stories a year and is beloved by the British soldier in the ranks, and Victoria Cross, a million of whose books are said to have been sold during the war.

But, leaving out light fiction like the two classes mentioned, no author has such a wide public as the publicist who wrote "Mind and Memory." This volume has enjoyed the record circulation, in the last two decades, of over 3,000,000 copies. Not only have these copies been circulated—they *have been read*.

I had often read about "Mind and Memory," but I had never the book itself until I received one the other day from the Editor. I understand now how his mind must have been well Pelmanised before he could have crowded into thirty-two pages such a mass of interesting facts and figures, and before he could have made 3,000,000 people read a serious work.

Most serious books I have to criticise are verbose and over-written. Here is a writer who believes in his mission, and then has the organised brain to preach it tersely and without the waste of a word.

The case of Pelmanism is put down briefly and so convincingly that the 3,000,000 copies issued converted 500,000 readers into convinced and ardent Pelmanists. Never surely in the history of literature has a pamphlet or a treatise of any kind—or even such propagandist fiction as "Uncle Tom's Cabin" or "Law Down Your Arms"—had such an astounding result in comparison with the effort involved.

Take my advice: write for a free copy to:—The Pelman Institute, 199, Pelman House, Bloomsbury Street, London, W.C.1.

If you only want to learn how to write convincingly you will find in "Mind and Memory" a lesson for nothing.

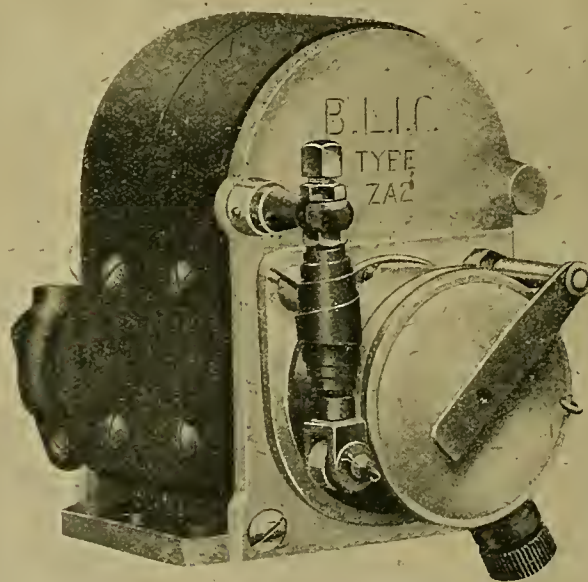
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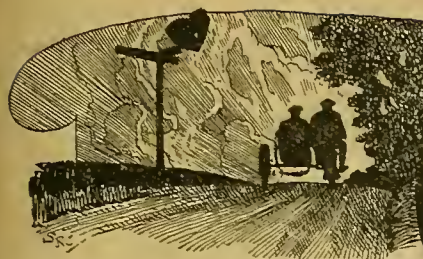
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THE LONDON-EDINBURGH RUN.

Some Reflections and Advice to Competitors.

It hardly seems possible that the most interesting and best attended of any closed motor cycle trials—the London-Edinburgh run—is actually to take place again after an enforced break of four years.

Previous runs seem almost like dreams, and I am sure even those of us who have competed in this classic event several times look upon this year's run almost as an innovation.

To me the event had become a sort of annual jaunt. I have competed no fewer than eight consecutive years, each succeeding ride seeming to be easier than the last, partly on account of the increased reliability of machines, and partly, I suppose, physical accommodation to the ordeal.

Physical Effects.

In some respects the run is more of a physical test than a test of the machine, and for this reason it must not be treated too lightly. It must be a great disappointment to fail; but, with intelligent foresight, and bar accidents, the coveted gold medal is a "snip."

It has been my practice to give a few hints and tips prior to each year's run—more for the reader who is tackling the event for the first time. I hope anything I write here may help to smooth the difficulties of the long run.

The worst mistake I ever made in this run—the first I rode, in 1907—was to drink a pint of beer with my lunch—and what a time I had from Newcastle to Berwick, for only by sheer force of will could I keep my eyes open, and twice I must have gone to sleep momentarily, to be awakened by my machine bumping on to the grass at the side of the road.

Several strong cups of tea, however, at Berwick kept me going to the finish. To my mind, beer—perhaps present-day beer is far less potent—is the worst possible drink on this run.

Keeping Awake.

If I have anything *en route* between official meal stops it is whiskey. Seriously, keeping awake is one of the points the novice has to study, and, paradoxically, a certain amount of trouble on the road is sometimes a blessing in disguise, inasmuch as it distracts one's mind from the monotony of reeling off mile after mile.

It is generally conceded that the worst section of the run is the first fifty miles or so after lunch. Edinburgh at this stage seems an interminable distance away in spite of well over half the distance having been covered, and until one reaches within twenty miles or so of Edinburgh the end seems as far off as ever.

But to get back to riding hints.

Lamps.

A good lamp, of course, is essential. I used two in 1910, 1911, and 1912, but the two years following only one, as lamps had so much improved. But I carried two generators as a safeguard. Ordinarily, only one refill of the generator is needed, and this is done at Biggleswade, forty odd miles from the start, where, though no time is allowed officially, all riders up to time stop and have a cup of coffee and a sandwich. Fortunately, this year these welcome necessities will again be available, though the food and drink question is not so easily solved for the real meals of the day.

Grantham is the first official stop (half an hour), and a welcome stop it is. The early starters find the day breaking during the last few miles in to Grantham, but the street lights are invariably on, and there is something uncanny, albeit fascinating, in running into this town in its stillness and quietness, except for an odd goods train snorting away at the back of the town.

Food and Warmth.

As regards food here, it is hoped to arrange for this to be provided, but up to the time of writing no definite arrangements have been made. I hope a good hot meal will be available, for one is ready for it at this time of the morning: it is very cold sometimes. I have known frost on the ground an hour out of Grantham.

This brings me to another point: Keep warm and, if necessary, shed some clothes at one of the stopping places later in the day. A wide, warm body belt is a boon, for, besides keeping one warm, it can be pulled up tightly, and the road shocks to the back considerably reduced. Personally, I found this the best tip I ever discovered for long-distance riding on a motor cycle. I hate to think of the possible state of the roads this year, which reminds me of another point. Always be on your guard for freshly laid and unrolled stones. I never remember a run without them, and have cause to remember them in 1908, when I croppered in the dark, a friend carrying my cap off my head with his footrest as he cavorted over the stones. It has not always been possible to get advice of these patches in time to warn riders at the start. They should be looked for between Hatfield and Stamford in particular.

Moderate Speeds.

A word of warning to those who find it difficult to ride at a moderate speed. The continuation of this classic run year after year has only been due to the

committee of the Motor Cycling Club making rules calculated to damp the speed propensities of the minority, who would otherwise ruin the event. The rule that any rider found fifteen or more minutes ahead of schedule time (which is based approximately on legal limit speed, viz., 20 m.p.h.) is disqualified is strictly enforced, and more than once a competitor has to his chagrin had to forego the coveted gold medal after a no-trouble run through. The last four events have been run most smoothly, the police rendering every assistance in guiding the riders, etc., and I exhort every rider to respect the amenities of the road and all speed limits when and where they may be found.

Hills.

In these days of improved mounts and variable gears, the hills encountered on the run are negligible to a well-tuned machine. It is not unusual to experience very hot weather, so overheating is a point to bear in mind.

Dust is another evil, both from the point of view of carburetter and one's eyes. Smoked glasses are a great relief on the interminable white road, and more especially if there is a strong sun.

Riding in Company.

Riding with another motor cyclist is to be commended: while jogging along at an even "twenty," conversation can be carried on, and the monotony relieved considerably. In past events this was only possible to entrants for the medals; the entrants for the special cups, since they did not know when or where they would be timed, had, perforce, to keep dead on time.

As no special awards are put up this year, any two riders starting within a few minutes of each other could ride together, the later starter of the two bearing in mind that his schedule time is later, and not be drawn into the mesh when running into one of the checks.

Setting Watches.

Finally, every entrant should set his watch to official time at the starting point, and compare his time at each checking place, in case a watch objects to the shaking it receives on the way. Route cards should be first given a coating of size. After this has dried, a coating of white varnish, when the cards will be waterproof. Fill in your own arrival and departure times at the various points before treating the cards, these times, of course, being based on your own particular starting time. This procedure saves mental calculations *en route*, which are a bugbear.

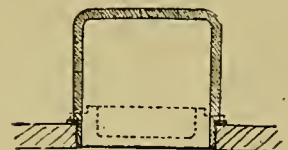
H. G. BELL.

Making The Best Of An Old Machine.

A FEW HINTS ON GEAR RATIOS, CARBURETTERS, AND LUBRICATION.

IT is not given to every sidecar enthusiast to possess a brand new outfit. A great many will have to make do with old machines for another year at least, and, apart from the difficulty of obtaining a new machine, we may always assume that the old machines outnumber the new. These lines, then, are written for the man with the old sidecar turnout.

In the text books of a few years ago we read that for sidecar work at least $3\frac{1}{2}$ h.p. is necessary and with a change-speed gear for hilly districts. At the present time, anyone owning even a modern three-speed machine does not need more than one short tour, fully loaded, away from his native heath, to become an ardent advocate of 6 to 8 h.p. for real sidecar work. But we have to



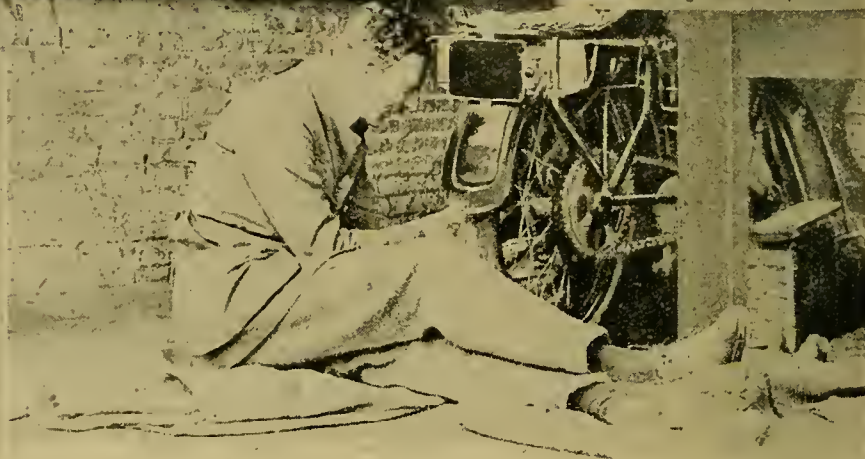
A standard $1\frac{1}{4}$ in. steel piping cap, screwed at the end to suit valve cap thread, gives approximately 32 c.c. extra compression space.

make the best of our old machine. It may be a Triumph, Bradbury, Humber, or Premier, fitted with a Roc, Albion, Millennium, or Bowden two-speed gear—and it pulls a sidecar.

Gear Ratios.

The value of a two-speed gear for sidecar work depends ultimately *ceteris paribus* on the value of its lower speed, because it is this gear which decides whether you can just scramble home up a long 1 in 9 or 1 in 10 rise without shedding your passenger or running alongside.

Of the various two-speed gears in use on old mounts, the N.S.U. gives the "highest" low gear. There is, as most readers know, a reduction of 50% from top to low,



or a rise of $33\frac{1}{3}\%$ from low to top. Thus, if the "top" ratio is 5 to 1, the low gear is $7\frac{1}{2}$ to 1. With an adjustable pulley a top gear of about $5\frac{1}{4}$ may be obtained, which gives the lowest possible gear of $7\frac{1}{8}$ to 1. This gear roughly approximates to the middle gear of a modern three-speed, and, though it would not be of much use in real hill-climbing with a sidecar, a great deal of useful work and pleasure can be obtained from a 4 h.p. machine fitted with such a gear, provided both engine and gear are in good condition.

First, with regard to the machine. It is, of course, essential that compression be good, wheel bearings correctly adjusted, and valves properly ground in. Also, unless the valve springs are known to be new, it will be advisable to fit new ones. Too often is this point neglected and the old ones deemed good enough; but in most cases it will be found that there is a marked difference with new springs fitted, and the experiment is well worth the very trivial amount which need be expended.

The exhaust valve lifter should be carefully examined and so adjusted that the valve seats properly when running. The writer has seen a 1912 machine which had developed exhaust valve trouble, and the cause was finally found to be that the primitive valve lifting arrangement prevented the valve from firmly seating. This only occurred when the engine was running on the road; which made the cause of the trouble rather difficult to locate.



The Stanley belt fastener sheaths are a saving to the belt on low gear work with an adjustable pulley.



Sectional diagram illustrating a worn valve guide.

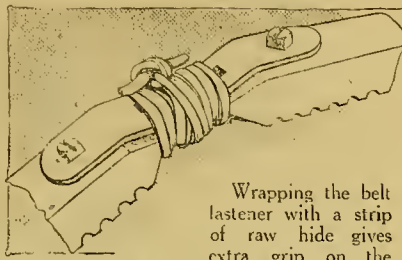
Making the Best of the Old Machine.—

In many cases, with an old machine, it will be necessary to give special attention to the carburetter and make experiments with different petrols, levels, and jets. If no spare jets are available, one may close up the one in use with a light hammer, and gradually increase the size with needles until the opening giving the best results is obtained. Carburation for sidecar work with an ageing single-cylinder is a very important matter. When a machine is used as a solo mount faulty carburetter setting is not so noticeable, but there is only one carburetter setting really suitable for the sidecar machine worked up to its maximum power, and only experiment can find this.

Air leakage at the inlet valve guide during the induction stroke not only makes starting difficult, but plays an important part in the running of the engine, especially when careful carburation is required as in hill-climbing or running slowly. One of the illustrations given here shows a simple method of overcoming leaks of this kind.

Next comes the important question of lubrication. As one is often called upon to give a good charge of oil to the engine at a second's notice, the hand pump, with which most pre-war machines are fitted, will probably be found difficult to improve upon.

It should always be remembered that it is better to over-lubricate than to use the oil pump sparingly.



Wrapping the belt fastener with a strip of raw hide gives extra grip on the pulley, and is specially useful with a variable pulley gear.

This, of course, is purely a question of judgment, but it may be taken as a good rule to give the engine a full charge before ascending a long hill. While "on the run," half charges every four miles may be more beneficial than a full charge every eight miles. A good quality oil should be used, as there is no economy in buying a cheap oil which inadequately lubricates the engine bearings.

The gear unit should be given attention by an occasional washing out with paraffin and recharging with the lubricating oil most suitable for the type of gear fitted.

As regards belt transmission, it will be advisable in the majority of cases to obtain the lowest top gear possible by means of the adjustable pulley, if such is fitted. It may be found that the belt "jumps" every time the fastener passes over the engine pulley. A Stanley fastener guard is a simple and effective remedy for this, or the fastener may be wrapped with a strip of raw hide, as shown in the

accompanying drawing.

The spokes in the back wheel should be examined, especially if the belt drum is anchored by means of clips to the spokes.

In conclusion, it may happen that, if an overloaded single is used on heavy spirit, it may be beneficial temporarily to lower the compression. A simple method of doing this is shown, a domed cap being in lieu of the ordinary exhaust valve cap. C.R.E.

Motor Cycles for Disabled Men.

LIEUTENANT G. B. HILLING, D.C.M. and Bar, 1st Wiltshire Reg., who is seen on his 6 h.p. A.J.S. and sidecar, was severely wounded in the right leg, which is permanently stiff, and he is unable to use it. He never rode a motor cycle before his injury, but thought that this means of locomotion would enable him to get over his disability and to enjoy touring in the country. The alteration was entrusted to Maude's Motor Mart, 100, Great Portland Street, London, W.1, who, we are glad to announce, are making a speciality of converting machines for the use of wounded soldiers. By means of extending the footrest



Lt. G. B. Hilling, D.C.M., and his A.J.S. outfit, the right footrest of which has been altered to enable him to ride in comfort, although unable to bend his knee.

and the fitting of a special footboard, shown in the illustration, Lt. Hilling is able to stand on the special footboard, work the kick-starter with his left leg, and then mount the machine. The right leg reposes on the special footboard and has no work to do, as all foot controls are arranged on the left-hand side of the machine.

Under such circumstances motor cycling is perfectly safe for people who unfortunately have not the full use of all their limbs; at the same time, it is not to be recommended that anyone so affected should make a practice of riding a solo machine, for their own sake.

Allon Two-stroke Improvements.

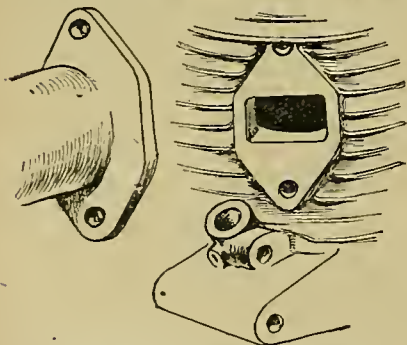
Detail Alterations to a Popular Lightweight.

IF evidence is wanted to prove that the two-stroke lightweight is as popular as ever the order files of the majority of two-stroke makers will supply all that is needed. Messrs. Alldays and Onions, for instance, have been obliged to refuse further orders for some time, as the demand was much in excess of the present output of their works at Fallows Road. They are not alone in this respect; many other manufacturers are "snowed under" with orders. Conditions are improving, and every week witnesses progress. Although there are many improvements in details which make for increased accessibility, the latest models are substantially the same as the former Allon production.

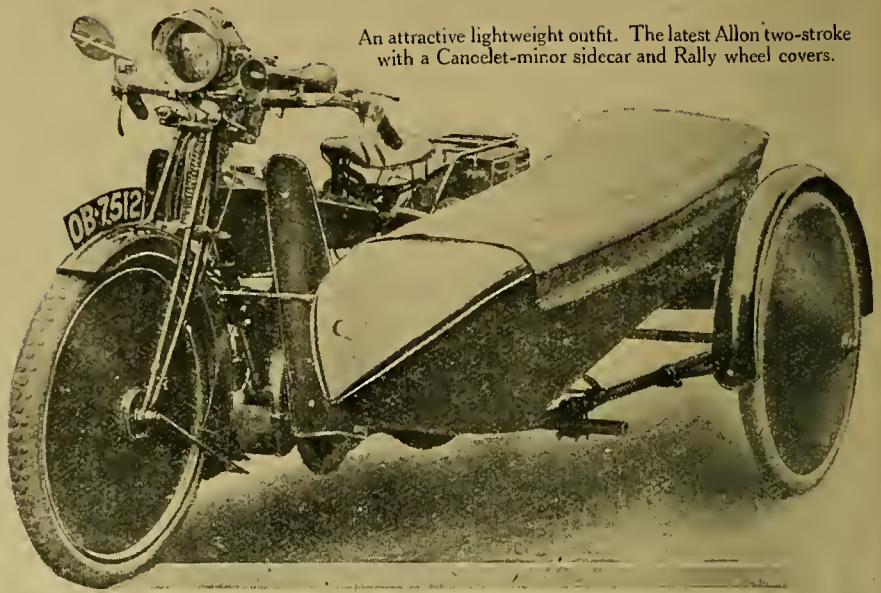
Unit Assembly.

The engine unit is now assembled and aligned complete with the gear box, magneto, and silencer on the bench, and the whole placed in the frame *en bloc*. When being decarbonised, the cylinder remains *in situ*, the crank case lower half is dropped, and with it the flywheel, shaft, connecting rod, and piston. The necessary scraping can be done through a large port in the head which carries the release valve dome. The exhaust port has been redesigned, and the pipe is now attached by bolts through two lugs on the pipe.

Frame and tank construction form the principal improvements. Messrs. Alldays claim to be the first to introduce the saddle tank, and all future Allon models will be fitted with a very smart double tank, saddled over the sloping top tube. A U-shaped pipe connects the two compartments at the rear. A sump and filter over the petrol tap is a good feature,



A new type of exhaust pipe connection which takes the place of a manifold cast on the cylinder.



An attractive lightweight outfit. The latest Allon two-stroke with a Canelet-minor sidecar and Rally wheel covers.

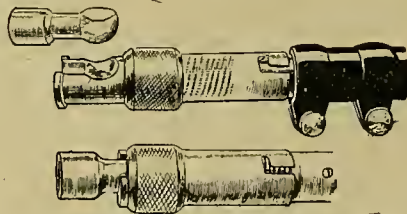
while the capacity is one and a half gallons of fuel and three pints of oil.

Efficient metal leg shields are now a standard fitting, also small aluminium covers over the front and rear hub band brakes.

A coil spring hidden in the magneto contact breaker cover enables the former vertical spring and cable stop to be dispensed with, and so gives better access to the sparking plug.

A Severe Test.

The model illustrated is a special order, and, although the makers do not intend this lightweight for use with a sidecar, it is quite capable of giving much good service within reasonable limits.



The Allon spring sidecar coupling. The bayonet fixing can be operated by hand with ease.

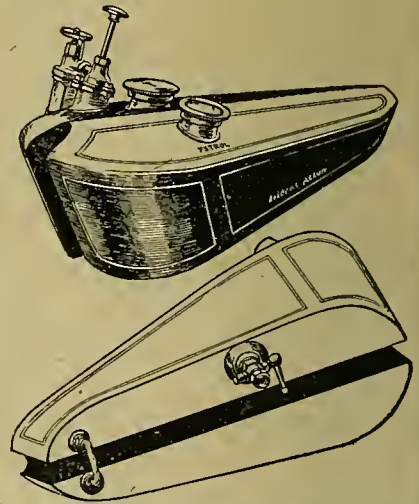
The Canelet-minor sidecar as fitted is probably one of the lightest attachments obtainable, but it cannot be termed roomy, and is only suitable for a small person. Nevertheless, a run of several miles in Birmingham traffic, and incidentally over tramlines and cobble paving in an atrocious condition, served to show its capabilities; although rider and

passenger were each about 11 stone, the second speed was very seldom needed.

Rally wheel covers are specially fitted to this machine, but these are not standard.

A lady's model also incorporates the saddle tank, and a belt guard.

The firm's recently patented sidecar lugs are now being made, and give promise of being an excellent fitting. The ease with which they can be manipulated will be the chief advantage; the possibility of detaching or attaching a sidecar by hand, without tools, is certain to appeal to sidecar owners.



Two views of the saddle tank of the Allon. Note the large filler caps, connecting pipe, and the sump over petrol tap.

BAD PETROL AND GOVERNMENT PROFITS.

IN reply to a question as to the profits the Government have made on petrol, it was stated in the House of Commons last week that the accounts between the importing companies and the Government have not yet been settled, but the prices had been fixed to balance as nearly as

possible to cost price after allowing for freight payment to the Ministry of Shipping. On January 31st, Government purchase ceased, and the petroleum companies have since been free to import on their own account, although restricted by lack of storage facilities.

Mr. Joynson-Hicks asked if the companies are allowed to sell decent petrol now, or are the Government insisting on getting rid of old stock and poor quality American petrol. The answer to the question was that the companies were allowed to sell newly imported petrol.

A SPORTING CLIMB.

Ascending Grindon in a Storm on
a 4 h.p. Douglas Sidecar with
Four Passengers.



The 4 h.p. Douglas ascending the steepest portion of Grindon Hill. Observe the state of the surface.

GRINDON Hill is not unknown to competitors in the A.C.U. Six Days' Trials. It has been the Waterloo of many a bold rider with its riverbed surface and steep gradients, coupled with its formidable S bend.

A few days ago, however, a party of Sheffield motor cyclists, mostly well-known riders, decided to settle for their own satisfaction whether the ascent was too steep and too rough for standard sidecar outfits.

They left Sheffield in beautiful sunny weather, and found grand going over the moors to Bakewell, but when dropping down into the village dark clouds gathered on the hills ahead. A distant rumble, along with a clammy atmosphere, warned them of an approaching storm.

Four up on a "4."

From the steep bank into Manifold Valley they got their first sight of Grindon Hill, arriving just as the sky grew dark.

It was decided to get the climb over as soon as possible, owing to the threatened storm. Lots were drawn for the first attempt at the ascent. J. Haslam started off with four up, including himself, riding a 1919 standard 4 h.p. Douglas combination.

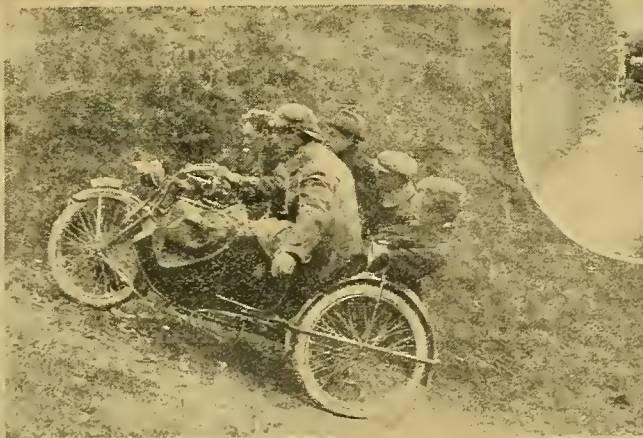
As Haslam set off, a great crash of thunder shook the valley, and before he had got to the first S bend, down came the rain. To describe it as rain does not do Nature justice. It was like the opening of some huge mill sluice. The driver and his passengers braved the elements, and scaled the hill in fine style, reaching the top before stopping.

Another Douglas rider followed, carrying three passengers (two in the sidecar), and, with the exception of a slight check on the second bend—through the blinding rain—he also made a clean ascent.

Grindon Hill is without shelter of any kind, so both riders and onlookers were soon wet to the skin, dust-coats not being found waterproof!

Haslam, having climbed the hill with his three passengers, was challenged to attempt the climb with four up, excluding himself. Notwithstanding the loose nature of the surface, and the heavy rain still falling, he again made a clean ascent. The load on one corner nearly pulled driver and machine into the wall, as the bend was taken slightly on the inner side, but the machine picked up well, and finished the rest of the climb with a rush across the roaring watersplash in the top field.

Haslam rode a standard Douglas 4 h.p. machine, and used his bottom gear ratio of 13 $\frac{3}{4}$ to 1.



(Left) To climb Grindon in a rainstorm with one passenger in the sidecar is a good performance, but to take five up under those conditions is a worthy achievement.
(Right) The Douglas pulling well on a steep portion of the hill.

A Selective Clutch Gear for Old Machines.

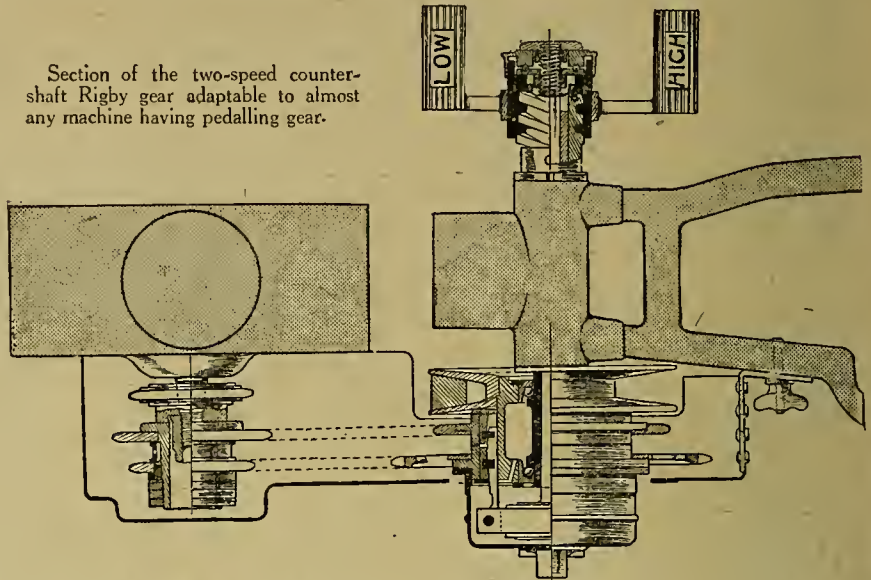
A Simple Gear Unit to take the Place of the Pedalling Gear of Old Pattern Machines.

UNDoubtedly the sidecar makes a stronger appeal to the average potential buyer than does a solo mount, and any device which helps to make a solo machine suitable for sidecar use is of particular interest at the present time when the demand for sidecar outfits exceeds the supply.

There are available a large number of single geared $3\frac{1}{2}$ h.p. singles, and twins a little larger, fitted with pedalling gear which would be more useful if they had a change-speed device. Two and three-speed hubs are not plentiful, and generally require several alterations to the frame before they can be fitted, but the Rigby gear illustrated has been designed to take the place of the pedalling gear, and with such a gear fitted a comparatively old machine can be brought up to date, with chain transmission and kick-starter, without a great deal of trouble; or, if desired, a chain-cum-belt transmission can be installed.

The engine-shaft is fitted with two sprockets mounted on an extension of the shaft and held thereon by means of a split spring washer and lock nuts, no keys being employed. The countershaft gear mechanism is carried in a shell which is eccentrically bored, and passing through which is the hollow main shaft. Through this hollow shaft runs a push rod, which is given a lateral motion by a double pedal, through which it is operated by means of a quick thread device. At the opposite end of the push rod there is a cross head mounted on two ball bearings attached to two thrust plates having inclined surfaces corresponding with similar faces in the inside of the phosphor bronze

Section of the two-speed countershaft Rigby gear adaptable to almost any machine having pedalling gear.

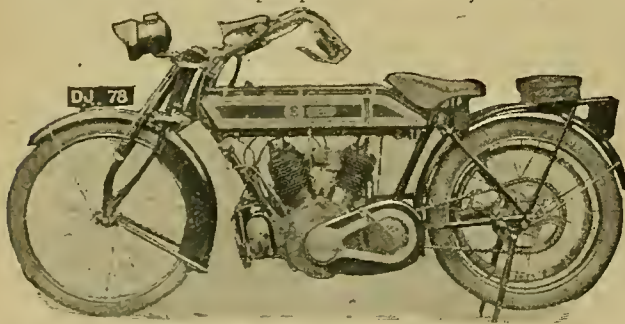


clutch drums lying outside the main shell, which is mounted on ball bearings. The drums are split in two places on their periphery, and, when not expanded, form bearings for the pair of large chain sprockets.

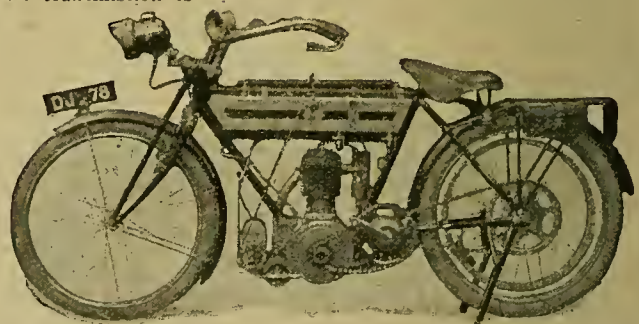
All the ball races are adjustable, and the working parts are enclosed in a dust-proof case. The conversion set includes double engine sprocket, chain sprocket and adapter for rear wheel chains, the countershaft gear and aluminium cover, or, where chain-cum-belt transmission is

required, with a pulley in place of the small sprocket for the final drive. The gear reduction is 50%.

This gear is specially suited for all Triumphs from 1906 previous to the countershaft model, Bradbury, Matchless, Premier, Rover, B.S.A., Rudge, Singer, and similar machines with pedalling gear. The gear is the patent of Mr. E. J. Rigby, of Prescott Road, St. Helens, Lancs., who is open to grant licences to one or more first-class manufacturers of motor cycles or units.



A Matchless twin, formerly single geared and belt driven, now a two-speed countershaft chain-driven mount.



An old pattern Triumph fitted with the Rigby two-speed gear conversion set.

READERS' ROAD REPORTS.

THE following is a selection of the reports received from readers on the state of the roads in various parts of the United Kingdom:

Shrewsbury to Sanderstead (Surrey) via Ironbridge, Bridgnorth, Kidderminster, Worcester, Tewkesbury, Cheltenham, Cirencester, Faringdon, Wantage, Reading, Sandhurst, Bagshot, Guildford, Dorking, Reigate, Purley: Rough to Ironbridge, fair to Bridgnorth, thence better to Worcester, good to Cheltenham, fair to Cirencester, fairly good to Reading (though rough in places), good to Bagshot and Guildford (avoid road via Ash), loose

stones in places to Reigate, good to Smitham, and then bumpy through Purley. Return route—South Croydon, Waddon, Sutton, Cheam, Ewell, Hook, Weybridge, Chertsey, Staines, Henley, Oxford, Chipping Norton, Evesham, Worcester, and then via Wenlock to Shrewsbury: Bumpy to Waddon, good to Cheam, slightly bumpy to Ewell, rough to Weybridge, fair to Staines, but loose stones in places and on to Maidenhead, thence good to Henley and Oxford (except last five miles), fair to Chipping Norton and Evesham, although bad ruts in places where timber haulage has taken place, fair to Worcester. Bridg-

north to Shrewsbury better via Wenlock than Ironbridge. Throughout the whole route there is a tendency in places to fill up pot-holes with loose stones and trust to the traffic to grind them in. The road Worcester - Stourbridge - Wolverhampton - Shrewsbury is fairly good.

The hill known as Black Forest Hill in Devon, from Starcross to Haldon, is "up" for miles at a stretch, and a Canadian lumber camp light railway takes up half the roadway. The alternative is to go via Kanton, which joins the hill about one-third of the way, where the surface is quite good.

WHEEL BEARINGS.

A Suggestion for Simpler Adjustment by Eliminating the Troublesome Lock-nuts.

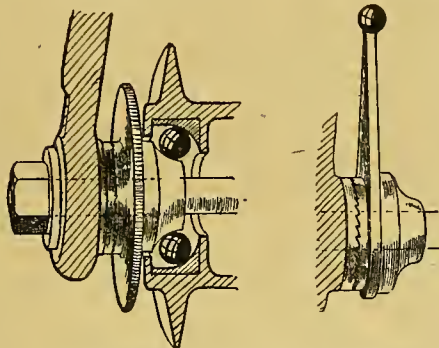
OFTEN have I sighed, not only for truly waterproof hubs, but for wheel cones that could be more simply and quickly adjusted. Lack of proper adjustment in this direction is one of the commonest neglects on the part of the everyday motor cyclist, especially when a sidecar is attached. The owner of the outfit, having packed his hubs with grease, proceeds cheerfully to forget all about them, and one day, finding one of his wheels a little loose, he decides to postpone till to-morrow the troublesome business of fishing out special keys to make the adjustment, and so forgets it again. In the meantime, mud and water get into the bearing, and when next his attention is drawn to it the damage is done, the cone unevenly worn, and so there is nothing for it but to fit new cones if the wheel is to be restored to its pristine order. I have examined a whole collection of machines at a second-hand store, and have found at least eighty per cent. of them badly out of adjustment as regards wheel bearings and steering heads, and so it is with the majority of machines on the road—simply because the ordinary novice avoids the ticklish business of tinkering with narrow, jammed-up, cone nuts.

Practically every rider in France discovered that wheel bearings were a prominent weakness in present-day design, while the present state of the roads in England, and the amount of stagnant water they carry, demands constant watchfulness, or wheel troubles soon crop up. When a sidecar is attached the front wheel of the motor cycle is the first offender, the sidecar wheel is a good second, and it is only a matter of time in the rear wheel, which, usually the sturdiest bearing of the three, develops a considerable headache in pursuit of the others. The sidecar acting as a stabiliser, the defect is not noticeable till considerably advanced, by which time, as already stated, the harm is done. I suggest that if wheel cones were more instantaneously adjustable, trouble in this direction would be less common.

A Suggested Simplification.

Wheel bearings could very easily be designed so that they could be adjusted simply by the application of the fingers, no keys being required other than

the standard wheel spindle key every rider carries. Personally, I should be very glad to see the last of thin cone lock nuts, requiring their special spanners—nuts with inadequate gripping surface, which have a knack of jamming, so that the slender jaws of the spanner soon yield to the labour of unjamming them. If they do not jam they are apt automatically to alter their adjustment, the wheel becomes a trifle slack, and so trouble is stored up for the future. I have known wheel bearings to become absolutely unadjustable to any nicety, owing to the constant attention they have required, and though it may appear that I am making the most of the alleged weakness it is, nevertheless, fairly clear that an improvement in design, eliminating the weaknesses referred to, would be a considerable step in the direction of perfection.



A suggested method of bearing adjustment recommended by the writer. A milled disc takes the place of a special spanner. A further step would be as shown on the right, a short lever fixed permanently to the cone.

Accompanying is a rough sketch of a design which would render the wheel bearings adjustable simply by turning the milled head of the cone after slackening off the spindle nut. The sketch does not intend to convey more than the idea for adjustment. The forks would be arranged to spring open sufficiently to permit the disengagement of the shallow locking ratchet, the slips between the notches of which would not be too great for fine adjustment. When the cone had been adjusted by the finger and thumb it would be held in the vice-like grip applied by the tightening of the spindle nut. There could be no doubt as to the permanency of

the adjustment, which could be done in a few seconds after loosening off the spindle nut. It will be seen that the adjustment disc cannot turn because it is ratcheted to the fork. The main body cannot turn because it is on the square spindle, which passes through a square hole in the fork.

The only objection one can think of to this arrangement is that there might be some wear, resulting in play in the thread of the cone, and on tightening up the spindle nut the wheel would be found a shade tighter than intended, but this could easily be allowed for in the setting, and, at any rate, occurs to some extent in present-day design. The adjustment cone would, of course, have to have a good long thread, as it would be called upon to bear the whole pressure applied by the tightening of the spindle. **CHINOOK.**

ANOTHER MIDLAND HALF-DAY TRIAL.

ON Saturday, the 31st inst., the South Birmingham M.C.C. will hold a half-day reliability trial over a sporting course of about sixty miles. There will be two classes, for machines above 300 c.c. and for those below 301 c.c. The club awards will be the Allday Cup (value sixty gns.) for the best performance of any rider, and the Joyce Shield for the best "amateur" performance. There will also be gold,

silver, and bronze medal awards to the first, second, and third in each class. A secret check will be taken, to be used only in case of a tie.

The start will be from the Mermaid Hotel, Sparkhill, at 2.30 p.m. Entries close on Saturday next. The event is open to members of the S.B. M.C.C. only, the trials secretary of which is Mr. E. Roberts, 26, Cumberland Street, Birmingham.

NORTON SIDECARS.

An Attachment in keeping with the Design of the Big 4.

NORTON MOTORS, LTD., do not believe in half measures. The reputation of their big single for power and reliability necessitates a sidecar in keeping with it, and with this object in view the firm are setting out to produce a most attractive outfit.

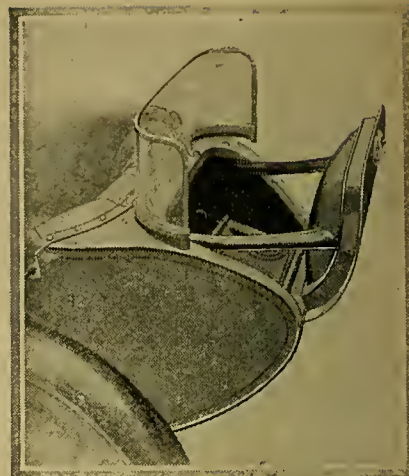
Formerly their sidecar chassis were built to their order, but they intend taking up this branch themselves. Mr. W. J. Hassell, the works manager, is responsible for the design, and he has been at some pains to ensure a frame and connec-

tions which shall form a suitable combination with the "Big 4" model.

The sloping front connection has a small lug which takes the end of the footboard supports, and this forms a triangulation which makes for considerable strength. The telescopic tube to the seat-pillar lug has three movements, and the rear axle attachment has two movements, so that the range of adjustment is unusual. One of the chief points is in the construction of the radial joints at front and rear. These allow a range of movement sufficient

for all purposes without sacrificing rigidity in the slightest degree. Springing follows the firm's former practice, and the body may be very easily detached from the front springs and lifted up out of the way, thus facilitating adjustments.

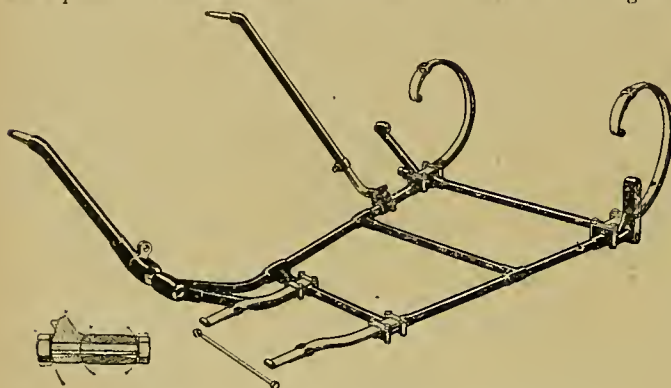
A type of Norton sidecar of which little



An innovation on new Norton sidecars is the fitting of a small screen for the child's dickey seat.

has been seen, although it has been made for several years, is the dickey seat model. In the rear locker is a folding seat fitted with an upholstered back, and on the latest model a detachable screen is fitted.

Production troubles are being cleared up, and Norton models, both machine and sidecar, should be coming through during the next month.



The newly-designed chassis to be used for the 1919 Norton sidecars.

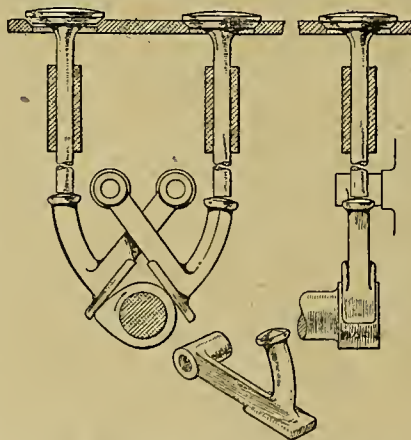
Valve Speed in Proportion to Piston Speed.

An American Valve Operating Mechanism aiming at Greater Engine Efficiency.

ALTHOUGH, at first sight, not extremely novel, the valve operating mechanism illustrated here is an attempt to obtain certain results which are not immediately apparent.

The aim of the invention is to assure the opening or closing of each valve at such a rate as to afford an area of valve opening in direct proportion to the speed of piston travel, with a view to maintaining a constant velocity of the inlet and exhaust gases, and thereby lessening the effect of gas inertia.

Piston velocity is higher at the inner end of the stroke than at an equal distance from the outer end, and reaches a maximum at a point in between the inner end dead centre and the mid-point of the stroke. This fact makes it advantageous to open the inlet valve and to close the exhaust valve quickly, as it is at the points mentioned that the piston exerts the greatest effect upon the mixture and exhaust gases. Thus, by correctly pro-



A valve gear designed to give valve opening and closing at a speed in proportion to piston speed.

portioning the length of the cam follower, it is feasible to maintain the area of valve opening in constant ratio to the velocity of piston travel during that period and to obtain a maximum valve opening at the time of maximum piston speed.

Mr. R. W. Phelps, of Rock Island, Ill., U.S.A., the patentee of the device illustrated, attains this end through a symmetrical cam operating both valves and imparting to one a quick closing and to the other a quick opening. The variation between rates of opening and closing of the valves is due to the varying radial distance from the point of contact between the cam face and the flat face of the follower to the pivot of the latter. The point of maximum valve lift may be advanced or retarded relative to the point of opening by varying the position of the pivot. With the more conventional form of valve gear this occurs midway between opening and closing, and rarely at the time of maximum piston speed.

MOTOR TAXATION AND THE ROADS.

THE following resolution was unanimously passed at a recent meeting of the Motor Legislation Committee:

"This Committee regrets that no assurance has been given by the Chancellor of the Exchequer that the proceeds of taxation upon motor vehicles and motor fuel shall revert to the purpose for which it was originally imposed.

"The increased taxation was accepted by the motoring organisations in 1909

on the understanding that the proceeds should be devoted to the Road Improvement Fund, and be administered by the Road Board. This revenue was diverted to the general purposes of the Exchequer in 1915 as a purely war emergency measure.

"This Committee desires to record its opinion that the restoration of the Road Improvement Fund from January 1st, 1919, alone affords highway authorities

the assurance of the financial resources to carry out the urgent work of road reconstruction and improvement necessary to meet the immediate requirements of all classes of road traffic; and, further, that until the Central Road Authority has secured an annual income, they will be unable to exercise their borrowing powers, by which alone sufficient funds can be raised to carry out at once a national scheme of road reconstruction."



Single-cylinder motor cycles on Glendoe during the Scottish Six Days Trials of 1914.

IT is a little difficult to define what one means by a "sporting" motor cycle. For some folk the mere externals of the machine fill the bill. Drop the handle-bars, remove the entrails of the silencer, wear a leather skull cap, with sausages over the ears, fit a speedometer dial graduated up to 80 m.p.h., and then you are a sportsman. For another type of mind it is enough to own a machine of a make which has figured largely in the archives of Brooklands and Manxland, and on occasions to ride it rather fast. For persons of a truly detestable kidney, the word need not mean more than to find Kingsway clear of traffic and free from police, to roar up it at forty with an open exhaust, making everybody stare, and then to shut down and creep winking into Holborn with the air of being "one of the boys."

The True Sportsman.

I offer a different interpretation, and present it by means of an illustration. In 1914 (?) the Rudge team for the Scottish Trials was entered with belt drive and a bottom gear of $6\frac{1}{2}$ to 1, as compared with the chain drives and 10-15 to 1 emergency ratios of most of their rivals. I do not know the inner history of this brave effort. Probably neither the firm nor the riders were aware of the calibre of the hills along the route. Had those hills been even moderately straight, the high-g geared Rudge would have stormed them at terrific speeds. But you cannot climb precipices on a high gear unless you can keep up your revs.; and you cannot keep up the revs. on a $6\frac{1}{2}$ gear round corners which represent a Cubist artist's impression of a true lover's knot. At the start the cognoscenti averred that the first big hill would behold the *débâcle* of the Rudge crowd. But they had not reckoned with the sportsmen in the Rudge saddles. I have admired many motor cycling deeds of derring-do, but I never

saw anything finer than the pluck and skill of some of the Rudge jocks. They swept up to those appalling corners—"blind" ones, in some cases—at crazy speeds. They "lay over" as far as their footrests would let them till their bicycles assumed the angle of a spun penny on the verge of collapse. They cut their engines out at the psychological second, wrenched the hurtling jigger round in a steep "bank," and slammed on full engine again. If they fell, as sometimes *had* to happen, they were up and running furiously to re-start on 1 in 5 goat tracks before any man could lift a finger. This was sporting work, jewelled and machine polished. *They were setting their mounts at fierce, dangerous, all but impossible feats.*

Now that a non-sporting mount costs £85 or so, many of us are being forced back upon the cheaper single-g geared solo machine. And why not? Tone down the Rudge picture a little, and what sort of riding contains more zest and thrill to the square millimetre? The 500 c.c. single-gear, belt-driven for preference, can be taken almost anywhere in Great Britain by the right sort of man. Major W. G. McMinnies, R.A.F., in the last Scottish Trial got a T.T. Triumph up the Kenmore side of Amulree in pouring rain. He stripped to his socks, so to speak, to do it, sending his kit on by train, but he did it. Main road hills in England and Wales are less formidable: a moderately good rider, in full touring kit, can wangle a T.T. single up nearly all of them if he knows his business, and it is just the spice of uncertainty that tickles one.

Having no gear box or free engine wherewith to camouflage indifferent tuning or clumsy driving, the sportsman must know his machine inside out. A new machine of this pattern will start in two yards; three months later it may need a lot of pushing about unless

The Sporting Single.—

the owner studies and pets it. Ham-fisted work with the controls reveals a rider's deficiencies: he tries to cross London from north to south or east to west on it, and spends a sweaty, weary couple of hours, conking out behind slowed taxis or seeking a cranny in the traffic big enough to give him vantage for a starting run. A month later his deft forefinger slides the throttle in quarter-millimetres, *tock—tock—tock* (very slowly, leaving room ahead), and then in quick time, *tockety, tockety, tockety*, as a gap opens and he nips through the block with never a dismount. When the surge of packed vehicles comes to a dead pause, he must stop with them: but, knowing his job by now, he is restarted on the decompressor before the 'busmen have let their clutch pedals up.

The Supreme Test.

If traffic is perhaps the supreme test of single-gear driving, hill work is certainly a very close second, even in England where real hills are far to seek. In the novitiate of sportsmanship a little mechanical assistance is possibly desirable. A Rudge-Multi or the simpler Zenith models or a Philipson pulley gives you a bottom gear which is higher than the second ratio of many countershaft boxes: and the non-sporting driver is usually forced down to first gear on Sutton. So a novice tackling our more difficult hills on such a machine is at least semi-sporting. But there is better fun to be had—from this special standpoint—in a *pukka* single-gear, without any reserve but maybe an adjustable pulley and a spare belt or a three-length fastener.

Years ago the late I. B. Hart-Davies and F. Hulbert used to go "prospecting for pimples" on single-gear Triumphs with adjustable pulleys, and "H.-D." told me shortly before the crash that killed him that flying was no better fun than these hill-jaunts. I have ridden many, many thousands of miles on tour and in trials, but 1911 stands out as my golden year. I rode a $3\frac{1}{2}$ h.p. Rudge with an N.S.U. gear giving a $5\frac{1}{2}$ to 1 gear, plus incalculable friction. It was always touch and go on the knuckle of a really bad hill; and that kept me fresh and interested, for quite a lot hinged on every feel of the carburetter levers.

A Thing of Pep and Life.

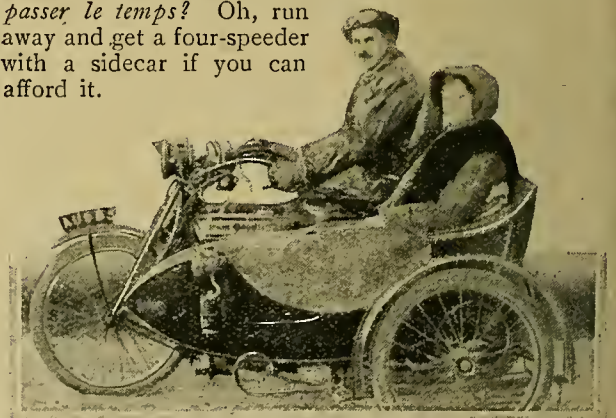
In between thick traffic and stunt hills the single-gear is the most charming mount on the roads, and to my mind no car can approach it, whilst the three-speeded tourist is dull and utilitarian by contrast. In the garage your single-gear T.T. belt-driven is as docile as a baby two-stroke—you can lead it about with a forefinger, or pick it up and dandle it. Outside the garage door you can heave it off without appreciable effort, whether the road be steep or flat. Get it running, and nothing short of a racing car has the same pep and life. It answers its spark and throttle as a live thing should. Its noise is clean—just the bark of the hot gases behind you, and the sharp clack of the tappets near your right knee—no confused smother of squeaks and rattles and growls from a hundred different stresses in as many frictional parts. And the *simplicity* of it! When the back tyre begins to thump, off with a couple of nuts and the wheel is adrift. If you keep a watchful eye on the belt in the garage, you need never touch it by the roadside, unless you venture among mountains in a

wet week. There is nothing else to go wrong, except the veneer of tune: and the sportsman enjoys tracing those lost 100 r.p.m., or the secret cause of a growing sulkiness in producing the first pop.

Since weight is a matter of account with these thoroughbreds of the road, the owner is protected from many inanities. Let the dud rider pack the panniers till they bulge: strap a flat case on the carrier, containing umpteen spare chains in grease-proof paper, a £2 case of magneto bits, and other absurdities; and finally ruin the set of his jacket and breeches by depositing further reserves of greasy iron-mongery in his pockets. What does the single-gear man carry? A Patchquick set. A 4in. King Dick. A knife. A belt-punch. Maybe a plug. A "plus sign" vest-pocket screwdriver. Not much more. Moreover, and for similar reasons, he is protected against one of the more ridiculous instincts of our fallen nature. I mean the "acquisitive" faculty by dint of which accessory dealers wax fat. Put the average motor cyclist down in front of the proper counter at Gamages, or Hunts, or Dunhills, with £5 in his pocket, and he will have to walk home in nine cases out of ten. His purse is the sole limit of what he will buy. Leather cases for belts and inner tubes and plugs and tyre kit. Mascots galore. Map cases. Watch cases. Containers for spare carbide. Weird alarms. Patent switches. Reverse mirrors. Badges. Muffs and gloves. Body belts. Goggles. Lubricators in amazing variety for every component of the machine. Tail lamps by the half-dozen. Densimeters. Voltmeters. Ampère meters. We all do it. I've done it. I shall do it again shortly. But you cannot insult the self-respect of a single-gear T.T. by bedecking it with these pretty toys.

Choosing a Wife!

The girl? Ah, there's the rub. When the hateful Percy comes along with a sprung wheel sidecar and electric dynamo and exhaust footwarmer and windscreen, you think he'll cut you out! Let him. It's a sound test. If she's after money and comfort and swank and soft cushions, let her go. It is not every girl who is worthy of a seat on the carrier of a fast T.T.: and those who are generally make good wives. But—just *pour passer le temps*? Oh, run away and get a four-speeder with a sidecar if you can afford it.



J. G. Poole, captain of the Nottingham and District M.C.C. Mr. Poole is the Nottingham representative of Messrs. Rudge-Whitworth, Ltd., and for years has been a keen supporter of the competitions held by this very live Midland club.

1,000,000 MOTOR CYCLISTS POSSIBLE.

The Scooter and the Question, Why Stand? A Case of a Fly in the Ointment.

THE sporting spirit which permeates the whole motor cycle movement was well exemplified by the complimentary dinner given to Mr. Frank S. Whitworth on Friday evening last at the Wheel Club, Birmingham. Mr. Whitworth is known to many of our readers as a competition expert, not only astride a motor cycle—he was usually seen on a Douglas—but also as an organiser, for he is a leading light in the Sutton Coldfield and Mid-Warwickshire A.C. For many years past Mr. Whitworth has held an important post with the Colmore Depôt, but is now commencing a new business under the title of F. S. Whitworth, Ltd., as agents for cars and motor cycles, and premises have been acquired in New Street, Birmingham. His former chief, Mr. E. C. Paskell, proprietor of the Colmore Depôt, was in the chair, and the gathering consisted of many motor cycle trade celebrities, from London and the Midlands, the North being represented by Mr. G. E. Rigby, of Manchester.

Beside the speakers there were present, among others, Messrs. Humphries and Dawes (O.K.), Mr. Cochrane (Best and Lloyd), Mr. Downes (New Imperial), Mr. Allday (B.S.A.), Mr. Eason (A.B.C.), Messrs. H. Smith, J. St. John, P. Mose-dale, H. R. Lane, R. H. Henderson, E. King, P. Olai (Amac), C. H. Gough, and J. Urry.

Naturally the great possibilities ahead of the motor cycle industry were the subject of constant reference by the different speakers. Mr. Paskell, in wishing Mr. Whitworth success in his new venture, stated his conviction that the market for motor cycles was in the neighbourhood of 1,000,000. The figure of

250,000 was given as the existing number of roadworthy motor cycles in this country, so that the extent of the promised expansion of the movement might be gauged. Later Mr. Granville Bradshaw, the designer of the A.B.C., who had driven from London on his Rolls-Royce, voiced the opinion that the motor scooter was not being regarded sufficiently seriously. He considered that that type of machine had a prosperous future, particularly among ladies, and especially those living on the outskirts of a town, for they would adopt the scooter in their thousands for shopping expeditions. At first he had somewhat scoffed at scooters, but he now readily acknowledged his mistake, and was quite enthusiastic as to their future. This conclusion, too, had been arrived at after experiments with an engine fitted to the front and rear wheel—he favoured the latter method—and after testing his latest scooter creation with 1½ cwt. of luggage. Here is a chance for the enterprising milk boy, paper boy, and messenger boy.

Mr. Alec Ross (Bowden's), in the course of an amusing speech, advised all his trade *confrères* to cultivate the press—as he had done—especially drew Mr. Bradshaw's attention to the dates of the Arbutnot Trophy Trial (July 4th and 5th) and the Six Days Trials (Sept. 15th to 20th)—reviewed what the specialised press had done for the industry—particularly on the sporting side—and pointed out the indispensability of that section of the press to the automobile movement.

Again, Why Stand?

Mr. Geoffrey Smith (Editor, *The Motor Cycle*), who responded, expressed appre-

ciation of the spirit of *camaraderie* evident that evening among men who were supposed to be trade competitors. He regarded the friendly feeling shown that evening to a new trade competitor indicative of the true spirit of the best types of sporting motor cyclists. Mr. Bradshaw had chided him for apparent lack of enthusiasm for scooters. He inclined to the opinion that the daily press enthusiasm would wane, and buyers would demand a seat to their scooters and other features of accepted motor cycle design, and thus we should arrive at the true lightweight motor bicycle, with which he was satisfied as it possessed a far wider range of action.

Mr. Bradshaw Tells a Tale.

During the evening an amusing incident occurred. Mr. Geo. Stevens (A.J.S.) seemed very troubled because Mr. Bradshaw, who arrived late, explained that he had experienced delays on the road, first, by a fly getting into the jet, and again by unbalanced steering, due to changing one of the front wheels, which necessitated a second stop to set matters right. Mr. Stevens, quite overcome with such a story, retired to a corner convinced that this was leg-pulling of the highest order. How could the fly have got into the jet, he pondered, surely that meant *via* funnel, petrol tank, feed pipes, gauges, etc. And who ever heard of steering being balanced during a fast road trip? Returning to the fray, Mr. Stevens and Mr. Bradshaw were several times seen arguing the matter out, evidently to the satisfaction of both, for they toured the A.J.S. works at Wolverhampton in company on Saturday morning.

THE M.C.C. LONDON-EDINBURGH RUN.

ENTRIES NOW NUMBER 114.

AT the time of going to press 114 entrants had been received for the London-Edinburgh run at Whitsuntide, which we give below:

SOLO MOTOR CYCLES.

W. Cooper (3 A.B.C.)
W. C. Hemy (2½ Metro-Tyler)
A. C. Robbins (2½ Wooler)
R. L. Williamson (4 Triumph)
Fred Notari (4 Triumph)
N. Rycroft (4 Triumph)
G. A. Reed (2½ Coulson B.)
E. M. P. Boileau (3 A.B.C.)
R. C. Boxer (4 Triumph)
J. T. Ross (4 Triumph)
P. W. Moffatt (spring frame 3½ Douglas)
A. Cocks (2½ Clyno)
T. H. Weaver (2½ Sirrah-Verns)
Tudor Thompson (2½ Douglas)
J. A. Watson-Bourne (4 Blackburne)
R. T. Leather (2½ Douglas)
H. E. Walker (2½ Hobart)
R. W. White (4 Triumph)
H. Le Vaack (3½ M.A.G.)
H. C. Nais (3½ Rudge Multi)
A. J. Sproston (3½ Lea-Francis)
W. R. Preston (3½ Sunbeam)
F. H. Ronsley (8 Zenith)
C. H. Hunt (3½ Zenith)
L. A. Baddeley (2½ Douglas)
Vivian Olsson (4 Douglas)
G. T. Udall (2½ Chater-Lea two-stroke)
G. F. Glen Kidston (3½ Sunbeam)
L. de Arango (7-9 Harley-Davidson)
W. G. Harrison (3½ Norton)
W. J. Lake (2½ Omega)
P. J. Enticknap (4 Blackburne)
P. Pike (2½ Lewis)
A. Hill (3½ Zenith)

H. R. Harveyson (6 Matchless)
P. T. C. Body (3½ Sunbeam)
H. Walker (2½ Lewis)
J. F. Hull (2½ Wooler)
J. A. W. Armstrong (3½ Lea-Francis)
A. M. C. Scott (5-6 James)
G. F. Ammon (2½ Metro-Tyler)
C. W. Addingley (3½ Humber)
J. E. Addingley (4½ B.S.A.)
J. Smithies (2½ Allon)
W. S. Jameson (6 A.J.S.)
H. Minton (3½ Sunbeam)
C. S. Baddeley (—)

PASSENGER MOTOR CYCLES.

J. Emerson (3 A.B.C. sc.)
J. S. Holroyd (8 Blackburne sc.)
Thompson-Thompson (4 Douglas sc.)
G. A. Bridgman (7 Indian sc.)
Rex Mundy (8 Matchless sc.)
James McKenzie (6 Humber sc.)
A. Mabon (4 Mabon sc.)
W. A. Fell-Smith (7 Harley-Davidson sc.)
J. Stevens (6 A.J.S. sc.)
R. C. Davis (8 Chater-Lea sc.)
J. Haslam (4 Douglas sc.)
F. D. Walker (4½ B.S.A. sc.)
J. L. Stocks (3½ Ariel sc.)
Gordon Fletcher (4 Douglas sc.)
H. H. Saddington (5-6 James sc.)
Hugh Gibson (8 Clyno sc.)
T. C. Delahay (3½ Sunbeam sc.)
W. B. Gibb (3½ Douglas sc.)
T. H. L. Witt (6 Enfield sc.)
E. G. Johnson (4 Douglas sc.)
John Godsal (8 Bat-Jap sc.)
W. P. Tippet (4 Rex sc.)
R. C. Osborne (7-9 Harley-Davidson sc.)
John Hilger (3½ Rover sc.)
A. J. Read (8 Sunbeam sc.)
F. E. Saehar (3½ Rudge sc.)
Leslie Pulham (3½ Ariel sc.)

F. H. Douglass (7-9 Harley-Davidson sc.)

E. Milton (5-6 A.J.S. sc.)
Kaye Don (8 Zenith sc.)
S. Julian (6 A.J.S. sc.)
F. Smith (8 Clyno sc.)
W. A. Jacobs (8 Rex sc.)
J. P. Le Grand (6 Rex sc.)
Frank White (6 Rex sc.)
A. G. Douglas Cleese (4 Norton sc.)
Sidney F. Garrett (8 Blackburne sc.)
W. H. Eggington (8 Sunbeam sc.)
S. Sawyer (4 Norton sc.)
F. T. Jonas (3½ Ariel sc.)
S. A. Applebee (7 Indian sc.)
E. Atkins (3½ Ariel sc.)
A. Carlton (7 Indian sc.)
S. J. Ellis (8 Matchless sc.)
R. Hoywill (6 A.J.S. sc.)
G. W. Wierkin (5 Brough sc.)
J. R. Lane (4 Douglas sc.)
T. B. G. Vale (8 Enfield sc.)
J. D. Campbell (6 A.J.S. sc.)
D. R. O'Donovan (4 Norton sc.)
G. Stevens (6 A.J.S. sc.)
J. Hargreaves (4 Norton sc.)

CYCLE CARS AND LIGHT CARS.

G. A. Nash (10 G.N.)
— Hay (10 G.N.)
G. G. Blakey (9.5 Hillman)
W. H. Oates (11.9 Lagonda)
G. C. Stead (10 A.C.)
T. H. Birch-Reymard (12 Clegg Darracq)
Y. Addis (10 Aston-Martin)
C. J. Myson (10 Singer)
A. Noble (10 A.C.)
G. W. Brownsort (10 A.C.)
K. A. McDonald (8 G.W.K.)
C. A. H. Mason (11.9 Morris-Cowley)
H. C. Vadis (10 A.C.)
A. J. Duncan (8 Duncan cycle car)
J. Van Hooydonk (11.9 Phoenix)



Times to Light Lamps.

SUMMER TIME.

May 22nd	...	...	9.21 p.m.
" 24th	...	...	9.25 "
" 26th	...	...	9.28 "
" 28th	...	...	9.30 "

Police Trap.

We learn that a police trap has been working over the week-end at Castelnaud, just past the bend and between the Boileau Arms and the Red Lion.

A.A. Glasgow Offices.

The Glasgow office of the A.A. is now at 23, Royal Exchange Square, Glasgow. The telephone number and the telegraphic address will be as heretofore.

Ten-mile Limit.

The police are very active on the Kew Road, from Kew Bridge to Richmond, at week-ends. Many motorists enjoying the opportunity afforded by the spring weather fall victims to the policemen's stop watches. A ten-mile speed limit begins near the end of this road, just on entering the town.

Government Petrol.

Mr. Kennedy Jones asked in the House last week whether the petrol sold to-day is all Government petrol, and in answer to that question it was stated that besides the Government petrol, of which there were large stocks when the war stopped, other petrol is now on the market.

A Panacea for all Ills.

A correspondent complaining of overheating of his engine enquires whether he had better submit it to an engineer for overhaul or fit a steel cylinder. There is something fascinating and wonderful about steel cylinders to the lay mind, but in this case a pair of new tyres would probably be as effective.

Cycle Cars in France.

The makers of the original cycle car, the Bedelia, 32, Rue Félicien-David, Paris, are placing two models on the market, a single-cylinder at £107, and a two-cylinder sold at £142. The single-cylinder model is complete with hood, screen, lighting, horn, and toolkit. Its engine is a 4 h.p., and the change of speed is by variable pulleys, allowing (so it is claimed) all hills to be climbed. The consumption is 88 m.p.g., and the average speed twenty miles an hour. The two-cylinder is a sporting type, petrol consumption 50 m.p.g., average speed 50 m.p.h., and it is claimed to climb hills at 30 m.p.h.

Additional Identification Marks.

In addition to the existing distinguishing index marks of various counties, the following identification letters have been assigned in addition: London County, LX; County Council of Lancaster, TB; Surrey, PB; Borough of Birmingham, OE; County Borough of Manchester, NB.

Huge Motor Scheme Successfully Launched.

The first share issue of the British Motor Trading Corporation, Ltd., the largest organisation of its kind in this country, with a capital of £2,000,000, has been over-subscribed. It shows that the public and the trade recognise the need for expansion and progress, without which we have but little chance of competing successfully for the colonial and foreign trade in motor vehicles.

The Institution of Automobile Engineers.

The programme for the next session of the Institution of Automobile Engineers appears to be interesting. Papers have already been secured from Mr. Ricardo, Dr. Aitchison, Dr. Ormandy, Mr. W. M. Hackett, and others. Among the subjects to be dealt with will be engine design, valve failures, volatile fuels, production of steel tubes, producer gas for vehicles, cast iron for use in automobile construction, etc., while it is hoped to obtain an important paper on American practice.

It is intended to hold a special session of the Institution during the period of the Olympia Show, which will be

Special Features.

MAKING THE BEST OF AN OLD MACHINE.

THE SPORTING SINGLE.

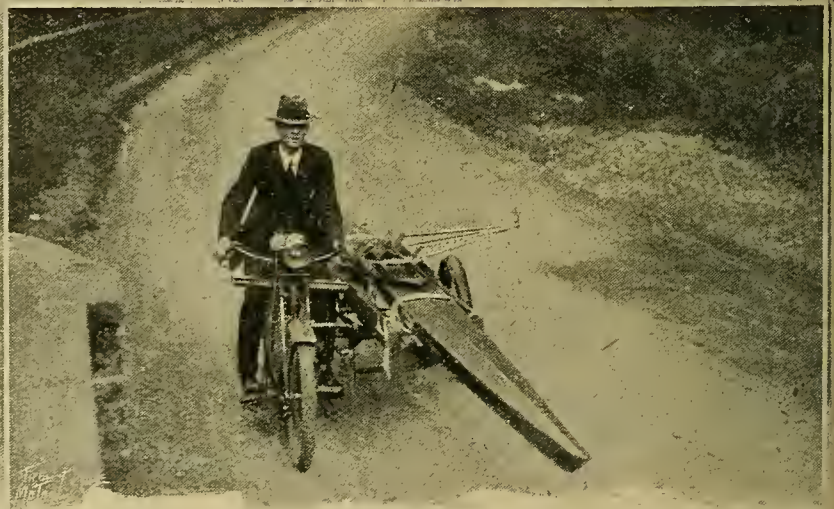
THE LONDON-EDINBURGH RUN.

arranged in such a way as to give members an opportunity of meeting the president and council.

A useful feature of the next session will consist in the reading of the papers not only in London, but in the various provincial centres in which a demand appears to exist, and where the subjects of the papers are connected with local industries.

How Long Will it Last?

The other day we set out for London on a 1914 3½ h.p. Humber and sidecar with Armstrong three-speed gear. The engine and gear were in good condition, but the sidecar was shabby, and the machine by no means a new one. We made a good run to the county town, six miles away, where, noticing that the lubricator was not working, we stopped at a garage kept by a well-known motor cycle rider to have it cleared. While attention was being paid to it, we mentioned the fact that we were taking the machine up to London to be sold, and stated that the price was £50. After a short trial run by the proprietor, the money was paid and we completed the journey by train.



The sidecar chassis put to good use by a sculling enthusiast who uses it for taking his skiff down to the water.



Major Dixon-Spain, the newly-appointed assistant secretary of the A.C.U.

The A.C.U. Six Days Trial.

It has been practically decided that the venue of the Six Days trial this year will be Llandrindod Wells, and the dates from September 15th to 20th.

The London-Edinburgh Run.

The M.C.C. is greatly in need of voluntary helpers at the Grantham check, at which the first competitor is due at 2.58 on the morning of Saturday, June 7th. Those willing to assist should communicate with Sec.-Lt. W. Cooper, R.A.S.C., M.T., Clayton, Suffolk.

The Arbutnot Trophy.

The rules and regulations for the Arbutnot trophy event are nearly complete, and will be announced shortly. It will be in the nature of a two days' trial on July 4th and 5th, and will be open to officers and ex-officers of the Royal Navy. The start and finish will be at Plymouth, and the winner will be found by sending the competitors up a certain test-hill. On each day the first ascent will be at a slow speed, and the second at a high speed. The competitor whose average difference is greatest will be accounted the winner, the test being one of consistent running throughout.

Petrol Reduced—Good News for Motor Cyclists.

On Monday last, the 19th inst., reduced charges for fuel were announced by the Shell Marketing Co., Ltd., as follows:

	Per gallon.
Shell motor spirit	... 2s. 8d.
Flag motor spirit	... 2s. 6d.
Crown motor spirit	... 2s. 6d.
Benzole motor spirit	... 2s. 4d.

The reduction was not altogether unexpected by our readers, as, in the issue of the 8th inst., the following paragraph appeared:

"This month motor cyclists may confidently expect a tardy, though none the less welcome, reduction in the price of petrol."

Levis Cup Trial.

As the premier award in the Sutton Coldfield A.C. trial last Saturday was presented by Mr. W. H. Butterfield, managing director of the firm making Levis motor cycles, no Levis machines were entered by riders connected with the firm.

The R.A.E.M.C.C.

A motor cycle club has been founded in connection with the Royal Aircraft Establishment at South Farnborough, and has a membership of approximately 100. The first run will be to the Hut Hotel, Wisley, on Sunday afternoon, June 1st. The secretary is Mr. T. P. Mears, O9 Department, Royal Aircraft Establishment, South Farnborough.

The 1919 N.U.T.

The N.U.T. Co. is moving into larger works, but preparations for the output of the 1919 model are now well in hand. The new machine, which has been subjected to several thousand miles testing, is fitted with a $3\frac{1}{2}$ h.p. V twin, made exclusively for the N.U.T. by the J.A.P. Co. from the design of Mr. Hugh Mason. The cylinders are 64.5 mm. x 76 mm., and the machine is intended for solo use only. Chain-cum belt transmission, with a Sturmey-Archer gear box, is adopted, the chain being entirely enclosed in an aluminium case. With 26in. x 2 $\frac{1}{2}$ in. Palmer Cord tyres, the saddle height is 29in.

Coventry and Warwickshire Motor Club.

The Club Competition for the Manville Cup, a trophy valued fifty guineas, presented by Mr. Edward Manville, M.P., president of the club, will be held on Saturday next, May 24th. The starting and finishing point is Davenport Road, Coventry, and the trial will be held over a route of just over eighty-one miles. The event will be non-stop, except for

the tea interval of one hour at the top of Edge Hill. A starting and stopping test will be made on Sunrising. Thirty-six entries have been obtained, which are sub-divided into the following classes:

MOTOR CYCLES.—Up to 350 c.c. Up to 550 c.c. Up to 1,000 c.c.

SIDECARS.—Single cylinders. Multi cylinders.

CARS.—Up to 1,500 c.c. Over 1,500 c.c.

Motor Cycles for Discharged Soldiers.

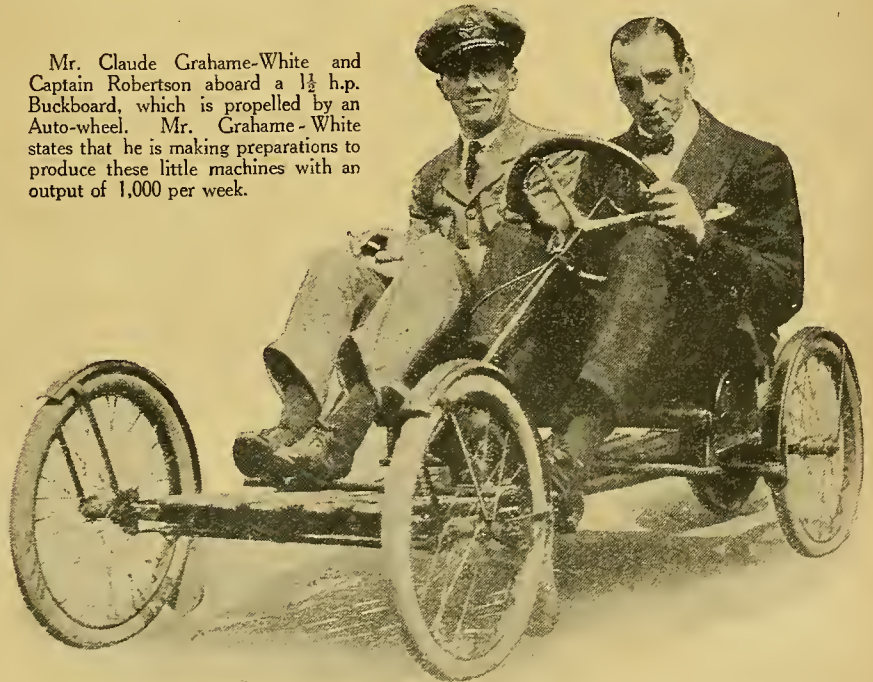
It has been known for a long time that we have been in sympathy with any scheme which would enable discharged soldiers to purchase surplus Government motor cycles at a reasonable figure. The A.C.U. is also in sympathy, and has been in communication with the Surplus Government Property Disposal Board with a view to persuading them to adopt some scheme which would enable ex-D.R.'s and other discharged soldiers either to purchase their old machines or other Government motor cycles at a reasonable price.

The Disposal Board has replied to the effect that it has not been found possible to grant preferential treatment to ex-service men, and that the object of the Board is to sell at the highest possible price so as to relieve the tax-payer.

To a letter from a correspondent who recently approached the Controller on this subject, a reply was made to the effect that the Department is prepared to sell motor bicycles by private treaty at full market price to any approved organisation interested in the welfare of discharged soldiers, which is willing to undertake the responsibility for disposing of such vehicles to ex-service men on a scheme of deferred payments.

This sounds very nice, but, unfortunately, no such organisation exists so far as we know, which will undertake the business of buying motor bicycles and selling them on the deferred payment system.

Mr. Claude Grahame-White and Captain Robertson aboard a $1\frac{1}{2}$ h.p. Buckboard, which is propelled by an Auto-wheel. Mr. Grahame-White states that he is making preparations to produce these little machines with an output of 1,000 per week.



BIRMINGHAM-LLANGOLLEN AND BACK.

Week-end Touring Trial of the Birmingham M.C.C. 34 Survivors of the 41 Competitors.



Over forty members of the Birmingham M.C.C. started in the club's two days' trial to Llangollen and back last week-end. A scene at the start.

FORTY-ONE competitors started in the above trial on Saturday afternoon, and thirty-four of them had arrived back at the finishing point near Streety at 9.10 the following evening.

Starting from Duke's Garage, Birchfield Road, at 2.30 p.m., the competitors were guided by route cards via time checks at the Bradford Arms, Shrewsbury, and Llangollen, a distance of 75½ miles.

After breakfast on Sunday morning several competitors, in company with the Liverpool contingent who assisted in the checking, tried their luck on Altj Bady, the local *pièce de résistance*. There were more failures than successes, as may be imagined in view of its precipitous nature.

G. Kuhn, on his Victory Levis, and A. G. Bostock on a 2½ h.p. A.J.S., made clean ascents, and Kershaw (2½ h.p. New Imperial) got up with foot assistance. These were the only successful soloists, whilst sidecar honours fell to Rex Mundy, who, with Lt. H. R. Davies, had ridden up to Llangollen during the night, after competing in Saturday's Levis cup event.

The return trip, which measured 80½ miles, included two observed hills. The leader left at 3 p.m. on Sunday, the remainder following at minute intervals. Harley Bank, Wenlock, and Jockey Bank, Ironbridge, were no real test of the machines.

The weather was fine throughout, ren-

dering the dust rather trying, and, as usual, punctures were frequent. One or two finished with flat tyres.

The survivors of the trial and the machines they rode are as follows:

G. Kuhn (Levis)
E. H. Weaver (Venus)
E. R. Troward (Metro-Tylor)
B. Kershaw (2½ New Imperial)
P. S. Taylor (New Imperial)
W. A. Bown (Bown-Villiers)
L. Newey (3½ Ariel sc.)
C. Oerton (—)
W. E. Emery (Rudge Multi sc.)
M. G. Silver (Quadrant)
F. T. Hill (twin James sc.)
W. C. Treen (James sc.)
T. F. Watson (Norton)
W. H. Edwards (6 twin James sc.)
A. H. Edwards (James)
E. Kibble (Triumph)
E. Danks (James sc.)
H. P. Cutler (Norton sc.)
J. Allday (4¼ single-gear James)
S. Rodway (twin A.J.S. sc.)
L. Baker (B.S.A. sc.)
T. Pollock (twin James sc.)
G. R. Morgan (Triumph sc.)
H. H. Saddington (James)
C. L. Whitley (Triumph)
A. Woodfield (Clyno sc.)
H. J. Stretton Ward (Triumph)
J. F. Lidstone (twin James)
G. H. Dalby (Triumph)
H. Phillips (twin James sc.)
B. L. Bird (B.S.A. sc.)
E. Sherriff (James sc.)
R. W. Vaughan (7 Harley-Davidson sc.)
L. Clarke (twin James sc.)

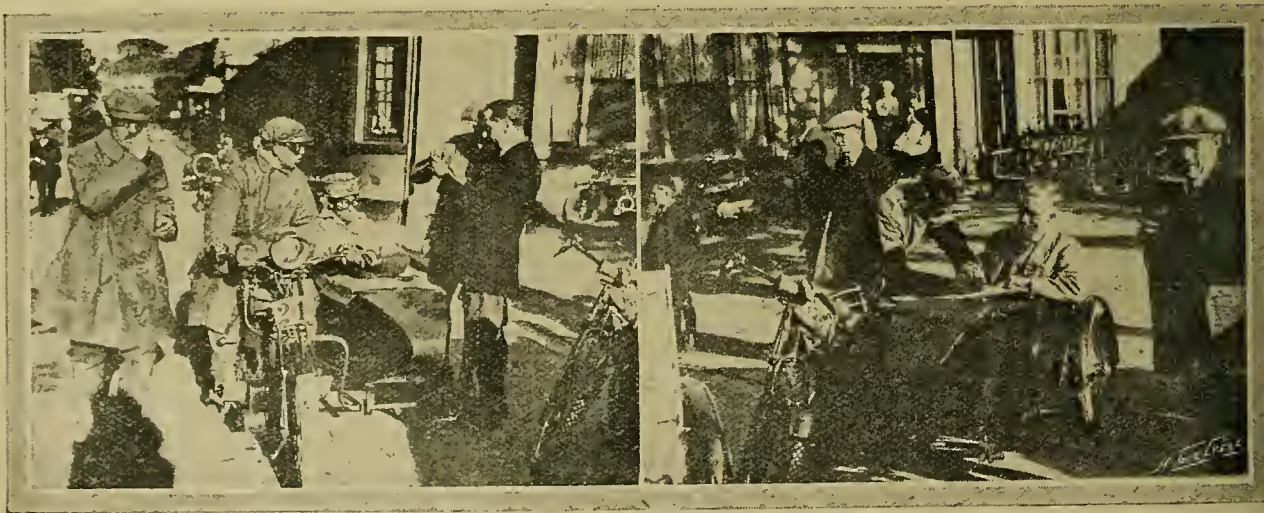
Observations.

Lt. Treen, R.A.F., rode from Brown-hills with a flat front tyre. Nothing to what he has gone through as an observer, for he wore three wound stripes and several decorations.

W. H. Edwards, who rode one of the new big twin James sidecar outfits, carried a passenger on the carrier throughout.

P. S. Taylor, thanks to his spring frame New Imperial, was able to finish the last ten miles on a flat back tyre. He was thus able to keep on time throughout.

J. Allday had out for the first time a 4¼ h.p. single-gear James, found no difficulty in climbing the hills; and was delighted with the smoothness of the all belt drive.



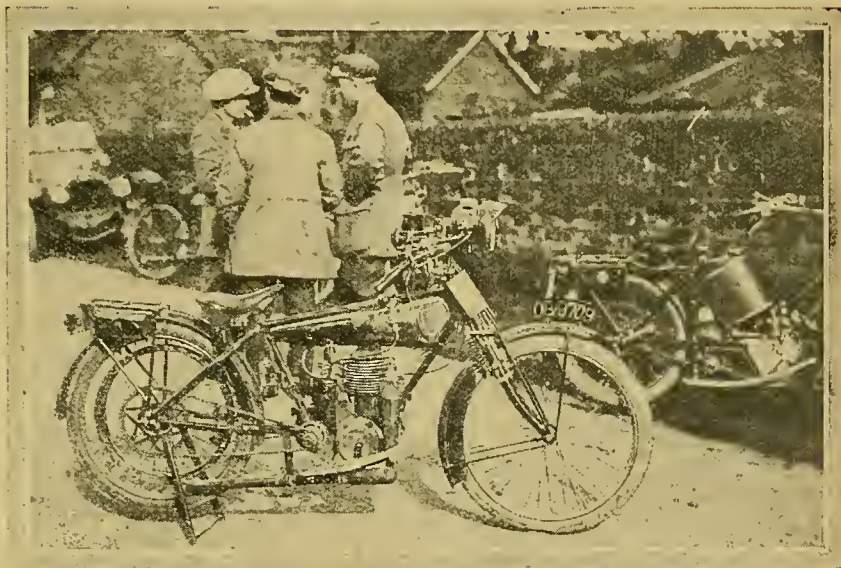
Scenes during the Birmingham M.C.C. Two Days Trial. (Left) Cutler (Norton) timing in at Llangollen. (Right) A rider of a Quadrant (with Mr. T. Silver as passenger) signing at the finish of first day's run

THE LEVIS CUP TRIAL.

Sutton Coldfield A.C. holds Sporting Half-day Event.

THE Sutton Coldfield and Mid-Warwickshire Automobile Club usually opens the competition "season" with the Colmore Cup trial, which, before the war, probably attracted more entrants than any reliability trial organised by a motor cycle club. This year, however, the manufacturers were not ready for a Colmore Cup trial in February or March—and perhaps the Sutton Coldfield Club was not ready to organise it—so to mark the opening of activities, they held an opening half-day trial over a thirty-seven miles course, which proved to be a sporting event. There were two observed hills—both in the same non-stop section—and the two features of the trial were route finding and speed judging.

The course was not marked in any way, neither did the route cards mention any place by name nor give any distances. Competitors did not know whether the course was forty or sixty miles. They were provided with a direction card which they had to follow at 18½ m.p.h., and speedometers were barred; so, altogether,



The machine on which H. Greaves won the Levis Cup—a Calthorpe fitted with the new 350 c.c. Precision two-stroke engine.

the Levis Works, Stechford, including the following well-known competition riders: T. Stevens (James), W. L. Guy (Scott), the last winner of the Levis Cup, F. A. Watson (Sunbeam), Rex Mundy (Matchless), H. Greaves (Calthorpe-Precision), H. O. Wood, the Scott T.T. winner, and A. Milner (Diamond).

The following are the awards:

1.—LEVIS CUP AND GOLD MEDAL.

H. Greaves (350 c.c. Calthorpe-Precision two-stroke). Time error of 1m. 7½s.

2.—CLUB GOLD MEDAL.

A. Milner (2½ Diamond-Jap). Time error of 1m. 15½s.

3.—CLUB SILVER MEDAL.

Seymour Smith (2¼ Ivy two-stroke). Time error of 2m. 28½s.

SILVER SOUVENIR PRIZES.

H. R. Lane (4¼ B.S.A.), A. W. Thrush (4 Triumph), T. Stevens (4¼ James sc.), R. E. Walker (2½ Excelsior), W. L. Guy (3¼ Scott), B. H. Norris (4¼ B.S.A. sc.), F. A. Watson (3½ Sunbeam sc.), J. N. Roberts (2¼ Douglas), P. G. Dallison (3¼ Ivy-Precision), S. W. Sparkes (3½ Rudge Multi), Rex Mundy (7 Matchless sc.), and H. J. Edwards-Cox (4¼ Sunbeam sc.)

RETIRED.

F. R. Hovard (2½ Allon) and H. O. Wood (3¼ Scott).

The greatest time error was 17m. 13½s. Rex Mundy was fourth with 3m. 1½s.



The winner of the Levis Cup, H. Greaves (Calthorpe-Precision), ascending the observed hill.

to the competitors, it was a most sporting event, and by no means could the speed judging be termed speed guessing, since they had to average the speed mentioned over the whole of the course.

Although rough and in narrow lanes, the observed hills were not sufficiently severe to eliminate any of the competitors. In fact, every starter except two finished without loss of marks.

The gradient of the most severe hill may be judged by the fact that the lightweights only resorted to their second gears on the rough portion near the top, and the 3½ h.p. sidecars successfully negotiated the ascent on middle gear.

Mr. W. Hughes Butterfield, the donor of the cup, organised the trial, and eighteen competitors were sent off from



Scene after the finish of the Levis Cup Trial on Saturday.



Woolwich, Plumstead, and District M.C.

The Matchless Cup trial has been postponed owing to unavoidable circumstances and will be held later in the year.

Ballymena and District M.C.C.

Competitions arranged by this club include speed-judging, reliability, and petrol consumption trials, with possibly a hill-climb. Social runs round interesting parts of the country are also included.

Bristol M.C.C.

A special general meeting was held recently at the Grand Hotel, Bristol, when many new members were elected. Capt. Philip Grout was elected captain of the club, and a working committee of ten was also elected. It was decided to hold a tourist competition (for members only) at Whitsuntide to Land's End, competitors starting from Bristol on Whit-Saturday and returning on Whit-Monday.

Wolverhampton M.C.C.

The reliability trial held on the 10th inst. over a route comprising Bridgnorth, Farlow, Whitley, Stourport, and Kidderminster resulted as follows:

- 1 (Corke Silver Cup and gold medal), H. J. Stretton Ward (4 Triumph).
- 2 (silver medal), A. J. Stevens (6 A.J.S. three-wheeler).
- 3 (bronze medal), Lt. A. Milner (2½ Diamond).

New Glasgow Club.

A social club for Glasgow motor cyclists has been suggested for some time, and such a club has now been formed under the title of "The Garage Club." Club rooms have been opened by Messrs. Bell Bros., at 250, Great Western Road, who have also undertaken to fit up and decorate the premises.

It was proposed to run social and competitive fixtures. The following office bearers were elected: President, Mr. Wm. Simpson; vice-president, Mr. J. Barclay; captain, Mr. J. Connel; vice-captain, Mr. R. Runnell; hon. secretary, Mr. J. Robinson; treasurer, Mr. H. Macdonald; committee, Messrs. D. S. Anderson, N. Laurence, J. Bell, J. Mackie, and E. N. White.

Taunton and District M.C.C.

After four years of enforced suspension this old club was resuscitated at a general meeting held at headquarters—Clarke's Hotel—on Friday last. There was a good attendance of members, and everything points to a most successful season.

Col. Dennis F. Boles, M.P., was again elected president, a position he has held since the club's formation. Mr. W. G. Potter was re-elected captain. Mr. H. T. Kite deputy captain, Mr. W. E. Maynard treasurer, and Mr. Stuart Goodman, Little Court, Taunton, hon. secretary.

The opening run is to Sidmouth on Thursday, 29th May, leaving headquarters at 2 p.m.

Future Events.

- May 24.—Coventry and Warwickshire M.C. Manville Cup Trial.
 May 24.—Birmingham M.C.C. Social Run.
 May 24.—Glasgow M.C.C. Hill-climb.
 May 24.—Oldham and District M.C. Reliability Trial, Heyden Bridge.
 May 24.—Sheffield and Hallamshire M.C.C. Competition for Dickenson and Darwen Cup.
 May 24.—N.M.C.F.U., Leeds. Run to Dunsforth.
 May 24.—Exeter and District M.C.C. Opening Run.
 May 25.—Eastern Counties M.C. Run to Newlands Corner.
 May 25.—Ilkeston and District M.C.C. Run to Quorn.
 May 25.—Liverpool M.C. Social Run to Blackpool.
 May 25.—North Derbyshire M.C.C. Run to Edwinstowe.
 May 25.—Rochester, Chatham, and District M.C. Run to Margate.
 May 25.—S. Birmingham M.C.C. Run to Bromyard.
 May 25.—N.M.C.F.U., Sheffield. Run to Glossop.
 May 25.—Manchester M.C. Reliability Trial.
 May 25.—Wolverhampton M.C. Run to Holt Fleet.
 May 25.—Widnes M.C.C. Run to Rugh.
 May 25.—Ballymena and District M.C.C. Benzole Consumption Trial.
 May 25.—N.M.C.F.U., Leeds. Picnic Run to Nunmonkton.
 May 28.—York and District M.C. Run to Bolton Abbey.
 May 29.—Taunton and District M.C.C. Opening Run to Sidmouth.
 May 31.—N.M.C.F.U., Sheffield. Run to Edwinstowe.
 June 1.—S. Birmingham M.C.C. Reliability Trial.
 June 1.—Harrowgate and District M.C. Reliability Trial.
 June 6.—Essex Motor Club. Midnight Ride to Yarmouth.
 June 6.—M.C.C. London-Edinburgh Run.
 June 7.—Birmingham M.C.C. Trial to Land's End.
 June 9.—Cork and District M.C.C. Twenty-hour Reliability Trial.
 June 9.—Liverpool M.C. Open Reliability Trial.
 June 25.—Essex Motor Club. Speed Trials at Southend.
 June 28.—Midland C. and A.C. Reliability Trial.
 September.—A.C.U. Six Days Reliability Trials.

Worcester and District M.C.C.

It has been proposed by a few motor cyclists in this district to form a club in Worcester. All interested in the pastime are invited to attend a meeting for that purpose at the Grandstand Hotel, Worcester, to-morrow, Friday, the 23rd, at 7.30 p.m., or to communicate with Mr. C. E. Tysoe, 38, Droitwich Road, Worcester.

Glasgow M.C.C.

This club will hold a hill-climb at Inverberg on Saturday next, at which there will be five classes. (1) under 350 c.c., (2) 350-600 c.c., (3) exceeding 600 c.c., (4) sidecars under 600 c.c., and (5) sidecars exceeding 600 c.c. A prize will be awarded to the winner in each class (provided there are six entries). The hon. secretary of the club is Mr. W. J. Turpin, 26, Wilson Street, Glasgow.

Swinton and District M.C.C.

This club, which was formed with the earnest desire of fostering the pastime of motor cycling in the Swinton district by promoting social outings and club sports competitions, has developed with encouraging rapidity. The president is Viscount Mountmorres, Vicar of Swinton.

A copy of the rules, together with the programme of runs, can be obtained on application to the hon. sec., Mr. L. H. Harris, 15, Kersal Avenue, Pendlebury.

Ripon M.C.C.

The Ripon Motor Cycle Club has been restarted. A general meeting was held in Ripon recently at which fourteen new members were elected. The hon. secretary of the club is Mr. James Douglas.

Stalybridge and District M.C.C.

A motor cycle club has been formed for motor cyclists residing in Stalybridge and the surrounding districts, the object of which is to promote social runs and competitions. Local motor cyclists should communicate with Mr. T. H. Mills, Wood Lea, Stalybridge.

Hartlepool M.C.

The Hartlepool M.C. is making a strong appeal to motor cyclists and car owners to join the club, and has issued a compelling circular which details the advantages of so doing. Motor cyclists in the Hartlepool district should write for a copy of this to the hon. secretary, Mr. W. T. Walton, jun., 21, Scarborough Street, Hartlepool.

Scarborough and District M.C.

An effort is being made to revive the Scarborough and District Motor Club, and motor cyclists or car owners in the district are invited to communicate with either Mr. John D. Fell, 57, Gladstone Street, Scarborough, or Capt. H. L. Waddington, R.A.F., 51, Valley Road, Scarborough.

North Birmingham M.C.

The committee will meet shortly to discuss future competitions and social runs. The first event, probably, will be a reliability trial for the silver cup presented by the distributors of Shell motor spirit. Prospective members of this club are invited to communicate with the hon. secretary, Mr. A. W. Thrush, 34, Reservoir Road, Erdington.

Sid Vale M.C. and L.C.C.

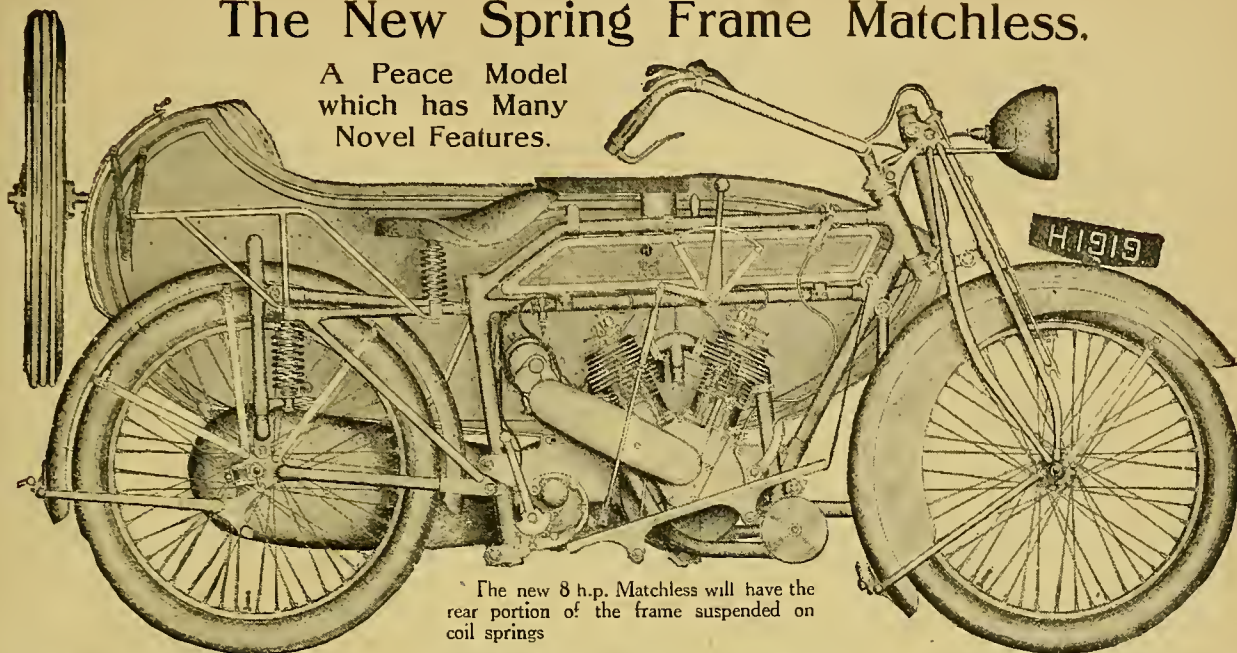
There was a good response to the invitation sent out to motor cyclists to start a motor club in Sidmouth. About twenty met at the Y.M.C.A. rooms. Councillor J. Lashbrook was unanimously elected chairman, Mr. Owen Ford secretary, and Mr. Thomanson, Lloyds Bank, treasurer, with the following as a committee: Rev. —, Griffiths, Messrs. Pickson, Martin, Arnold, Wilson, Oliver, and Mortimer.

Sale and Altrincham M.C.

A new club for the southern suburbs of Manchester has just been formed under the above title. The club subscription is 10s. 6d. for motor cyclists and 15s. for car members. The officers elected are all well-known and enthusiastic motorists, and a strong committee has been formed. Those desirous of joining who use the Cheshire roads should apply to the hon. secretary, Mr. F. Stanley Booth, Holme Lea, Mornington Road, Sale, or the assistant hon. secretary, Mr. J. T. Ward, Arran Avenue, Sale.

The New Spring Frame Matchless.

A Peace Model
which has Many
Novel Features.



The new 8 h.p. Matchless will have the rear portion of the frame suspended on coil springs

SINCE early in 1915 Messrs. H. Collier and Sons have been experimenting with spring frames for motor cycles, and no doubt, but for the war, a spring frame Matchless would have been offered to the public in 1916. In 1915 we described a flat twin Matchless which embodied a spring frame with coil springs, and the new Model H, as the Peace model is called, has a springing device which is a modified design of that fitted to the flat twin, and gives an excep-

tionally large movement to the rear wheel. As will be seen from the accompanying illustration, the springing system differs in many respects from others embodying coil springs, which are carried at the outer corners of two triangular members rigid with the frame. The wheel fork is pivoted at its inner end, and a substantial loop passes vertically over the wheel, having at its lower end lugs for carrying the springs.

We shall shortly describe this new

model more fully; in the meantime it suffices to say that the design embodies more features not apparent from the photograph. One of these is an ingenious arrangement of linking both driving and sidcar wheels. This synchronises the movements of both wheels, and prevents the driving wheel from leaning when turning corners.

Other features include an automatic exhaust valve lifter connected to the starting pedal, and interchangeable wheels.

THE GRAHAME-WHITE SALE.

AMONGST the various lots offered for sale last week by the Grahame-White Aviation Co., Ltd., were several motor cycles. A Royal Enfield sidcar was purchased for £125, and was only exceeded in price by a brand new 8 h.p. New Imperial-Jap sidcar outfit, which was sold for £145.

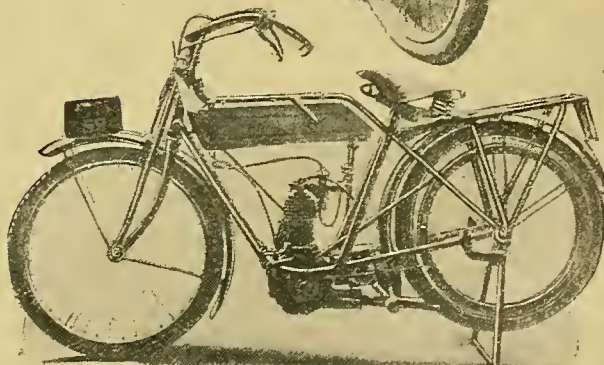
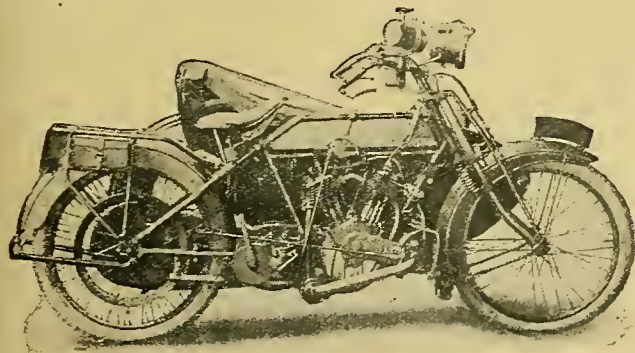
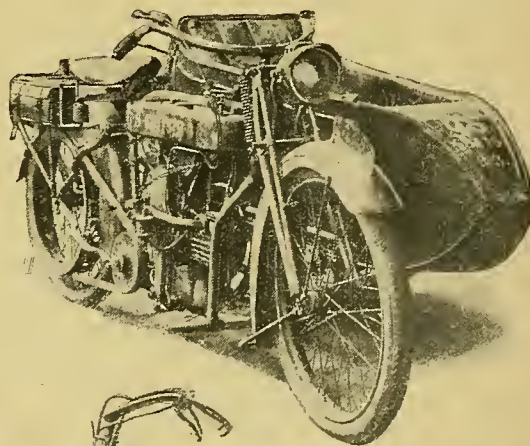
A 4 h.p. Douglas sidcar outfit (Army pattern) was knocked down for £104.

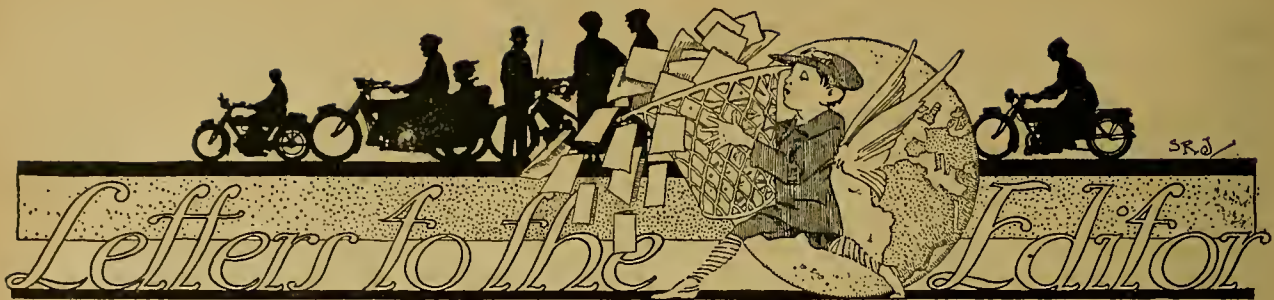
With the exception of a 1912 $3\frac{1}{2}$ h.p. Humber motor cycle and Chater-Lea cane sidcar, which realised £55, the remaining machines were solo mounts. Of these a $2\frac{1}{2}$ h.p. Rex fetched £16 and a 1911 $2\frac{3}{4}$ h.p. Kerry went for £15.

(Top) A 4 h.p. Douglas
sold for £90.

(Left) £145 was the price
paid for this New Imperial
outfit, which was quite new.

(Right) This $2\frac{1}{2}$ h.p. Rex,
of very early date, realised
£16.





The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

BENZOLE AND TANKS.

Sir,—As many readers, like myself, are using benzole, they will find that, by giving their tanks a coat of Shellac varnish (obtained at almost any oil and colour merchant), the benzole will not soften or affect the enamel in any way. It is a spirit varnish, dries quickly, and with a bright, hard finish. My tank has been treated with it for over four months and is still in perfect condition.

King's Heath.

EXCELSIOR.

AUCTION SALE OF CANADIAN MOTOR CYCLES.

Sir,—We have noticed that, not only the catalogue, but the press, states that the Indian motor cycles sold at the British Motor Cab Co.'s Depot, Brixton Road, on the 5th inst., were 1916 models. This is an error. The machines in question were 1914-15 models, and entirely different from the 1916 Powerpius.

We should appreciate it very much if you would give publicity to this letter, as we consider it is only right that purchasers of these machines should know exactly what models they have purchased.

HENDEE MANUFACTURING CO.,
W. H. WELLS, Manager.

THE LYCETT TROPHY.

Sir,—Although the Birmingham M.C.C. has issued preliminary regulations for the Lycett Trophy, which have been published in your valuable paper, the committee has been continually up against the usual stumbling-block when a premier award is up for competition, namely, finding the winner which will eliminate the element of luck. Although rather late, a special meeting was called to go thoroughly into the matter, and, after much discussion, in which all the suggestions put forward had their weak points, it was decided to award the Lycett Trophy as follows:

The Lycett Trophy will be awarded to the competitor who makes a perfect performance. That is, not more than two minutes early or late at each time check and climbs the observed hill. If more than one competitor qualifies, they will be bracketed equal trophy winners and each awarded a silver replica in miniature of the Lycett Trophy. Although this does not actually pick out the winner, I think you will agree it is a move in the right direction, as it gives to each who has made an equal performance an equal award, as all those who are within the four minutes margin are considered to have made an equal performance on time.

W. H. EGGINTON, Hon. Sec.

NORTH WALES ROADS.

Sir,—I read with interest in *The Motor Cycle* of May 1st suggestions as to a route to North Wales. I happen to have just completed the journey myself. My route was Slough, Maidenhead, Henley-on-Thames, Oxford, Woodstock, Chip-ping Norton, Evesham, Worcester, Kidderminster, Bridg-north, Much Wenlock, Shrewsbury, Llangollen, Corwen, Bala, and Dolgelly. I spent one night at Oxford with some friends. I avoided all big centres such as Birmingham, and met with nothing big in the way of hills. The roads round Hounslow are bad, but otherwise I found them good; there is another bad bit before reaching Shrewsbury. In Shrewsbury, on signalling for a turn to the right, in order to follow the pointer "to Holyhead," I was made to go straight on by the police. There was no other pointer, so I took the first turn to the right down a narrow back street which landed me out at the bridge on the north side of the town.

I think the pointer where the policeman would not let me go might quite well be removed to this street. Between Llangollen and Corwen there was one bad piece of unrolled stones. I took the valley road from Corwen to Bala, which was good. The roads in Merioneth are in a shocking condition owing to much traction traffic in log hauling. Very little seems to be done to mend them beyond throwing down large stones. The Dolgelly-Festiniog road in particular should be avoided.

C. T. A. BEEVOR.

SINGLE-SPEED AND FOUR CYLINDERS.

Sir,—There has been a lot said recently *re* the single-speed "big single" as a sporting 'bus, but very little has been said about the four-cylinder single-speed machine.

The single must always be the simplest and most reliable type of engine, but the 5-6 h.p. F.N. and the 7-9 h.p. Henderson have both proved to be reliable machines if properly looked after.

The following is my ideal specification:

FRAME.—Sprung front and rear *à la* Indian.

ENGINE.—Four-cylinder 7-9 h.p., o.h.v., air-cooled.

TANK.—Wide at the front, tapering to the rear, to hold two and a quarter gallons of petrol and half a gallon of oil.

LUBRICATION.—Drip feed with auxiliary hand pump.

CARBURETTER.—Two-lever variable jet.

TRANSMISSION, ETC.—Shaft drive. Combined lighting and ignition generator, behind the engine, close to the tank. Semi-T.T. handle-bars with Pedley grips.

A machine such as this would satisfy any ordinary desire for speed, and would be easy to manage in traffic, as when the engine is warm a slight push will start it, and if all is in order it will fire regularly at 3 m.p.h.

FOUR CYLINDERS.

REPAIR JOBS.

Sir,—*"Ixon"* is quite right in what he says, but the trouble, again, is that firms require the cash first, and do not always fulfil their contracts. This has happened to me twice. What is to be done then? Also they do not keep anywhere near the time stated, which is a great annoyance.

On the other hand, I had the following repairs to my engine (a 1916 J.A.P. 5 h.p. twin): Completely dismantled and cleaned, rebored crank case and fitted special bush, connecting rods straightened, new baffles, rockers hardened and ground, two new gudgeon pin bushes, big end bush, crank pin, two spindles, cone for gear and balls, inlet pipe nut, piston and rings and gudgeon pin, piston ring valve cap and washer, three valve guides, four valve springs, odd washers and bolts, valves ground in, and whole engine assembled with a new cylinder.

Spare parts	...	...	...	£4 12 3
Plus 45%	...	...	...	2 1 2
Labour	...	...	...	3 6 0

Total £9 19 5

What could be more reasonable, and, moreover, it was done to time. Also, now I have had some dealings with the firm, they do not hold up spare parts for the cash, but despatch them promptly.

I should wish here to thank Zenith Motors for the way they treat their customers.

Should other readers be willing, I should like to give and hear of the firms who do not give satisfaction, and see their names printed in your paper.

G.B.A.

A GOOD CLIMBER.

Sir,—The performance of my "Big Four" Norton is, I think, worthy of the notice of your readers.

With a Norton coachbuilt sidecar, myself and passenger (each weighing fourteen stone), petrol and spares, it climbed the well-known Porlock Hill, near Minehead, without any effort or stunt riding. This outfit is just an ordinary standard "Big Four" single-cylinder Norton, and can pass heavy twins quite easily.

I have used this combination for four years, and am still running on the original Dunlop heavy tread 26×3 oversize tyres—an excellent feature of the Norton outfits.

I should like also to say that the Norton people have always been courteous and prompt in despatching spares.

Bedminster, Bristol.

B.J.

AN EXTRA SPARK.

Sir,—The cause of a peculiar firing back into the carburettor of my brother's machine baffled us for many days, and as we thought the matter rather strange, I have written to you so that perhaps some other motor cyclists might benefit from the explanation.

Much intermittent firing after one big pop in the carburettor made us think that premature ignition was caused, and we were led to believe that the Bosch magneto was giving two sparks. This turned out to be the case. The contact breaker casing was worn rather on the end boss of the magneto. So much so, that the points of the breaker varied in distance apart as they moved round. This was due to the eccentricity of the casing and the contact breaker, which caused the points to touch again and break a second time towards the end of the cam piece, thus causing a second spark at the plug points and somewhere near the beginning of the suction stroke. Hence the explosion when the valve was open and the intermittent firing.

A new contact breaker casing and end plate put matters right immediately. The trouble may not be new to you, but it struck us all as being most novel.

P. BOWLEY.

AVERAGE SPEEDS.

Sir,—Just to show that it is possible for a girl motor cyclist to be interested in another part of motor cycling besides the clothes to be worn, may I comment on the letter from Mr. Stuart in the April 24th issue?

I was pleased to see something sensible written on the subject of averages. I did not see Mr. Varney's letter, but the idea of his two-stroke averaging 35 m.p.h. with a sidecar and 45 m.p.h. without puts my head in a whirl. I have ridden a Lewis and an Allon, and always thought they were doing well if they touched 35 m.p.h. solo. I should have called 20-25 a good average on a long run.

I have what I consider an excellent 2½ h.p. Douglas, Colonial model, and have never done more than 46 m.p.h. on the level. My best average was from Bromley to Birchington (seventy miles odd) at 27 m.p.h. exactly. To do this I was riding at 35 m.p.h. most of the way, and for several stretches of good road at 38 m.p.h. I only beat this run by five minutes a week later on a 4½ h.p. Bat, which seems to show that, taking cross roads and villages into consideration, one cannot comfortably, in the interests of one's own safety and that of other people, do much more than average 27 m.p.h. I have a Bonniksen speedometer.

I read your paper with interest, as I am a very keen, though ignorant, motor cyclist.

(Miss) E. MANVELL.

GUESSING COMPETITIONS.

Sir,—To determine reliability by speed guessing is nothing short of ridiculous, and may, at some time or other, open the way to fraudulent practice in order to obtain the premier award.

In the Victory Cup trial there were many riders who qualified for the guessing competition, i.e., secured highest possible marks for reliability, but their mounts were in effect designated less reliable than those fortunately placed machines whose drivers had the good luck to estimate speed more closely. The result is that there can be no real pride of ownership, because possession signifies nothing meritorious, and, consequently, a very excellent and remarkable performance loses the appreciation it deserves.

In spite of the splendid management and organisation of the Victory Cup trial, and the hard and voluntary work of the officials, it has ended unsatisfactorily, as so many similar

trials are bound to do if reliability is determined by a man's ability to ride to a timetable, his knowledge of the exact position of a check, or his ability in speed-judging.

It would save a deal of trouble if the qualifying riders' numbers were put in a hat and a draw arranged for the premier award. This should be more satisfactory to the sporting fraternity, and would be just as efficient a test of reliability as the method in question.

In the coming Birmingham-Land's End and back trial of the Birmingham Club for the Lycett trophy, some other method than timetable riding is wanted, and I have no doubt the officials of the club would hail with delight any suggestion that would assist in this respect. The Birmingham Club is not alone in its desires in this direction. Acceleration, fast and slow hill-climb, petrol consumption, stopping and restarting on hills, etc., are admirable, provided a satisfactory formula and the necessary numerous officials can be found.

JAS. L. NORTON.

HONOUR TO WHOM HONOUR —

Sir,—I read with sympathy the experience of "The Learner" in your issue of April 17th, and cannot help thinking that more publicity might be given to us fortunate ones who have been treated generously by the trade. Some two months ago I was on the look-out for a second-hand sidecar machine. From previous experience I knew that I ran risks, but unfortunately my purse would not allow of a new machine. I saw the mount I wanted at Messrs. Selfridges—a 4 h.p. Calthorpe-Jap and sidecar. I explained at the time that I could not afford to be continually putting my hand in my pocket for repairs. After a short trial the machine did not come up to my expectations. As soon as I explained matters to Messrs. Selfridge they promptly gave me a free hand to have the machine thoroughly overhauled at their expense at any repairers I might choose. In your advertisement columns I saw that Herpin and Sharples, of 47, South Lambeth Road, undertook overhauls. They had my machine three weeks, during which time I visited their shop frequently and saw for myself the excellent work which they put in. These two men were recently aero engine testers in H.M. Forces, and I feel sure that if I had fitted a pair of wings to my machine when they had finished with it I should have flown. I have just returned from a week's holiday without the slightest hitch. I have no interest in either of these two firms other than as a satisfied customer. I wonder if many of your readers have been treated as generously and as well as I.

SATISFIED.

THE FIRST FRENCH
MOTOR SCOOTER.



The model shown, manufactured by M. Blauseur, of Paris, is entirely in the rough, and it is reported that M. Blauseur has made this outfit simply for his own use. The tiny engine is fitted with an overhead mechanically-operated inlet valve, and the drive is by chain to the rear wheel.

ADVANTAGES OF A FOUR-STROKE.

Sir,—I see in your April 17th issue that "Excelsior" wants to know why the majority of people prefer the four-stroke to the two-stroke. I infinitely prefer a four-stroke as a lightweight mount for the following reasons: (1) It is more economical in oil and petrol; (2) it is faster; (3) it does not overheat so easily; (4) it does not use up so many sparking plugs; (5) it carbonises up much less than a two-stroke; and (6) it can sustain speeds of about 35 m.p.h. for quite long periods, whereas if you do that with a two-stroke it gets "tired."

Of course, a two-stroke is a better hill-climber, and is usually rather an easier starter. I once had a New Imperial-Jap that got up to within fifty yards of the top of Birdlip Hill on top gear, and I never had any trouble in starting up with war spirit and 15° of frost.

I think that this compares very favourably with a two-stroke. Though a two-stroke undoubtedly has advantages such as simplicity, lightness, etc., I do not think its advantages anything like outweigh its disadvantages. R.N.

On Active Service.

PULLEY GRIP.

Sir,—With reference to my original letter on this subject, and Mr. R. L. Boyd's letter in your issue of April 3rd, I have not yet seen a ball thrust Grado pulley, as my own is the 1915 model with plain thrust. The wording used by Mr. Boyd does not make it clear on which side of the operating ring the ball thrust is situated; he thinks it ought to be fitted "between the control rod and pulley." Which part of the pulley? He cannot mean the "sliding flange" (i.e., outer flange), as he uses that expression in the next line. However, there is no doubt in my mind that the ball thrust is most needed between the operating ring and the adjustable outer collar. It is also needed to a lesser extent between the operating ring and the outer flange. On my own machine, when the throttle is well open, I find it impossible to lower the gear without momentarily switching off owing to the terrific tendency of the outer flange to close in, which overcomes one's efforts to move the control handle. On the other hand, when running with very little throttle, the pull of the belt is not sufficient to tend to close the flange. In this case the thrust on the operating ring is obviously in the opposite direction, hence the need of two ball thrusts. I found proof of this when I took my pulley to pieces, when I found both sides of the operating ring slightly worn. The lubrication was the difficulty, because grease soon disappeared. Consequently, I fitted a ball race to both sides of the operating ring.

The steel washers made a free sliding fit on the sleeve of the sliding outer flange. By turning down the operating ring to half its original width, room was made on the sleeve for the four washers. This arrangement has given every satisfaction so far, and is quite simple to fit if a lathe is available; the cost is negligible.

I have not used a Whittle belt on the Grado, but my experience with this belt in the past was that it was more inclined to slip than ordinary belts, unless one frequently scraped and dressed the leather: it so soon developed a hard glassy surface in dusty weather. To my mind, there is nothing to beat a Dunlop of generous width, and a Forward fastener (which cannot come unhooked when the belt is running slackly in low gear).

Blackheath.

GRADUATE.

Sir,—I have seen the correspondence in your columns *re* the above and I am in agreement with your correspondent, Mr. R. L. Boyd, that, *re* Grado pulley, the makers' claims are not quite as clear as they might be. During the last four years I have had two machines fitted with this gear, a 2½ h.p. and a 3½ h.p. My experience is that there is very little extra grip on the belt when the belt is slack or in "bottom gear." It is only necessary to try a decent hill to prove his. As soon as the pulley is called upon to do any out-of-the-ordinary work, with the belt slack, the machine commences a series of leap frog jumps and "konks out" with a big effort to jump the moon. On the other hand (and this is my reason for sticking to the Grado) it is an

ideal gear for a solo speed merchant not desirous of out-of-the-ordinary hill climbing. On my 3½ h.p. T.T. model I run the gear at about 4½×1 on top; and with speed up I should take a bit of passing up an ordinary hill or on the level. The pulley is at its best when cornering at speed on an ordinary hill; a touch of the lever brings the machine round without losing revs. The same applies to picking up quickly from a standing start.

Here is a point I cannot understand: it is often claimed as a proof of the pulley's gripping powers that if the control lever were taken away the pulley would run automatically into high gear. Surely this is opposite to the claim that the pulley has a tendency to grip the belt when slipping. If, as is claimed, the outside flange moves inwards when the belt commences to slip, then what really happens is the gear is raised slightly, the movement being equivalent to moving the control lever slightly, but this is not gripping the belt.

Let me say in conclusion that for ordinary solo riding the pulley is, to me, just that much better than a fixed gear that it is not worth the while having a gear box fitted.

Sheffield.

BELT DRIVE.

COURTESY ON THE ROAD.

Sir,—Under the above heading, a letter appears in your issue of May 1st, in which the writer, Mr. C. J. Williams, asks you to put forward an appeal to the newer riders who are just taking up motor cycling to cultivate the old-time courtesy of the road. He quotes an unhappy experience of his, and all who read it must feel sympathy for him. May I, however, give my experience on the road at Easter?

On Good Friday morning I started from Croydon to Eastbourne at a leisurely pace, on my 2½ h.p. Levis. Being unaccustomed to the saddle, I stopped every half hour or so, to stretch myself. On almost every occasion, hardly had I left the saddle, when a sympathetic sidecar would slow down at my side to offer assistance. On one occasion, at Uckfield, the number of offers of help was almost embarrassing, and I quickly continued my journey, thinking gratefully of the fine spirit of comradeship shown by my fellow travellers.

Sanderstead

JOG TROT.

Sir,—I have read Mr. C. J. Williams's letter in *The Motor Cycle* of the 1st inst., and I am sure motor cyclists will agree that many performances such as that of the "gentleman" with the sidecar outfit who damaged Mr. Williams's machine and did not even stop to apologise would do a lot to spoil motor cycling. It seems to me, however, that this is rather an isolated case, at any rate round Kent. I have been out for several runs this year and have experienced two punctures and one "belt break." On each occasion, passing motor cyclists slowed up and asked if they could assist.

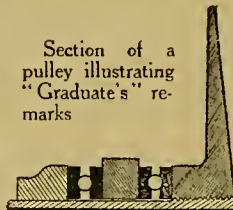
The driver of the sidecar outfit in question would do well to follow the example of the Kent motor cyclists, but if he still pursues his mad career, wishing him no harm, I hope the next thing he bumps into is not the rear lamp and mudguard of another motor cycle, but something such as the back wheel of a steam roller.

H. G. WARDEN.

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Section of a pulley illustrating "Graduate's" remarks

QUESTIONS AND REPLIES

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C.4, and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

Removing a Front Wheel Spindle.

I shall be greatly obliged if you will tell me how to take out the front wheel of a 1913 7-9 h.p. Indian. I have thoroughly examined it and tried my best, but without success. The forks seem too rigid to spring apart sufficiently to clear the hub spindle.—J.P.B.

There is absolutely no difficulty in removing the front wheel of an Indian motor bicycle. All you have to do is to remove the two nuts and knock out the spindle with a lead hammer.

Speedometer Repairs.

Can you please inform me where I can get a Stewart speedometer new hair spring fitted for recording mileage per hour? The one I have, I have found out, is broken, and it will not record speed.—E.W.E.

The makers of the Stewart speedometer, Messrs. Cooper-Stewart Engineering Co., Ltd., 11, Broad Street, Bloomsbury, London, W.C., will probably be able to assist you.

Rear Lamp lighted by Magneto.

I desire to light a small glow lamp (for use in rear light) from the primary winding of my E.I.C. magneto fitted to 1915 Alldays-Allon, and should appreciate your assistance on the following points: Necessary alterations to magneto. Wiring up, viz., in series with contact breaker, or shunt on primary circuit. Am I correct in assuming that when an armature is rotated in a permanent magnetic field the voltage will not exceed a certain fixed point, regardless of revolution of armature, and that neither will electrical damage be caused?—SU 480.

(1) We do not recommend the practice of taking a lighting circuit from the primary of a magneto while it is being used for ignition as well, because it is likely both to interfere with the effectiveness of the spark and to give unsatisfactory lighting. The voltage given by the primary windings under these conditions is complicated by the fact of the self-induction of this circuit when the contact breaker opens. If you wish to carry out this scheme the best plan is to get into touch with Messrs. F.R.S. Lamps, Ltd., Birmingham, who make a special set for this purpose with a transformer coil to reduce the voltage to four volts for the lamp. In any case, the wiring for the lighting circuit must be taken off as a shunt circuit. You are right in assuming that when an armature is rotated in a permanent magnetic field the voltage will not exceed a certain fixed

point. The reaction of the armature prevents this being exceeded. This applies to an ordinary armature, but with a magneto where the circuit is periodically interrupted by the contact-breaker the conditions are different.

Use of Benzole.

I am purchasing a new 1919 B.S.A. and would like to give it a trial on benzole. (1.) Do you advocate the use of benzole in new models? (2.) What is your opinion as to using this spirit in a new 1919 4½ h.p. machine? (3.) Does it tend to carbonise more readily than the present poor qualities of petrol? (4.) Is the flash point higher or lower than petrol? (5.) Would a different jet have to be used, or will the usual jet supplied with the B.S.A. machines take benzole the same as petrol? (6.) Can the same speed, power, and economy be effected from benzole as from petrol? (7.) Does benzole cause overheated cylinders more than petrol? (8.) Can a B. and B. carburetter be used with advantage on B.S.A. models?—H.G.W.

(1.) Yes, if a good quality is obtained. (2.) Quite suitable for any machine. (3.) No. (4.) A higher temperature is required for ignition. (5.) No; the jet of the B.S.A. carburetter is adjustable and is suitable

for either. (6.) Slightly less speed, same power, more economy. (7.) No. (8.) Certainly; but the B.S.A. carburetter is quite efficient when properly adjusted.

Repairing a Carburetter Float.

My carburetter floods owing to a small quantity of petrol in the float. How am I to find the leak and remove petrol?—H.D.M.

Heat the float in a saucepan of water. As soon as the water becomes hot, petrol vapour will be observed issuing from the leak, which can thus be located. The quickest way to get the petrol out of the float is to enlarge the leak slightly, and when the float is quite empty the leak may be soldered over.

The Local Taxation Licence.

I had a B.S.A. motor cycle at the beginning of this year. I took out my licence at the post office, for which I paid £1. I sold the machine recently, and now have a two-stroke. The police inform me that my old licence will not do for this machine. Is this right?—ONE IN DOUBT.

The police are absolutely in the wrong. The local taxation licence entitles you to keep one motor bicycle at a time until the said licence expires.



Hill-climbing expeditions are again becoming popular, and all the well-known acclivities are being revisited. The picture shows a party of motor cyclists on Alms Hill, near Henley.

Cylinder Studs.

[?] I am having trouble with my engine, which is a 1910 7-9 h.p. Peugeot fitted with a clutch on the engine-shaft. I find that one of the bolts which holds the cylinder down is stripped, and I should like to know what means can be employed to remove it.—C.G.

The holding-down bolts are screwed into the crank case, and can be unscrewed by means of a footprint spanner. A better method is to screw two nuts on each bolt tightly one against the other, and then unscrew with an ordinary spanner. Unless the thread is too far gone, when the first method must be employed.

Rear Cylinder will not Fire.

[?] After my 5-6 h.p. Indian had been put aside for several months I found that the back cylinder would not fire. After overhauling it, cleaning carburetter, jet, and plugs, also cleaning and adjusting platinum points, cleaning carbon brushes, taking off cylinder heads, clearing carbon deposit from them, grinding in all valves, inspecting leads to plugs, replacing everything carefully and seeing that all joints are tight, I still find that the back cylinder will not fire. Will you tell me how to find the trouble?—H.J.K.

First of all, see that the magneto is sparking properly and that the current is reaching the back cylinder, then try changing the plug, and finally see that there are no air leaks at the induction pipe or carburetter unions to this cylinder, and that the inlet valve is working properly.

The Rudge Clutch.

[?] (1.) You were good enough to help me with advice before concerning the Rudge Multi clutch. Will you kindly do so again? I have taken the clutch down, cleaned carbonised oil off the projections on the plates, of which, by the way, I found fifty-one; removed the odd plate, raised and lowered the tension of the spring, tried removing another plate, and made various adjustments of the outer cone, and still the clutch engages so fiercely that there is a distinct bark or scream when it is engaged, and the engine stops. The machine has plenty of power when started with the clutch in, and I am at a loss to know what to do now. What would you suggest? (2.) Would you mind giving me some idea of how the plates in this form of clutch engage and disengage?—J.F.G.

(1.) The correct number of plates in the clutch should be fifty. If you have taken the clutch apart, cleaned it, and have omitted to clean all the holes in the main-shaft through which the lubricating oil reaches the clutch, your work has been in vain, and want of lubrication may cause the trouble. If you followed the instructions in the Rudge booklet, and everything is in order and the plates are not excessively worn, there is no reason why the clutch should not be satisfactory. (2.) The spring presses the plates together and locks them up solidly, so that the clutch should take the drive. When the pressure is taken off the plates separate, and the clutch is then free.

Broken Contact Breaker Springs.

[?] Will you please tell me, or suggest any reason why, when riding a 2½ h.p. Douglas, with a Bosch ZA2 magneto fitted, four contact breaker springs should break in four weeks, three of them in the last week? The machine runs well for about ten miles after fitting a new spring. The magneto is oiled according to instructions, and seems quite clean.—A.D.F.-R.

The trouble is probably due to the contact breaker springs being over-hardened.

Low-tension Magnetos.

[?] Please give me some information regarding low-tension magnetos. I have a motor cycle and have no idea of the ignition method employed, and fail to get any spark from the magneto. Also, how do the plugs work?—CONSTANT READER.

There are two types of low-tension magneto used on motor cycles. The first, a very early type, consisted of the magneto producing a low-tension current and was fitted with an oscillating armature. The cylinder was provided with a mechanical make and break. This type was soon superseded, and the next development of the magneto consisted in the production of the Eisemann, which was a rotary magneto developing a low-tension current raised to a high-tension one by means of a coil carried in a compartment of the tank. If by plugs you mean the mechanical make and break inside the cylinder the action is as follows: On the current being generated from the magneto the circuit is broken automatically inside the cylinder and a violent spark jumps across the gap created. The system is open to the usual defects of the complicated piece of mechanism, and leakage of compression is also possible.

The Silencer Regulations.

[?] I should be grateful for information on the question of the degree of silence required by law in the case of a motor cycle. (1.) Is the fitting of a silencer necessary by law? (2.) Does the law leave the necessary judgment to the policeman? (3.) In the event of a silencer being legally necessary, are baffle plates also essential? (4.) What about the machine with a long exhaust pipe?—G.L.W.L.

(1.) The following is an extract from the Silencer Regulations: "He shall not use any cut-out, fitting, or other apparatus, or device which will allow the exhaust gases from the engine of the motor car to go straight into the atmosphere without first passing through a silencer, expansion chamber, or other contrivance, suitable and sufficient for reducing as far as may reasonably be practicable the noise which would otherwise be caused by the escape of the gases." (2.) Even though a motor bicycle may conform structurally to the regulations, it is left to the policeman to say whether or not it is considered noisy in his opinion. (3.) You will also note that no mention is made of baffle plates. (4.) Here, again, comes the question of noise. It might be quite well argued that a long exhaust pipe is, in itself, an expansion chamber.

READER'S REPLY.**A Loose Bush.**

I had the same trouble as your correspondent "J.P." in your issue of April 17th, and got over the difficulty by making a special bush with collar. I should be pleased to help "J.P." if he cares to communicate with me.—H. A. ROGERS.

[A letter addressed c/o The Editor will be forwarded.]

EXPERIENCES WANTED.

B.H.—Bonnixsen Isochronous speedometer.

RECOMMENDED ROUTES.**NUNEATON TO ABERGAVENNY.—T.E.J.**

Nuneaton, Coventry, Kenilworth, Warwick, Stratford, Evesham, Tewkesbury, Newent, Ross, Monmouth, Abergavenny.

ABERGAVENNY TO BARMOUTH.—T.E.J.

Abergavenny, Hereford, Leominster, Ludlow, Craven Arms, Bishops Castle, Montgomery, Welshpool, Llanfair, Dinas, Mawddwy, Dolgelly, Barmouth.

BARMOUTH TO NUNEATON.—T.E.J.

Same route as above to Welshpool, then Shrewsbury, Wellington, Ketley Bank, turn left to St. George's, and along Watling Street through Crackley Bank, Weston-under-Lizard, Gailey, Muckley Corner, Fazeley, Atherstone, Nuneaton.

WITNEY TO CARDIFF.—S.G.P.

Witney, Burford, Northleach, Cheltenham, Gloucester, and back by the route previously given. Approximately 96 miles.

CANTERBURY TO BATH.—A.J.P.

Canterbury, Chilham, Charing, Maidstone, Leybourn, Igham, Seal, Brasted, Westerham, Limpsfield, Godstone, Reigate, Redhill, Dorking, Gomshall, Guildford, Farnham, Odham, Basingstoke, Whitechurch, Andover, Ludgershall, Up-avon, Devizes, Melksham, Box, Bath.

WILLESDEN TO BARROW-IN-FURNESS.—A.B.

Willesden, Harrow, Rickmansworth, Great Missenden, Aylesbury, Bicester, Banbury, Stratford-on-Avon, Alcester, Headless Cross, Kidderminster, Bridgnorth, Wellington, Hodnet, Whitechurch, Tarporley, Warrington, Wigan, Preston, Lancaster, Carnforth, Milnthorpe, Bowland Bridge, Newby Bridge, Ulverston, Barrow-in-Furness.

**BOURNEMOUTH TO STAMFORD, VIA WEL-
LINGBOROUGH.—J.E.B.**

Bournemouth, Christchurch, Lyndhurst, Cadnam, Winchester, Newbury, Abingdon, Oxford, Bicester, Buckingham, Stony Stratford, Newport Pagnell, Bozeat, Wellingborough, Kettering, Great Weldon, Stamford.

ALTRINCHAM TO MINEHEAD.—A.F.T.L.

Altrincham, Northwich, Tarporley, Whitechurch, Wellington, Bridgnorth, Kidderminster, Worcester, Tewkesbury, Gloucester, Stone, Alverston, Bristol, Axbridge, Highbridge, Bridgwater, Minehead.

MOTOR CYCLES FOR SALE.

Alldays.

ALLDAYS 4-stroke, 5h.p., good running order; £24.—T. W. Shaw, Wellington, Salop. [X1027]
ALLON, 1915, 2-speed, lamps and speedometer, stored 2 years; £35.—14a, Alliance Rd., Plumstead. [1137]

ALLON, late 1916, lamps, Klaxon; 38 gns.; unused 2 years; after 5 p.m.—35, Battersea Rise, S.W.11. [1614]

1916 Alldays Allon, countershaft drive, splendid condition; £45.—Rawlinson, Oxford St., Langdon Hill, Essex. [1338]

ALLDAYS Allon, 1915, 2-stroke, new condition; £39, no offers; after 6.—35, Freegrove Rd., Caledonian Rd., Holloway. [1267]

ALLDAYS Matchless, 2½ h.p., 2-stroke, good condition; trial, examination; £50.—17, Goldhawk Rd., Shepherd's Bush, London. [1280]

ALLON March, 1919, 2½ h.p., 2-stroke, 2-speed, h.p. clutch, P. and H. lamps, Lucas horn, condition as new; £57; after 5 p.m.—14, Ravenscroft Park, Harrow. [1323]

Alp

£25.—Alp lightweight, excellent condition; genuine; stamp for reply.—Advertiser, 8, Hatherley Rd., Reading. [1544]

Alycon.

2½ h.p. Alycon, smart lightweight, B.B. carburettor, 24 Bosch mag., good tyres, good running order; £35.—Davies, 54, Greenfield Rd., South Tottenham. [1211]

American, Ltd.

9 h.p. American, Ltd., free engine, lamps, horn, speedometer, not done 4,000 miles, very fast; £65.—H. Wright, Arlesey, Beds. [1537]

Ariel

ARIEL Combination; £50; not before 7.30 p.m.—50, Mann St., Walworth, S.E. [1447]

CROW Bros., High St., Guildford.—Ariel agents since 1915. 1919 deliveries have begun. [5299]

ARIEL, 3½ h.p., new tyres, very fast machine, in excellent condition; £43; seen after 6.—41, Heath Gardens, Twickenham. [1648]

ARIEL, 3½ h.p. and 6-7 h.p.: early deliveries.—F. Speakman, Ariel Expert, 7, Rochdale Rd., Harpurhey, Manchester. [5269]

ARIEL, 3½ h.p., late 1917, 3-speed countershaft, new, overhauled by makers last week.—134, Claremont Rd., Rugby. [X0843]

ARIEL 1914 3½ h.p., 3-speed gear, clutch, new back tyre, in thorough going order; £45 or nearest.—Laarak, Sunbury, Middlesex. [1458]

ARIEL 3½ h.p., T.T., believed 1913, re-enamelled, tyres and engine perfect, new P. and H. lamp set; £45.—Box L1351, c/o The Motor Cycle. [1678]

Arno.

ARNO Motor Cycle, 3½ h.p., Bosch mag., splendid condition; any trial; £45, or offer.—C. Meade, Elms Bakery, 568, High Rd., Leytonstone. [1330]

4 h.p. Arno, mag., B.B., perfect running order, nearly new tyres, lamps, horn; any trial; £38.—Lawn Dale, Cottrells, Hemel Hempstead, Herts. [1711]

Auto-Wheels

WALL Auto-Wheel, good condition; £7/10.—Melbury, Bushey Heath, Herts. [X1064]

WALL Auto-Wheel, perfect condition; £8/15.—8, Wordsworth Rd., Wallington, Surrey. [1557]

AUTO-WHEEL, B.S.A. de Luxe, mileage 250, as new; 12 gns.; offers.—Cpl. Lawrence, 50, Park St., Cardiff. [1617]

FOR Sale, brand new Smith Auto-wheel, just brought in from America, complete with fittings; what offers?—B., 15, Allyn Park, West Dulwich, London, S.E. [X1038]

Bat.

4 h.p. Bat-Jap, spring frame, B.B., clutch, just overhauled, ride away; £30.—Field, 26, Rowan Rd., Bexley Heath, Kent. [1154]

BAT 9 h.p. Combination, 3-speed, car tyres, handle starter, splendid condition.—A.W., 47, Brondesbury Villas Kilburn, N.W. [1406]

BAT-JAP, 8 h.p. Combination, coachbuilt, 2 speeds, clutch, K.S., spare Dunlop new, all accessories; £70; before 10 a.m., after 5 p.m.—Wills, 9, Ravenstone St., Balham. [1151]

4 h.p. Bat-Jap, 1913, engine just overhauled, new piston fitted, tyres and belt as new, spring frame model, £35; also 6 h.p. Minerva twin, fitted new C.A.V. mag., T.T. handle-bars, 26×2½ tyres, one new S.S., new belt, adjustable pulley, very fast machine, not a creak; any trial; £32.—Ford, jun., North Moreton, near Wallingford, Berks. [X1262]

Blackburne.

CROW Bros., High St., Guildford, are old Blackburne agents, and can give early deliveries. [5300]

BLACKBURNE—Sole agents. Book now for early delivery.—Chandler, Eyre and Williams, Sun St. Hitchin. [0999]

JONES' Garage.—We can accept orders for all models of Blackburne motor cycles; delivery expected in April; deposits optional.—Broadway, Muswell Hill. [0992]

We know

THAT by merely promising deliveries of new machines, we could keep a clerk all day and every day booking orders.

THAT we could take any number of deposits, and see our bank balance (like the Fat Boy in Pickwick Papers) "swell visibly."

THAT by buying second-hand machines indiscriminately at fancy prices, we could re-sell at still higher prices.

THAT we could easily obtain premiums for preferential deliveries of new machines.

THAT at the present time—
There is unlimited capital for the asking,
Unlimited opportunities for making big profits.

BUT as we have no intention of sacrificing our reputation—as acquired by ten years of honourable trading—for one year's orgy of boom profits,

WE make no definite promises as regards delivery of new machines.

WE persist in our rule to only sell second-hand machines, as and when they pass through our workshop—where they are completely dismantled and thoroughly overhauled.

WE continue our policy to supply machines in strict rotation at catalogue prices.

AND—

WE are sanguine enough to think that in 1929 Godfrey's, Ltd., will be more firmly established than ever in the confidence of the Motor Cycling public.

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LIMITED,
208, Great Portland
Street, London, W.1.

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Telephone: Mayfair 7091 (2 lines).

MOTOR CYCLES FOR SALE.

Bradbury.

1913 4 h.p. Bradbury, perfect condition throughout; £35.—Inman, 1, Othello St., Liverpool. [1370]

BRADBURY, 1913 (late), 2-speed, kick starter; £42/10.—Robertson, 39, Broad St., Peterborough. [1171]

1914 4½ h.p. Bradbury, 2-speed, pedal start, new coach sidecar; £58.—29, St. Leonards St., Bromley-by-Bow, E.3. [1427]

BRADBURY 4 h.p., 1915, free engine, excellent condition, tyres almost new, lamps, horn; £47.—Knox, 22, Edith Rd., Faversham, Kent. [1491]

BRADBURY—For the earliest possible deliveries of 1919 models try the sole Manchester agent, Tom Davies, 229, Deansgate, Manchester. [6652]

4 h.p. Bradbury Coachbuilt Combination, 3-speed, clutch, splendid condition; £65; trial, seen after 6.—7, Grove Parade, High Rd., Finchley, N. [1593]

FOR Sale, 3 h.p. Bradbury, in good order, Stewart speedometer, Grado variable gear; £30, or exchange for good 2-stroke.—Ingham, Crossley Sanatorium, Frodsham, Cheshire. [X0845]

1919 Bradbury, 6 h.p., new at Easter, twin-cyl., kick starter, chain drive, 3 speeds, free engine, and all the latest, horn and lamps; secured car.—Best offers to Whalley, Clevelly, Croston, Preston. [X1167]

BRADBURY 4 h.p. and Sidecar, N.S.U. gear, B. and B. Bosch, lamps, generator, horn, all accessories, excellent condition; £39; seen Saturdays after 5.—Glenham, Ashurst Rd., North Finchley. [1213]

BRADBURY, 3-speed, clutch, Bosch, B. and B., Druid, nearly new tyres, belt, etc., overhauled, re-enamelled, replated, with comfortable wicker sidecar; 48 gns.—Write, S., 21, Kempe Rd., Kilburn. [1371]

Brough

BROUGH early deliveries, sporting mount.—J. Blake and Co., Liverpool and Manchester. [X0439]

BROUGH, 6 h.p., little used, idle during war; expect trial; first cheque, £50.—McDermott, Shercock, Ireland. [X1046]

Brown.

3½ h.p. Brown, Bosch mag., B. and B. carburettor, good tyres, in good running order; £28.—44, Ormiston Rd., East Greenwich, S.E.10. [X1159]

BROWN-PRECISION, 2½ h.p., 1914, 2-speed countershaft, P. and H. lamps, Stewart speedometer, good condition; £34/10.—163, Loughborough Rd., Loughborough Junction, S.W. [1514]

BROWN, 3½ h.p., 2-speed, free engine, semi-T.T. bars, Amac carburettor, Simms British magneto, splendid condition; £30.—90, Crayford Way, Crayford, Kent. [1604]

B.S.A.

B.S.A., 3½ h.p., fast machine; 32 gns.—68a, Delancey St., Camden Town, N.W. [1543]

3½ h.p. B.S.A., 1914, clutch, lamps, perfect; 45 gns.—76, Western Rd., Southall, W. [1337]

B.S.A., T.T., clutch, new condition; first over £50.—318, Cricklewood Lane, Cricklewood. [1269]

NEW B.S.A.'s in stock; immediate delivery Model K.—Alexander, Agent, Wallasey Village. [1506]

B.S.A., Xmas, 1915, K., almost new Canoelet, lamps, horn, very little used; £80.—2, Chestow Rd., Newport, Mon. [X0973]

B.S.A. Combination, 3½ h.p., 2 speeds, excellent condition and running order.—64, Loughborough Park, Brixton, S.W.9. [1206]

B.S.A., 1919 models, delivery June and July.—Hadow's Motor and Cycle Works, 130, Camberwell Rd., S.E.5. [9232]

B.S.A., 1919 models, early deliveries.—Bastone's, 228, Pentonville Rd., King's Cross, London, N.1. Tel.: 2481 North. [6819]

B.S.A. 1917 Chain-cum-belt Combination, stored 2 years, practically new; £85.—Lt. Moore, Box L1272, c/o The Motor Cycle. [1202]

B.S.A., 1914, 3½ h.p., in first-class condition, new tyres; 50 gns.—199, Pentonville Rd., King's Cross. Phone: Holborn 1812. [1210]

B.S.A. 4½ h.p. Combination, Phoenix sidecar, hood, triple screen, 3-speed, clutch, as new; £90.—47, Pretoria Av., Walthamstow, E.17. [1551]

B.S.A., 3½ h.p., 2-speed, clutch, fine condition and order, little used, Lucas lamp, accessories, cane sidecar; £55.—Child, Northblech, Glos. [X1136]

1913 2-speed B.S.A., mechanically perfect, tyres as new, low gear needs repair, ready to ride away; £35.—Withey, 45, North Bar, Babbury. [X1178]

B.S.A., T.T. I.O.M., late model, specially built throughout; highest over £80 secured; private owner; trial by appointment.—Box L1268, c/o The Motor Cycle. [1183]

FOR Sale, B.S.A. 4½ h.p. motor cycle, 1915, sidecar, lamps, horn, speedometer, good condition, stored 2 years.—Hamilton, Barton Rd., Kennington, Ashford, Kent. [1461]

B.S.A. 1914 3½ h.p., 2-speed, free engine, very powerful, perfect throughout, plating, enamel, and tyres unsoiled, stored 4 years; £60, or near.—1, College Rd., Woking. [1570]

SALE, B.S.A., 1915, 4½ h.p., 3-speed countershaft, chain-cum-belt, almost as new, been stored 2½ years, and little used previously; £65.—Ellis, Cecil Rd., Swanage. [1643]

MOTOR CYCLES FOR SALE.

B.S.A.

B.S.A., all-chain drive, 3-speed countershaft, only done 2,000 miles, speedometer, lamps, etc., like new; best offer accepted; guaranteed.—G. W. Green, Millgate, Thirsk. [X1074]

B.S.A.—For the earliest possible deliveries of 1919 models, specifications, and prices, sole district agents, The Walsall Garage, Wolverhampton St., Walsall. Phone 444. [4669]

1914 B.S.A. and 1916 sidecar, chain drive, speedometer, and all spares, Binks carburettor, splendid condition, little used; £75.—Mungatroyd, 5, Clanning Rd., Birkdale, Southport. [X0995]

1913 B.S.A. Combination, coach-built sidecar, chain drive, in perfect condition throughout, not in use for 28 months; £75, no offers.—37, Daleham Mews, Bel-size Lane, Hampstead, N.W. [X1133]

41 h.p. B.S.A., 3-speed, kick start, just overhauled by makers, perfect condition, and light coach-built sidecar; exchange for higher power.—60, Gladstone St., Desborough, Market Harborough. [X0915]

1914 B.S.A. Motor Cycle, free engine model, in absolutely new condition, not been used throughout the war, complete with Lucas head light; £42/10.—Taylor, Corn Merchant, Billerica. Tel.: 5. [1341]

B.S.A., 3 1/2 h.p., 1913, 2-speed, free engine, belt, absolutely reliable, paintwork good, new electric horn, lamps and batteries, complete with tools and pump; £70 cash.—Kennard, Dumpton House, Ramsgate. [X0925]

1919 All-chain B.S.A., Montgomery sidecar, delivered fortnight; owner has artificial leg, cannot manage clutch; 3 lamps, generators, mechanical horn, screen, apron; offers over £110.—Hart, 21, Queen St., Chesterfield. (D) [X1168]

B.S.A. Combination, beautiful C.B. sidecar, absolutely unsent, not done 1,000, 2 speeds, countershaft, kick starter, clutch, chain-cum-belt, new tyres, lamps, horn, belt mirror adjustable footboards; £75, or exchange car.—1, Bell's Garden Rd., Peckham. [X0979]

B.S.A. 4 1/2 h.p. Bramble Combination, matched, practically new, first time out April 12th, 1919, all chain, 3-speed countershaft, kick start, chassis enclosed, screen, detachable child's seat, Klaxon, P.H. head light, tools; not done 200 miles; nearest £120.—Andrews, 58, High St., Coalville, Leicestershire. [X1037]

B.S.A.—The Birmingham City agents and specialists who confine their business absolutely to B.S.A. manufactures always holds the most complete stock of motor cycles, sidecars, bicycles, etc., and can give immediate delivery of all replacements.—The County Cycle and Motor Co., 307-8, Broad St. Phone: Midland 733. [7250]

Calthorpe.

2 1/2 h.p. Calthorpe-Jap, 2-speed, new tyres; £43.—Pickering, Mardol, Shrewsbury. [1307]

2 1/2 h.p. Calthorpe, 2-speed Precision, ride away; 30 gns.—76, Western Rd., Southall, W. [1336]

CALTHORPE-J.A.P., 1916, 2 1/2 h.p., Enfield 2-speed, splendid condition; £47.—Willred, 4, High St., Chelmsford. [1512]

CALTHORPE 1915 2 1/2 h.p., 2-stroke, countershaft 2-speed gear, stored; £52.—Hanberg, 164, Bower St., Bedford. [X1139]

CALTHORPE Junior, 2-speed, excellent condition, stored since 1916; bargain for cash, 25 gns.—77, Chase Side, Enfield. [1472]

1914 Calthorpe Junior, 2 1/2 h.p., 2-speed, owner buying heavier machine; offers.—Heats, The Nook, Burgh Heath, Surrey. [1228]

CALTHORPE 1917 2 1/2 h.p., 2-stroke, countershaft 2-speed, excellent condition; £41; seen any time. 164, Broadfield Rd., Catford. [1641]

CALTHORPE-J.A.P. 2 1/2 h.p., 1916, Enfield gear, done 700, lamps, speedometer, good condition; highest offer.—Bendit, Queen's, Cambridge. [X0841]

1919 Calthorpe-Jap, 2 1/2 h.p., Enfield 2-speed, sloping tank, run 72 miles; what offers? 4 1/2 h.p. wanted.—Atkinson, 68, St. John St., Coventry. [X1103]

1916 Calthorpe Minor 2-seater Car, dynamo lighting, 5 detachable wheels, like new; £350.—29, St. Leonard's St., Bromley-by-Bow, E.3. [1426]

1916 Calthorpe-Jap, 2 1/2 h.p., Enfield gear, unused 2 years, mileage under 1,000, excellent condition; 38 gns., near offer.—Miller, Smiddyhill, Duns, Berwickshire. [X0930]

CALTHORPE Combination, 4 1/2 h.p. J.A.P. engine, Enfield gear, electric light, sidecar coachbuilt, newly varnished; £75.—Robinson, War Department Signal Factory, Teddington. [1523]

1917 Calthorpe 2-stroke, 2 1/2 h.p., 2-speed countershaft gear, semi-auto. carburettor, front, rear lamp set, tyres good, machine equal to new; £35; after 6.—64, Ravanham Rd., Edmonton, N. [X0931]

1915 Calthorpe-Jap 2 1/2 h.p., Enfield 2-speed, lamp, horn, etc., condition as new, engine just overhauled, perfect, tyres and belt good; £42.—Norfolk House, Spencer Rd., East Molesey. [1568]

1919 Calthorpe, 2 1/2 h.p., 2-stroke, 2-speed gear, with free engine, just delivered and not used; machine delivered nearest station immediately upon receipt 50 gns. cash.—Box 3,504, c/o The Motor Cycle. [X0996]

Campion.

CAMPION. Late 1917, Villiers 2-stroke engine, 2-speed, Dunlops, Amc, perfect order, like new; £38.—Williams, Central School, Carnarvon. [1192]

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CAMEO WIND SCREENS will fit

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TAYLOR'S WIND SCREENS.

25/-, 30/-, 32/6, 47/6.

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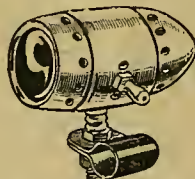
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Very neat and well plated. 7/6

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TERMS:

Cash with order only, and Carriage extra.

Cash returned for any goods not approved of.

MOTOR CYCLES FOR SALE.

Centaur.

4 h.p. 1913 Centaur, B. and B. Bosch, clutch model, fast machine; £30, or offer.—100, Stanley Rd., Teddington. [1287]

FOR Sale, 3 1/2 h.p. Centaur, clutch model, in splendid running order, Bosch mag., new tyres; a real bargain, will accept £36.—Wyatt, 4, Union Grove, Wandsworth Rd., Clapham, S.W.8. [1384]

Chater-Lea.

CHATER-LEA, 2-stroke, 2-speed, good condition; 37 gns.—31, King Edward St., Slough. [X1210]

CHATER-LEA 6 h.p. Combination, coachbuilt, 3-speed, chain drive, enamelled, plated, overhauled, equal new; £80.—3, Park St., Wellington, Salop. [X1025]

Chater-Lea-Fafnir.

CHATER-LEA-FAFNIR, 3 1/2 h.p., wicker sidecar, Bosch, B. and B., chain-cum-belt, variable gear and free engine; £35; after 7.—30, Carden Rd., Peckham Rye, S.E.15. [1449]

Chater-Lea-Jap.

CHATER-LEA-J.A.P., 1913, 6 h.p., Mahon clutch, and cane sidecar, nice condition; £60.—Robertson, 39, Broad St., Peterborough. [1167]

6 h.p. J.A.P. Engine, special Chater-Lea frame, 24 x 2 1/2, Palmer cords, B. and B. carburettor, copper tanks, full T.T. bars, very fast and racy machine, Bosch mag., all mechanically as new, single speed, fixed engine; £30.—Kiddell, H.M. Customs and Excise, Folkestone. [1639]

Chater-Lea-Kerry.

CHATER-LEA-KERRY 5 1/2 h.p. Combination, Armstrong 3 speeds, handle starter, splendid condition; £45, or offers.—Bowles, 27, Albert Rd., Queen's Rd., Dalston. [1321]

Clyno.

CLYNO, 2-stroke, 2-speed, hand clutch; 56 gns.; delivery this month.—Martin Mitchell, Ltd., Stafford. [X9867]

CLYNO 8 h.p. Combination, the model superb; deliveries June.—Martin Mitchell, Ltd., Stafford. [X9868]

CROW Bros., High St., Guildford, West Surrey agents for the 1919 Clyno. Order now to ensure early delivery. [1553]

CLYNO Combination, 6 h.p., 3-speed, lamps, horn, etc., splendid condition; £110.—40, Replingham Rd., Southfields, S.W.18. [1414]

GROVER, Smith and Willis, Basingstoke.—Agents for Clyno combination. Don't wait until the fine weather comes before placing your order. [6263]

6 h.p. Clyno Combination, No. 3 Gloria sidecar, 3 speeds, kick starter, lamps, horn, tools, outfit as new; 105 gns.—Davies, Bowerham Dairy, Lancaster. [X1157]

CLYNO Combination, 5 1/2 h.p., countershaft 2-speed, kick start, Bosch, good tyres, spares; £65; after 6.—Kadwell, 80, Ormiston Rd., Westcombe Park, Greenwich. [1299]

1919 8 h.p. Clyno Combinations. Deliveries commence in June. Place your order with us at once to ensure early delivery. 1919 Clyno 2-strokes; deliveries this month; order at once.—Kays, 116-122, Pitshanger Lane, Ealing. Tel.: 553 Ealing. [9694]

Connaught.

CONNAUGHT, 2 1/2 h.p., splendid machine, in first-class order; £33.—15, Wickham Rd., S.E.4. [1509]

Coulson.

COULSON B; order now.—J. Blake and Co., Liverpool and Manchester. [X0440]

Dot

DOT-J.A.P. 5 1/2 h.p. Twin, sporty, red, Bosch, Binks, Lucas large set; £30.—141, Elgie Crescent, Holland Park. [X1196]

Douglas.

THE Douglas has set the fashion to the world.—Below.

GOURLAY, the Great Douglas Agent, Fallowfield, Manchester. [X0414]

DOUGLAS, 2 1/2 h.p., 2-speed, excellent condition; £50.—Ilokey, Nursery Villa, Chard. [1636]

DOUGLAS, 2 1/2 h.p., 1911, Bosch, running order, fast; 20 gns.—79, Ramz Drive, Westcliff. [1631]

DOUGLAS, 2 1/2 h.p., 1911, just overhauled, excellent condition; £35.—Beddoe, Wurmick St., Worthing. [1144]

1914 Douglas, 2-speed, in good condition; £50.—Mills, The Firs, Spaniards Rd., Hampstead. [1365]

DOUGLAS, 2 1/2 h.p., needs slight adjustment, good condition; £24.—Wood, 76, Stockwell Rd., S.W. [1361]

1911 Douglas, perfect running order, lamps, etc.; £22.—Whitwell, Nook, Broadway, Peterborough. [X1129]

1916 4 h.p. Douglas, sidecar, speedometer, not done 2,000; 85 gns.—17, Garden Av., Mitcham Lane, S.W. [1352]

DOUGLAS 2 1/2 h.p., horn, tyres as new, fast, good condition; £45.—17a, Lytchett Terrace, Richmond, Surrey. [1652]

DOUGLAS, 1914, 2 1/2 h.p., 2-speed, little used, good condition, lamps, etc.; £45.—Lt. Grove, 12, New St., Salisbury. [1377]

MOTOR CYCLES FOR SALE.

Indian.

1915 Indian 3-speed 7.9h.p., kick start, electric lamps and horn, coachbuilt sidecar, excellent order and condition; price £95.—Abergele Motor Co., Abergele. [X0889]

1916 Indian Combination, 5.6h.p., 3-speed, kick start, clutch, coachbuilt sidecar, too fast for owner; 110 gns.—1, Victoria St., Braintree, Essex. [X0889]

INDIAN, 1914, 7h.p., clutch model, stored 3 years, in perfect condition; £60, or exchange good combination.—130, Hither Green Lane, Lewisham, S.E.13. [X0889]

INDIAN, 1916, 6h.p., 3-speed, clutch, kick start, Klaxon, lamps, excellent condition; 70 gns; after 6.—Wingfield, 2, Queen's Mansions, Brook Green. [X0988]

1914 Indian, 7h.p., clutch T.T., used May to Nov., 1914, only, stored since, excellent condition, speedometer, lamp, Brooks saddle; £65.—33, Beaumont St., Oxford. [X0988]

31h.p. Indian Twin, 1917, semi T.T., 3-speed, clutch, kick start, excellent condition, little used, Lucas horn, lamps; £87.—Cunnington, 3, St. Andrew's St., Cambridge. [X0988]

INDIAN, late 1915, 3-speed, clutch and kick start, Millford sidecar, lamps, horn, spares, only run 700 miles; £115 or near offer.—Moy, Beach Hotel, Frinton, Essex. [X0988]

INDIAN 7.9h.p. Combination, coachbuilt, 2-speed clutch, lamp and generator, horn, splendid condition; £90; Saturday, Sunday.—Birks, 702, Holloway Rd., London, N.19. [X0988]

1914 Indian, countershaft gears, clutch, chain drive, 7.9h.p., electric lamps and horn, with Gloria sporting Projectile sidecar, fine outfit; £110.—Abergele Motor Co., Abergele. [X0890]

1914 Indian 7.9h.p., 2 speeds, speedometer, 2 electric lamps, Millford C.B. sidecar, excellent condition throughout; nearest offer to £70.—Jarvis, Prior, St. Peter's Ave., Cleethorpes. [X1114]

INDIAN Combination, 7.9h.p., 1914, 2-speed, clutch, etc., speedometer, lamps, done 7,000, stored during war; nearest offer to £100.—A. V. Campbell, The Croft, St. James's Rd., Harpenden. [X1202]

INDIAN, late 1913, 7.9h.p., T.T. road racer, clutch model, in perfect running order, smart appearance, tyres good as new, complete with lamps, and all accessories; £62.—F. Mehw, Bluntisham, Hunts. [X1368]

INDIAN, 7.9h.p., clutch, T.T. model, disc wheels, long exhaust, lamps, tyres like new, just been enamelled and plated, engine in perfect order; £50, or offer.—262, Blackhorse Lane, Walthamstow. [X1193]

POWERPLUS Indian, 1916 Model F, dual clutch control, electrically equipped, Mills-Fulford Model de Luxe sidecar, coachbuilt, heavily padded, all tyres good; price, including one new spare Dunlop tyre, £120.—Coombs, Cold Harbour, Sherborne, Dorset. [X1661]

INDIAN 1915 7.9h.p. Twin Combination, road racing wheel chassis, sporting type body, enamel and plating as new, heavy Dunlops, 3 lamps, tools, horn, very little used, fast and good climber; 95 gns., no offers.—Bass, "Foulis," Bookham, Surrey. [X1047]

Ivy

IVY-PRECISION, 1915, 4½h.p., 3-speed, clutch, and sidecar; £57/10.—Robertson, 39, Broad St., Peterborough. [X1172]

Ixon.

1915 2½h.p. Ixon 2-stroke, in fine condition, lamps, horn, tools; £27.—Gregory, Aldeburgh, Suffolk. [X1231]

James.

1916 James 2-stroke, 2-speed, as new; £47/10.—29, St. Leonard's St., Bromley-by-Bow, E.3. [X1428]

JAMES, 4½h.p., 3-speed countershaft, all chain, Canoelet sidecar; £85.—272, Green St., Forest Gate. [X1325]

JAMES.—Sole agents for Hertfordshire, 1919 machines in stock.—Chandler, Rye and Williams, Sea St., Hitchin. [X0997]

1913 James, 4h.p., 3-speed, J.S. Sturmer-Archer, £95; with Mills-Fulford cane sidecar, £50.—Oster, Crofts, Witney. [X1278]

JAMES 2-stroke, 2-speed C.S., Amac, Dunlop tyres and belt, in good condition throughout; £40.—Quebeh, Perry Court, Winham, near Canterbury. [X1216]

JAMES 1914 Combination, 4½h.p., exceptional condition; £90; Saturdays by appointment. Phone: 4177 Park—Warner, 10, St. Mary Abbots Terrace, Kensington. [X1413]

JAMES Twin, 3-speed, countershaft, kick start, hand clutch, 2 new heavy Dunlops, extremely fast and powerful, excellent condition; 60 gns.—56, Gibbon Rd., Kingston-on-Thames. [X1170]

JAMES 4½h.p., fixed engine, T.T. model, about 1913, splendid condition, real drier, take 2 anywhere, ride away, very fast; price £35.—Jagger, Claghton St., Kidderminster. [X1188]

JAMES 3½h.p. Twin, 3-speed, hand clutch, all enclosed drive, new tyres, the whole in tip-top condition; £60, or good 2-stroke and cash.—Motorist, 40, Belgrave Rd., Wansted, E. [X1489]

1914 James 4½h.p. Big Single, coachbuilt combination, speeded condition, all-chain drive, countershaft gear box, clutch, kick starter, guaranteed perfect running order, new sidecar, electric lighting throughout, all accessories; £85; after 6 p.m.—7, Ravenhurst Av., Hendon. [X1610]

Specialists for DOUGLAS, ZENITH, MATCHLESS MOTOR CYCLES.

Another unsolicited testimonial.

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To Vivian Hardie, Ltd.

Dear Sirs,

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(Sgd.) H.C.S.

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Beaded Edge, Three Ribbed.

T.T.—			
26 x 2½	Cover 37/3	Tube 11/-	
26 x 2½	" 39/6	" 11/9	
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26 x 2½	Cover 46/9	Tube 11/-	
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	10% advance on Covers		
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Rubber-studded Light—			
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Rubber-studded Heavy—			
26 x 2½	Cover 57/6	Tube 10/3	
26 x 2½	" 60/9	" 11/-	

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MOTOR CYCLES FOR SALE.

James.

1919 4½h.p. James Big Single Combination, 3-speed countershaft, kick starter, James Canoelet sidecar, coachbuilt, all tyres perfect, lamps, mechanical horn, tools, spares, whole in perfect condition, very smart, powerful, and reliable; £120; by appointment only.—108a, Lee Rd., Blackheath. [X1633]

1914 James 4½h.p. Combination, chain drive, 3-speed countershaft, Binks 3-jet, fully equipped, Lucas lamps, mirror, horn, speedometer, little used, perfect condition; cash £90, or exchange with cash for late 6h.p. twin combination; seen Saturday after 11 a.m. or Sunday, also evenings.—Hodgkinson, Cossington, Leicester. [X1034]

J.A.P.

4h.p. J.A.P. Motor Cycle, splendid condition, engine been overhauled; £40.—19, Wilcox Rd., South Lambeth, London, S.W.8. [X1565]

SPECIAL 8-10h.p. Overhead Valve 90x77¼ Racing J.A.P. Combination, late property of Mr. F. Barker, 3-speed Sturmer-Archer countershaft gear, clutch, and kick starter, Bosch, Senspray, American type rims, nearly new 750x75 Avon tyres, lamp, horn, red steel racing sidecar, whole machine practically unscratched, and built for lightness and speed, large adjustable pulley for solo or track; any examination; price £120, or exchange 1916 solo Harley.—3, Courtlands Av., Lee, S.E.12. [X1646]

J.E.S.

J.E.S. Set, Bosch; £10, complete.—10a, Shieldhall St., Abbey Wood. [X1572]

Juno.

2½h.p. Juno-Villiers, 2-stroke, almost new; £36.—19, 24 Wilcox Rd., South Lambeth, London, S.W.8. [X1564]

Levis.

BABY Levis, in good order; £26, bargain.—Hollingshead, Pamber, Basingstoke. [X1175]

LEVIS 2-stroke, splendid running order; £38, no offers.—Beddoe, Warwick St., Worthing. [X1143]

LEVIS 2-stroke, 2-speed gear, excellent condition.—Parker's, 245, Deansgate, Manchester. [X1224a]

LEVIS.—Earliest deliveries; your name on our book ensures this.—Matic Mitchell, Ltd., Stafford. [X9869]

BABY Levis, 2½h.p., 2-stroke, good power; £32/10.—Halifax Motor Exchange, Union St. South. Halifax. [X1343]

LEVIS Popular, 1914, with accessories, stored during war, brand new tyres; £25.—Avery, 8, Priory Rd., Clifton, Bristol. [X1623]

LEVIS, 1916 Popular, splendid condition, easy starter; £35; Saturday, Sunday.—Birks, 702, Holloway Rd., London, N.19. [X1468]

LEVIS, 2½h.p., countershaft, very fine running order; seen any time; £35.—S. W. Goodman, 24, Blechley Rd., Blechley, Bucks. [X0674]

VERY Late 1915 2-speed Levis, excellent running order and condition; £38.—Thorpe, Whitehorse Rd., Thornton Heath, S.E. [X1554]

LEVIS 2½h.p. Popular, late 1917, very little used, lamp, horn, tools; 35 gns.—Cuzner, Langley, Burrell, Chippenham, Wilts. [X1528]

LEVIS.—For the earliest possible deliveries of 1919 models, specifications, and prices, sole district agents, The Walsall Garage, Wolverhampton St., Walsall. Phone: 444. [X4670]

LEVIS Popular Model, Sept., 1915, in perfect running order, just overhauled and fitted with new piston, new Dunlop tyres and Dunlop belt, smart appearance; £34.—F. Mehw, Bluntisham, Hunts. [X1369]

Lincoln-Elk.

LINCOLN-FLK. just overhauled; ride away; £26.—Sticker, 49, High St., Kingston-on-Thames. [X0970]

LINCOLN-ELK Combination, 4½h.p., countershaft gears, kick start, chain and belt drive, engine just overhauled; nearest offer £45.—Peterkin, 61, Hugh Rd., Coventry. [X1251]

Lloyd.

LLOYDS 2-stroke, Albion 2-speed gear, 1918, used 6 months only, excellent condition, almost as new; £50; Cambridge.—Box 3, S29, c/o The Motor Cycle. [X1254]

L.M.C.

L.M.C. 4½h.p. Combination, 3 speeds, clutch, tyres, belt as new, Supreme coach underslung sidecar, very smart; trial; £65.—21, Newton Av., Acton. [X1707]

L.M.C., 4½h.p., late 1914, recently overhauled, Sturmer 3-speed, clutch, Best drip feed, Bosch, Senspray, lamps, horn, A.K.'s. College shields, tyres Avon combination and extra heavy Dunlop, all perfect; £65.—Murray, Chemist, Bruntisham, Edinburgh. [X1187]

Martin.

8h.p. 1913 Martin-Jap, sporting model, lamp, horn, speedometer (less drive), dropped bars, knee grips; £35.—Escombe, Sevenoaks. [X1268]

Matchless

MATCHLESS-J.A.P. 8h.p., tip-top condition; seen 6 p.m.—40, Victoria Rd., Kilburn, N.W. [X471]

1913 8h.p. Matchless, 6-speed Gradua gear, good condition; £60.—Stanley Cobb, The Grove, Esher. [X1217]

MOTOR CYCLES FOR SALE.

Matchless

MATCHLESS, 7.9hp. M.A.G. Swan C.B. sidecar, hood, screen, etc.; £117; any trial.—3, Langdale Av., Mitcham. [1474]

CROW Bros., High St., Guildford, West Surrey agents for the 1919 Matchless. Order now to ensure early delivery. [1552]

MATCHLESS 1914 Combination, M.A.G. 7.9hp., 3-speed, hood, screen, accessories; £115.—J. H. Smith, 61, Albion Works, Lavender Hill, S.W. [1520]

1915 Matchless Combination, M.A.G. engine, 7hp., 3-speed, clutch, and kick start, electric lights; £118.—Paul, Ambleside, Priory Park, St. Albans. [1155]

MATCHLESS 8hp. Coachbuilt Combination, wind screen, 2-speed, kick starter, chain drive, first-class condition; £100.—75, Masons Hill, Bromley, Kent. [X1106]

MATCHLESS Combination, war model, splendid condition, spare wheel, hood, screen, speedometer, lamps, etc.; £128/10.—Ellis, 8, Parkhurst Rd., Boxhill-on-Sea. [X1040]

MATCHLESS-J.A.P., 6hp. coachbuilt sidecar, speedometer, lamps, all in fine condition, 2 new tyres, etc.; 92 gns.—Hillside, Beechwood Rd., Leagrave, near Luton, Beds. [X1048]

1919 New Model H Matchless Combinations, Place your order with us at once to ensure early delivery.—Kays, 116-122, Pitshanger Lane, Ealing, Tel.: 553 Ealing. [9695]

MATCHLESS Combination, late 1917, 3-speed, spare wheel, Lucas lamps and horn, screen, complete, in excellent condition; £155.—Apply, Thames Cottage, Laleham, Middlesex. [1635]

MATCHLESS Combination, 8hp. M.A.G. engine, No. 34018, complete with dynamo lighting, speedometer, wind screen, excellent condition; £130.—Gardner, Gaweitt, Buckingham. [X1169]

31hp. Matchless, 3 speeds, Bosch mag., kick start, Amac, new tyres, tubes, and belt, lamp, etc., re-enamelled and plated, perfect condition; £70.—Hulford, 7, Ermine Rd., Lewisham. [1411]

1912 4hp. Matchless-Jap, just been overhauled, re-enamelled, perfect condition, new B. and B. carburettor, Bosch mag., new tyres and belt; 36 gns., or offer.—The Hollies, West Wickham, Kent. [1662]

MATCHLESS New Model H, spring frame, 8hp. Jap engine. Write at once and book for earliest delivery; Lucas dynamo outfit at option, 5% on your deposit. Decide now and order the best combination.—J. Tassell, 1a Bloomfield Rd., Plumstead. [7704]

MATCHLESS 1914 Combination, 8hp., 2-speed, clutch and kick starter, new coachbuilt sidecar, hood and screen, accessories, stored 2 years, splendid condition; accept £110; seen after 6.30 p.m.—P. Percival, 35, Bramley Rd., N. Kensington, London, W.10. [1395]

MATCHLESS-J.A.P., 8hp., 2-speed, free engine, kick start, tyres fair, new handle-bars, seat, tool-bags, stored for last 4 years, just overhauled; first £65 cash down secures.—H.M.H., North View, Shenley Rd., Borehamwood, Herts. Elstree Station, Midland Rail. [1462]

MATCHLESS, 7.9hp. and sidecar, 1915, 3-speed, clutch model, complete with Druid forks, new heavy tyres, D.A. lighting, lamps, Klaxon, speedometer, mud-flaps, tools, etc., just been overhauled and re-enamelled, better than new; £120.—Write, Capt. Neville, 4, Barn Hill, Stamford, Lincs. [1410]

Metro

METRO-TYLER.—Sole agents for Hertfordshire, Chancery, Regie and Williams, Sun St., Hitchin. [10998]

METRO 2-stroke, 2-speed, red, T.T., long exhaust, as new; £42, or exchange combination.—Ireland, Bungalow, Felpham, Bognor. [X1083]

Minerva

MINERVA 4hp. Twin, mechanical valves, in fine condition, take sidecar anywhere, lamps, horn, etc.; £21, or offer.—Box L1360, c/o The Motor Cycle. [1700]

31hp. Minerva-Chater, Gradim gear, Bosch, new extra heavy Dunlop, good tyres and belt, rehusbed; £25; after 6.—23, Eglinton Rd., Woolwich Common, S.E.18. [1497]

31hp. Minerva, Eisemann mag., Amac, spring frame, 32 very fast, old machine taken part payment; 31hp. N.S.U., £12, or 45 down, 10/- weekly.—The Garage, Albert St., Idles, Yorkshire. [X1115]

Moto-Reve

MOTO-REVE, 24hp. twin, just been rehusbed and overhauled throughout; £18, or exchange high power.—45, Kilmore Rd., Forest Hill. [1470]

24hp. Twin Moto-Reve, magneto requires contact breaker cover, otherwise in good condition; £12, no offers.—Gibson, 101, Springbank Rd., Lither Green, S.E.13. [1606]

24hp. Moto-Reve, mag., Amac, tyres just new, 24 running condition, few adjustments, £10; trial chassis, wheels, tyres and tubes, wheel steering, front and back brakes, heavy chain for drive, £9 or offers; 2-speed epicyclic gear and clutch, made for above, also suit cycle car, £4 10.—A. Gatch, Cheham House, Kettering. [1401]

Motosacoche

MOTOSACOCHE Lightweight good condition; £14.—Write, Walker, Tech. School, Osterley Park, Middlesex. [X1154]

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MOTOR CYCLES FOR SALE.

Motosacoche.

21hp. Motosacoche, Bosch, free engine, spares, just overhauled; £23.—24, Lottie Rd., Selly Oak, Birmingham. [X0700]

24hp. Motosacoche, running order, ready to ride; £42.—Humphreys, Llanfachreth, Dolgellau, Merionethshire. [1501]

MOTOSACOCHE Lightweight, Bosch mag., 1914, 3-speed, running; bargain, £18/10.—Speckley, 1, Gunnesbury Lane, Acton, London. [1560]

1915 Motosacoche, 3½hp. twin M.A.G. engine, Enfield C.S. gear, Bosch, Amac, excellent condition; after 6.—Motor, 305, Green Lanes, N.4. [1462]

New Comet.

1918 2½hp. New Comet, Peco engine, 2-stroke, 2-speed, as new; £50; after 5 p.m.—Horse, 60, Linkfield Rd., Isleworth, Middlesex. [1659]

New Hudson.

NEW Hudson-Jap 2½hp., 3-speed, in good condition; £33.—G. Sheppard, 55, Waurhydd Rd., Tonypool, Glam. [X1138]

NEW Hudson 2-stroke, £52/10; 4hp. combination, £108; deliveries this month.—Martin Mitchell, Ltd., Stafford. [X9870]

NEW Hudson, 2½hp., 2-stroke, 2-speed, free engine, all accessories, as new; £50.—16, Claremont Sq., near Angel, Islington. Phone: Holborn 1812. [1205]

24hp. New Hudson, 3-speed, clutch, kick starter, 24 thoroughly overhauled, nearly new light sidecar for same; £55.—James, 95, Peascoe St., Windsor. [1404]

LATE Model New Hudson, 2½hp., 2-stroke, 2-speed, mileage 650, identical to new; part exchange heavy weight, or sell.—2nd-Lt. Greatrex, 19th Tank Batt., Wareham. [1304]

1914 New Hudson 2½hp. 2-stroke, 2-speed, all accessories, splendid condition; £40.—Apply letter only, when view can be arranged, Capt. Norton, 11, Southwell Gardens, S.W.7. [1613]

1914 3½hp. 3-speed New Hudson, semi-T.T., new Dunlop tyres, Bosch mag., requires about £5 worth repairs; owner, regular officer on leave, has not time to wait for new parts; what offers?—Pottinger, Long Sutton, Langport. [X0964]

New Imperial.

NEW Imperial-Jap 2½hp., 2-speed, bought December; £42.—20, Fairmount Rd., Bexhill-on-Sea. [X1111]

NEW Imperial-Jap, 1916, 2½hp., 2-speed, new condition; £42.—Brookfield Garage, Swains Lane, Highgate, Hornsey 1657. [1493]

NEW IMPERIALS. Call and inspect the latest models.—Sole London agents, Rey's, 173, Great Portland St. Phone: Mayfair 879. [9677]

NEW Imperial J.A.P., 1916 2½hp., 2-speed, countershaft, kick start, hand clutch, lamps, horn; £47/10.—29, St. Leonard's St., Bromley-by-Bow, E.3. [1423]

NEW Imperial-Jap 2½hp., 2-speed, late 1915, Klaxon horn, excellent condition; £39.—Macquire, 50, Raymouth Rd., Bermondsey, S.E. (Before 9 or after 6). [1673]

NEW Imperial-Jap, 2½hp., August, 1916, 2-speed countershaft, pulley, chain, sprocket, piston, valves, guides, all bearings new 1918, new heavy Dunlops, 24in.; £40.—Edwards, Weston Underwood, Olney, Bucks. [X0697]

24hp. Imperial-Jap, excellent condition, 24 gear, semi-T.T. bars, practically new heavy Dunlops, powerful P. and H. lamp, generator, horn, long exhaust, sporty mount; accept £45, no offers, first cheque secures.—Hawes, 98, Grafton Rd., N.W.5. [1316]

Norton.

JACK HEALY, Cork.—Norton official agent for the South of Ireland. [X8335]

CROW Bros., High St., Guildford, Norton agents; let us reserve you one. [5301]

BROOK Bros., Burnham, Som., are sole agents for Norton; early delivery assured. [1698]

NORTON 1916 4hp. Solo, as new; seen any time; 90 gns.—245, Hammersmith Rd. [1719]

NORTON 4hp., 1914, 3-speed, clutch, lamp set, excellent condition; 52 gns.—King, Egrove Farm, Oxford. [X1144]

NORTONS.—For quick deliveries try the sole Manchester agent, Tom Davies, 229, Deansgate, Manchester. [4428]

LIVERPOOL and District Agents for Norton. Place orders now to secure early delivery.—Victor Horsman, Ltd., 9, Parr St., Liverpool. [0004]

DAN BRADBURY, 224, London Rd., Sheffield, the well-known Norton exponent and agent, will give you earliest possible delivery of Nortons. [7269]

NORTON, 1916, T.T., 3½hp., countershaft, chain, cum-belt, fully equipped, perfect condition inside and out; £80.—355, Norwich Rd., Ipswich. [1335]

1916 4hp. Norton, 3-speed, clutch, lamps, etc., and Norton coachbuilt sidecar, in beautiful condition; £96.—Emmison, Cockayne Hatley, Pottton, Bedfordshire. [1417]

NORTONS.—We are now booking orders for the latest model Norton solo and sidecar outfits; £5 deposit; deliveries in strictest rotation.—Maudes, 100, Gt. Portland St., London, W.1. [5675]

MOTOR CYCLES FOR SALE.

T.D.C.

T.D.C. 4h.p. Coachbuilt Combination, clutch, 3-speed Sturmer-Archer, Dunlop heaves throughout (nearly new), lamps, horn, tools, etc., all in splendid condition and running; seen after 6 p.m.: £60.—T.D., 79, Clyde Circus, Tottenham, N.15. [X1223]

Triumph.

3 1/2 h.p. Triumph, single speed, stored 4 years; £36.—19, Oxford Rd., Dagenfield. [X1265]

TRIUMPH, 3 1/2 h.p., clutch model, very good condition; £32.—53, St. Lawrence Rd., Brixton. [X1442]

3 1/2 h.p. Triumph, fixed engine, in splendid running order; £35.—5, Camberwell Terrace, Leamington. [X1218]

BROOK Bros., Burnham, Sou., can give early deliveries of Triumph cycle. Write for particulars. [X1699]

TRIUMPH, 3 1/2 h.p., clutch, new tyres; £45.—Halifax Motor Exchange, Union St. South, Halifax. [X1345]

TRIUMPH, 3 1/2 h.p., 1913, clutch model, excellent condition; £40.—112, Ridley Rd., Forest Gate, E.7. [X1469]

BABY Triumph, late 1915, 2-speed, new condition; £47/10.—29, St. Leonard's St., Bromley-by-Bow, E.3. [X1422]

TRIUMPH.—Triumph spare parts supplied by Coventry Motor Mart, Ltd., London Rd., Coventry. [X0613]

TRIUMPH, 1913, thoroughly overhauled, and in fine condition, very fast; £42/10.—Abergele Motor Co., Abergele. [X0386]

TRIUMPH, 1913, 3 1/2 h.p., free engine, good condition; £42.—Robertson, 39, Broad St., Peterborough. [X1173]

TRIUMPH, 1914, countershaft gears, clutch, splendid bargain; 60 gas.—10, Puget Rd., Lordship Park, N.16. [X1466]

1914 4h.p. Triumph, 3-speed, clutch, lamps and horn, been stored, equal to new.—Box L1,292, c/o The Motor Cycle. [X1239]

TRIUMPH, 1909, 3 1/2 h.p., toning model, needing repair; £12.—Eastern Garage, 418, Romford Rd., Forest Gate, E.7. [X1251]

TRIUMPH 3 1/2 h.p., U.H. mag., B. and B. new tyres, mechanical horn, overhauled; £20.—Harris, Homestead, Birchington. [X0842]

TRIUMPH, 3 1/2 h.p., T.T. model, just been renovated and overhauled; £35, or near offer.—262, Blackhorse Lane, Walthamstow. [X1148]

TRIUMPH, 1912, running order, good tyres, lamps, variable pulley; first cheque £28 secures.—Lt. Grove, 12, New St., Salisbury. [X1380]

1913 3-speed Triumph, mechanically perfect, new tyres, lamps, horn, tools, nice machine; £48.—Withey, 43, North Bar, Banbury. [X1179]

TRIUMPH, 3 1/2 h.p., clutch model, Phoenix C.B. sidecar, good tyres, belt, lamps, etc.; £48 cheque secures.—Brickell, Gillingham, Dorset. [X0962]

TRIUMPH, 1912, free engine, new tyres, 3 belts, accessories, all spares, little used; £38.—Aherne, 28, Wargrave Av., South Tottenham. [X1177]

TRIUMPH 1914 4h.p., clutch, 3-speed, lamps, speedometer, and all accessories, perfect condition; £50.—Box L1,350, c/o The Motor Cycle. [X1677]

3 1/2 h.p. Triumph, 2 speeds, free engine, lamp set, speedometer, sporting sidecar, etc.; £47.—Carter, Bryn Terrace, Cardiff, Pontypool, Moa. [X0938]

TRIUMPH 3 1/2 h.p., pedal start, foot clutch, excellent condition, ready for any journey; £35.—Bunting, Mason's Av., Wealdstone. [X1596]

TRIUMPH 3 1/2 h.p. and Sidecar, F.E., tyres nearly new, good running order; £33.—Martin, c/o Dixon, 53, Station Rd., Anerley, S.E.20. [X1622]

TRIUMPH 3 1/2 h.p., 2-speed, free engine, new Dunlops, just overhauled, splendid condition; first £37.—Box L1,270, c/o The Motor Cycle. [X1185]

TRIUMPH, 1913, T.T., fast and sound, lamps, Klaxon horn, Palmer cord tyres, been stored; £40.—Lt. Grove, 12, New St., Salisbury. [X1378]

TRIUMPH, fitted new heavy Dunlops, nice condition; cash offers; or will exchange with cash for combination.—Riches, 71, Approach Rd., E.2. [X1484]

3 1/2 h.p. Triumph, 1910-11, just overhauled, new 32 cylinder and piston fitted, good running order; £40.—Lt. Bowes, Markethill, Co. Armagh. [X1085]

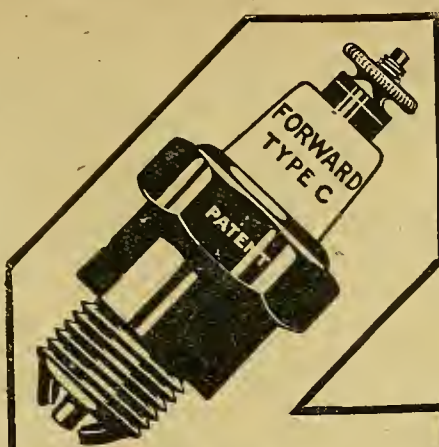
2 1/2 h.p. Baby Triumph, 1915, new condition, small mileage, carefully used, all accessories; best offer over £50.—2, Vickers Rd., Erith, Kent. [X1367]

TRIUMPH, 3 1/2 h.p., 3 speeds, clutch, kick start, Bosch, electric lamps, etc., condition as new; 65 gas.—Root, 156, Archway Rd., Highgate, N.6. [X1600]

TRIUMPH, 3 1/2 h.p., T.T., 1913, just overhauled and re-enamelled, perfect order, fast and reliable, accessories; £45.—Eyre, 12, Chaffinch Rd., Beckenham. [X0911]

TRIUMPH 3 1/2 h.p., 2 speeds, free engine, just overhauled and enamelled green, tyres and tubes perfect; a bargain, £40.—45, Kimberley Rd., Stockwell, S.W.9. [X1459]

3 1/2 h.p. Triumph Coachbuilt Combination, 3 speeds, 32 Bosch mag., just overhauled; £60; trial between 1 and 4 Saturday.—Belle Vue, Ruskin Av., Waltham Abbey, Essex. [X1361]



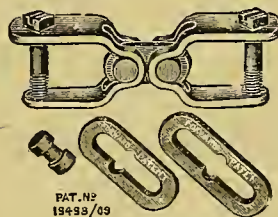
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Triumph.

1912 Trinnip Motor Cycle, 3 1/2 h.p., spare valve, tools, decompressor, engine perfect, ready to drive; price £40, no offer.—Apply, J. G. Ramsay, Park Crescent House, Erith, Kent. [X1138]

TRIUMPH 4h.p., clutch, semi T.T. new tyres and belt, 1914 model, like new, splendid order; £50, or exchange good lightweight, Douglas preferred.—Threlfall, 78, Penny St., Lancaster. [X1427]

TRIUMPH, 4h.p., lamps, speedometer, Klaxon, T spares, just been thoroughly overhauled; indistinguishable from new; £60, or near offer.—15, Meadow Rd., St. Kennington Church, after 6.30. [X1356]

TRIUMPH Junior, splendid condition, 2-speed, countershaft, lamps, new unused spares; sell, or exchange with cash for first-class combination.—Phylmaro, Woodgrange Av., North Finchley. [X1608]

4 h.p. Countershaft Triumph, Oct., 1915, stored 3 1/2 years, only ridden 500 miles, condition like new, Lucas lamps and horn, spares, owner bought car; 80 gas.—Ganderton, Newton, Paignton, Devon. [X0967]

TRIUMPH Junior, brand new 1919 model, not done 80 miles, fitted 2 1/2 in. heavy Clinchers, horn, speedometer, back lamp and generator, all tools; £30 cash; seen after 11 o'clock Sunday.—148, Clements Rd., East Ham. [X0965]

1912 3 1/2 h.p. Triumph, N.S.U. gear, just been overhauled, grand condition, £36/10; Singer, 2 1/2 h.p., Philipson, new Dunlop tyres, very fine order, £32; Gloria coupe sidecar, suit Trinnip, £3/10.—Hick, Sherburn, York. [X1642]

TRIUMPH 3 1/2 h.p. 1912-13 Combination, 3-speed S.A. hub, clutch, extra large vicker sidecar, 4-point attachment, electric light, speedometer, new Clincher Dreadnought tyres, first-class running order; £55, no offers.—Apply, 13, Champion Grove, Denmark Hill, S.E. (After 4 p.m.) [X1496]

TRIUMPH, 1914, 4h.p., 3-speed hub gear (Sturmer-Archer), and 1915 Gloria sidecar coachbuilt combination, in good condition and perfect running order, Lucas lamps, bulb and mechanical horns, accessories and tools, tyres almost as new; what offers? no dealers.—Apply, H.E., Box L1,265, c/o The Motor Cycle. [X1180]

TRIUMPH, 3 1/2 h.p., N.S.U. 2-speed, coachbuilt combination, stored during war, complete set tools, accessories, spare belt, brand new tube and tyre, carrier for petrol can, supplementary oil tank, wind screen, apron, sidecar excellent condition, engine refitted this month, ready for road; £68.—Commander Brown, H.M.S. "Egmont," Chatham. [X0928]

Velocette.

VELOCETTE, 2 1/2 h.p., 2-speed, chain-cum-belt, in excellent running order; £38.—Tracy, 7, Woodfield Cres., Ealing. [X1440]

LIVERPOOL, and District Agents for Velocette. Place orders now to secure early delivery.—Victor Horsman, Ltd., 9, Parr St., Liverpool. [X0005]

Villiers.

LIGHTWEIGHT Villiers 2-stroke, 2-speed, splendid condition, new tyres; £30.—Adams, 31, South Rd., Southall. [X1518]

Vindee.

1915 4 1/2 h.p. Vindee Twin, 4 speeds, countershaft gear box, kick start, spring frame, drip feed, fully equipped, and absolutely as new; £58.—49, Medway Rd., Bow. [X1710]

V.S.

4 5-h.p. V.S. Twin, take 2 anywhere, £25, first cash; Philipson pulley, fit Bradbury, as new, £4.—Edzell, Springhill, Coleford, Somerset. [X1500]

Whitworth-Arnold.

WHITWORTH-ARNOLD Motor Cycle, 3 1/2 h.p. twin, a.v., Bosch mag., B. and B., perfect condition; £25.—Garland, 3, Benlath Terrace, Elm Grove Rd., Weybridge. [X1421]

Williamson.

8 h.p. Williamson Combination, in perfect condition; £95.—16, Trinity Sq., Brixton. [X1703]

WILLIAMSON Combination, 2-seater sidecar, 8h.p. V.C. Douglas engine, just done up; £110.—Apply, Box 3,494, c/o The Motor Cycle. [X0935]

WILLIAMSON Water-cooled 8-10h.p. Combination, in excellent order; £110, or exchange Indian.—Melrose, 1, Kenlor Rd., Tooting. [X1434]

WILLIAMSON Combination, 8h.p., hood and screen, late 1914, lamps, horn, spares; £110, or near offer.—Woolgrove, Street Farm, Little Barford, Deddington. [X0691]

WILLIAMSON Combination, 8h.p., water-cooled, coachbuilt sidecar, disc wheels, long exhaust, lamps, horn, tools, powerful, fast, very smart appearance, and in excellent condition; £120; no offers or dealers.—L. Wyse, 11, Oakhill Av., Hampstead, N.W. [X1415]

Wolf

WOLF-J.A.P., 1917, 2 1/2 h.p., 2-speed, clutch, kick starter, in perfect order; £45.—Robertson, 39, Broad St., Peterborough. [X1166]

WOLF 2 1/2 h.p., fixed engine, U.H. mag., Amac, enamel and plating perfect, £27, or near offer; plain coil, 71; accumulator, 4-volt 11 amps, 71; B. and B. lightweight carburettor and controls, new variable jet, 30; 2 exhaust whistles, 3/6 each.—17, Kingsway, Coventry. [X1250]

MOTOR CYCLES FOR SALE.

Wolf.

1916 Wolf 2½ h.p. 2-stroke, 2-speed, kick start, head and rear lamps, horn, excellent condition; £30.—Rowe, The Gardens, Wyberton, Boston, Lincs. [1650]

Wooler.

WOOLER.—Enquiries solicited.—37, The Daleham Garage, Belsize Lane, N.W., sole agents for the N.W. districts. [1945]

Yale.

LATE 1915 7-9 h.p. Twin Yale, little used, guaranteed in thorough condition; £80: seen after 6 o'clock.—6, Methuen Park, Muswell Hill. [X1142]

Zedel.

ZEDEL 3½ h.p., clutch, B. and B., Simms, tyres perfect, lamps, pump, ride away; £19: after 6 p.m.—6, Helmsley Terrace, Mare St., Hackney, E.8. [X0977]

Zenith.

4-5 h.p. Twin Zenith, countershaft and clutch model; £80.—Pickering, Mardol, Shrewsbury. [1311]

ZENITH, 1914, 90 bore, with sporting sidecar, and accessories; £94.—Youngs, Parade, Kilbryn, Hampstead 4807. [1687]

ZENITH-GRADUA 1915 6-8 h.p. J.A.P. Combination, coachbuilt sidecar, good tyres, any trial; £85.—18, Chesilton Rd., Fulham, S.W.6. [1445]

ZENITH-GRADUA, 6 h.p., lamps, horn, very fast, smiles at hills, tyres, enamel, machine good condition; trial; £60.—64, Balloch Rd., Catford. [1313]

8 h.p. Zenith Countershaft Combination, late model, black and grey Canoelet, perfect order and condition; £110.—Arc Engraving, Ashcombe Rd., Wimbledon. [1301]

6 h.p. Zenith, 1916, and sidecar, very fast, electric lamps, speedometer, mechanical horn, first-class; £90: after 2 p.m.—9, Booneville Gardens, Clapham Park, S.W.4. [1488]

1914-15 4 h.p. Zenith-Gradua, perfect condition, tyres and belt as new, has been stored, few accessories; £45.—Orchardleigh, Picardy Hill, Belvedere, Kent. [1333]

ZENITH, 3½ h.p., 1913, piston and rings fitted recently, tyres and belt nearly new, lamps and accessories, ride away; £39: seen after 6.—Eric, 36, Stockwell Park Rd., S.W.9. [1476]

ZENITH, specially built, 8 h.p., side valve engine, racing sidecar, 2 bodies, fastest and smartest outfit on the road, not done 500 miles, usual accessories and tools, snip; £125.—573, High Rd., Tottenham, N. [1530]

ZENITH, 5 h.p. twin, 1914 countershaft, fully equipped for the road, Montgomery streamline sidecar, locker at rear, new belt, new inner tubes, real sports outfit, not used since 1915; £75.—51, Station Rd., Gillingham, Kent. [1159]

Ladies' Motor Cycles.

LADY'S Motosacoche, just overhauled and enamelled, as new; £35.—Beddoe, Warwick St., Worthing. [1141]

Miscellaneous.

THE H.C. Motor Co., 347, Finchley Rd., N.W.3, have the following machines for disposal:

IVY 1919 2½ h.p., 2-speed, new machine; list price.

NEW Hudson 1913 3½ h.p., 3-speed, clutch, guaranteed; 37 gns. (160.)

SCOTT Combination, 1913, 3½ h.p., coach sidecar, 2-speed, kick start, in perfect order; 55 gns. (178.)

NEW Imperial 1916 2½ h.p., 2-speed, T.T. model, just overhauled; 35 gns. (177.)

DENE-PRECISION, 1914, 4 h.p., 3-speed, clutch, as new throughout; 55 gns. (179.)

DOUGLAS 1915 2½ h.p., 3-speed, T.T., unscratched; 62 gns. (181.)

TRIUMPH 1912 3½ h.p., clutch model, T.T. bars, overhauled; 29 gns. (174.)

PULLMAN Pilot, 1914, 3½ h.p., 3-speed, clutch, just overhauled, J.A.P. engine; 30 gns. (154.)

DOUGLAS 1914 2½ h.p., T.T. model, 2-speed, very fast; 45 gns. (180.)

ENFIELD 1915 3 h.p. T.T. Model, 2-speed, Enfield gear, just completely overhauled; 47 gns. (176.)

N.S.U. Combination, 1914, 3½ h.p. twin engine, 2-speed, kick start and clutch, complete with sidecar; 49 gns. (175.)

TRIUMPH 1915 2½ h.p., 2-speed, 2-stroke, like new; 59 gns. (169.)

WOLF 1915 2½ h.p., 2-speed, 2-stroke, in fine order, and very fast; 36 gns. (148.)

THE H.C. Motor Co., 347, Finchley Rd., N.W.3. Phone: Hampstead 4631. Open Saturday afternoons and Sundays. [9490]

6 h.p. Twin, running order; 37 gns.—405, Rotherhithe New Rd., Camberwell. [1705]

5-6 h.p. Combination, C.B., pillion seat, take 3 easy; £60: after 6.—31, Winehendou Rd., Teddington. [1477]

B.S.A. and N.S.U. C.B. Combinations; £45 and £65.—Lieut. North, 37, Montpelier Crescent, Brighton. [X1211]

THE LEADING MIDLAND HOUSE for MOTOR CYCLES

We hold Agencies for the following Motor Cycles, and can give earliest possible delivery:—

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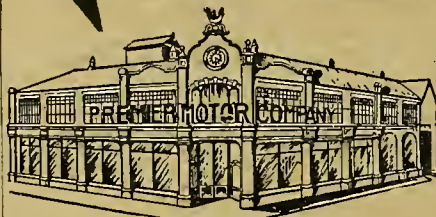
TRIUMPH

HENDERSON "4"

AMERICAN-EXCELSIOR

Sole Birmingham Agents for
MONTGOMERY SIDECARS.
Immediate delivery of Models Nos. 1 and 2.

**THE PREMIER
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Your Golden Opportunity.

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**Any modern motor
cycle or combination.**

Send us brief particulars, price, and when and where to be seen. We pay prompt cash or take in exchange, as you prefer. Don't miss your chance, as, with increased supplies, the price of second-hands will fall.

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**289-293, HIGH HOLBORN,
LONDON, W.C.1.**

Phone: 6430 Holborn.

MOTOR CYCLES FOR SALE.

Miscellaneous.

5-6 h.p. Bat, Minerva engine, gears, £28; Metro, India red, disc wheels, £35; bargain.—Sapsworth, 2, The Terrace, Tonbridge. [X0971]

LIGHTWEIGHT, 2½ h.p., French make, semi-T.T., Bosch, low and fast, good condition; £22.—Grimwood, Histon, Cambs. [1174]

4 h.p. Motor Cycle, new horn, and acetlene lamps, adjustable pulley, ready to ride away.—L. Firstbrook, Old Mill, Daneuth. [1618]

MOTOR Cycles, any make new machine supplied on best terms; quick delivery secured; second-hand bargains in motor cycles and combinations.—The Mart, 151, Caledonian Rd., King's Cross, London. [1690]

3 h.p. N.S.U. Motor Cycle (slight repairs), £9; 3½ h.p. N.S.U., 2-speed, free engine, kick start, sidecar, £25; 3½ h.p. Ceofour, mag., ride away, bargain, £15.—Smith, 34, Preston Rd., Standish, near Wigan. [X0993]

6 h.p. Twin Combination, 3-speed countershaft, kick start, 3 lamps, horn, many spares, including chain and valves, Mills-Fulford coachbuilt sidecar, hood and screen, all in good and smart condition, ready to ride; £80; London district.—Box LL359, c/o The Motor Cycle. [1685]

BODIES.

VENUS.—Singles, tandems, stepped, and underslung; cheapest in trade.

VENUS.—Touring, sporting, tradesmen's; repairs, repainting; exchanges.

VENUS.—The sidecar body experts. Bodies, any design, in the rough if desired.

VENUS.—Bodies direct from factory to user; save money; lists ready, write.

VENUS Sidecar Co., 6-8, Gouley St., S. Tottenham. [6754]

SIDECAR Body, coachbuilt, new, mahogany wind screen, uncrated; first £8 secures.—Jones, Brownleigh, Hulsead. [X1053]

SIDECAR Bodies, coachbuilt, smart design. Trade supplied in the white or finished. Prices right.—Cooper, 90, Brighton Rd., Birmingham. [X1140]

COACH Bodies, special for lightweights, 28 lb., fit any chassis, any colour, strong, sporty; cheap.—Venus Sidecar Co., 6-8, Gouley St., S. Tottenham. [1358]

BASTONE'S for Sidecar Bodies.—Coachbuilt, underslung, step pattern, and lightweights in stock; inspection invited; at clearance prices.—228, Pentonville Rd., King's Cross, London, N.1. Tel.: 2481 North. [8817]

SIDECAR Body Designs for the trade only. Working, coloured, pencil, or line drawings of original designs, also working drawings, full-sized or to scale.—Cooper's Vehicle Journal, Ltd., established designers to the coach trade for over 80 years. Consult us when designing new ideas.—20, Tudor St., London, E.C.4. [0818]

HOODS, WIND SCREENS, ETC.

NEW Morgan Hood for sale.—Apply, A.W., 47, Brondesbury Villas, Kilburn. [1407]

EASTING Wind Screen, perfect, only used once.—32, Gracechurch St., E.C.3. Tel.: L.W. 6336. [X1176]

SIDECAR Wind Screen, steel fittings, fixed in two minutes; 20/.—Geo. Pratt, 45, High St., Hunningdon. [X0839a]

SIDE-CARRIERS AND PARCEL-CARS.

TRADESMAN'S Box Delivery Sidecar, Canoelet, complete, ready for use, off 3½ h.p. motor; £810.—Sims, China Store, 15, Railway St., Chatham. [X0681]

N.S.U. Carrier, 5-6 h.p., with mag., 2-speed, free engine, new tyres, in good order, suitable for a tradesman; £50.—Kilner's, 1, Wickham Rd., Beckenham. [1286]

SIDECAR ATTACHMENTS.

MIDDLETON'S.

MIDDLETON'S make Sidecars, they do au' all.

MIDDLETON'S Flier still dodging the coppers.

MIDDLETON'S Sidecars have won more gold medals, cups, reliability trials, and records than most of you have had hot dinners.

MIDDLETON'S Sidecars tout drag der motor unt wear in ond, or dake zo much pedrol. Goot! I pay vud. Special terms to Scotchmen.

MIDDLETON'S recognise that no lady, however smart, can fancy herself or swank if sitting in a Ford, so always advise a sidecar.

MIDDLETON'S have nothing to say against Henry. Like the man in a frock coat, with bowler hat and brown boots, Henry doesn't realise what one looks like in his car.

MIDDLETON'S can only supply a limited number for Whitsun, so look slippy.

MIDDLETON'S.—That's the name you careful teetotal chaps; now push the boat out and buy the wife a sidecar. Better to do your own taking out you know.—27, Strand Green Rd., Fishbury Park, N.4, near Tube. Phone: Hornsey 1584. [6281]

WICKER Sidecar; £6/10.—272, Green St., Forest Gate. [1328]

SIDECAR ATTACHMENTS.

FOR Sale, Montgomery sidecar, cane chair; £3/10.—1, Apsley Villas, Acton, W. [1533]

LIGHT Sidecar, excellent condition, new tyres; £10.—4, Byfield Gardens, Barnes, S.W. [1207]

ARIEL Coachbuilt Sidecar, 5-point attachments; £10.—E. Burton, Winterringham, Doncaster. [X1174]

LIGHT Coachbuilt Sidecar, good condition; £10.—6, West Heath Av., Golden's Green, N.W.3. [1214]

SIDECAR for Sale, coachbuilt, good condition; £6.—Root, 156, Archway Rd., Highgate, N.6. [1601]

WICKER Sidecar, off Triumph; £3/15; in good condition.—Sisley, Henbury, Macclesfield. [1372]

NEW 1919 Service Underslung Coachbuilt Sidecar.—Lapford, Coumbe Lane, Kingston Hill, Surrey. [1272]

B.S.A. Coachbuilt Underslung Sidecar, absolutely as new; £16, no offers.—Withy, 43, North Bar, Banbury. [X1180]

SANDUM Sidecars.—Sidecar bodies in metal, coach, cane, and wicker; prices to suit all.

SANDUM Sidecars.—2-seaters to suit Indians and Harleys.

SANDUM Sidecars.—Hoods, screens, and aprons. Repairs, repainting, and re-upholstering at factory prices; chassis and frame repairs.

SANDUM Sidecars.—The new super-2-seater, to comfortably accommodate 2 full size adults. Ask us about it.

SANDHAM Engineering Co., 336, Gray's Inn Rd., W.C.1. 'Phone: Holborn 933. [X0617]

BASTONE'S for Sidecars at low prices.—228, Pentonville Rd., King's Cross, London, N.1. [8816]

CORONET Sidecars. Send for illustrated catalogue.—Booth's Motories, Portland Place, Halifax. [1507]

CORONET Sidecars for B.S.A., Triumph, Harley Davidson, Phelon-Moore.—Booth's Motories, Halifax. [N5128]

SANDUM Sidecars.—Bodies in welded metal and coachbuilt; always 100 in stock; prices to suit everybody.

SANDUM Sidecars.—2-seaters to suit Harleys and Indians. Ask to see our super-seater, which carries two 6-foot passengers.

SANDUM Sidecars.—Wholesale manufacturers of coachbuilt bodies, chassis, hoods, screens, aprons, etc.

SANDUM Sidecars.—Most noted body builders in the country. Every workman an expert.

SANDHAM Engineering Co., 336, Gray's Inn Rd., W.C.1. 'Phone: Holborn 933. [X1012]

WICKER Torpedo Sidecar, Watsonian, new; £12.—J. Downes, 92a, Farnbridge Rd., Maldon, Essex. [1507]

BRAND New Douglas Body and Chassis, complete with apron; 25 gas.—202a, Hammersmith Rd. [1720]

SIDECAR (bath chair), complete with tyre, good condition; 45/—Turtle, 11, Buxton Rd., East Sheen, S.W. [1443]

COACHBUILT Sidecar, nearly new Dunlop tyre, perfect condition; £15—73, Broomwood Rd., Clapham Junction, S.W. [1416]

RENNOC Sidecars are manufactured at the Rennoc Motor Sidecar and Engineering Works, 86, Victoria Rd., Stroud Green, London, N.4.

RENNOC Sidecars are designed and manufactured under the personal supervision of Mr. George Conner.

RENNOC Sidecars.—We supply lugs, rims, spokes, upholstery material, tubing, springs, and all fittings for any make sidecar.

RENNOC Sidecar Bodies, hoods, screens, wheel discs, etc., actual manufacturers, wholesale, retail, and export.

RENNOC Sidecars.—We specialise in frame repairs to motor cycles and sidecars.

RENNOC Sidecars.—Special department for sidecar body repairs, repainting, upholstery, lining, etc.

PHENIX Sidecars.—The Rennoc Co. can supply all spares and undertake repairs for this make.

RENNOC Sidecars.—14 models to fit all motors; tandems a speciality.

RENNOC Sidecars.—We can give immediate delivery of most models.

RENNOC Sidecars to suit Harley, Yale, Indian, Excelsior, Pope, and all American models.

RENNOC Sidecars specialise in motor cycle and sidecar frame repairs, enamelling and plating.

RENNOC Sidecars.—are actual manufacturers of hoods, screens, and wheel discs.

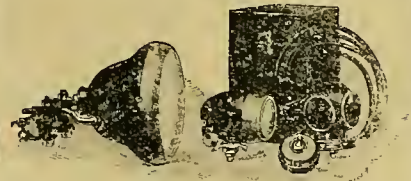
RENNOC Sidecars have always in stock second-hand and clearance sidecars; special list.

RENNOC Sidecars have in stock 17 different design bodies to suit old and new pattern chassis.

RENNOC Sidecars advise you to place your present sidecar with us to be overhauled, we have a special department.

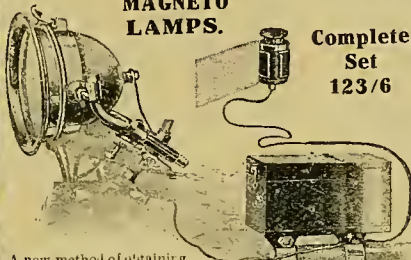
RENNOC Sidecar Works, 86, Victoria Rd., Tollington Park, Stroud Green, London, N.4. (George C. Conner, Managing Director.) 'Phone: Hornsey 850. [18860]

F.R.S. ELECTRIC



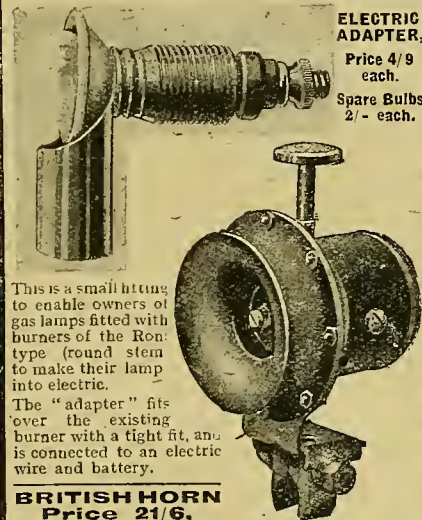
Sidecar sets, complete, as above 153/-
Lamps only, with handle-bar fittings 45/-

MAGNETO LAMPS.



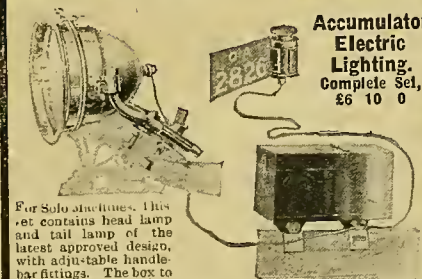
A new method of obtaining light, suitable for two lamps, from the extra current produced by magneto, which has been wasted so far. As soon as engine starts the lamps light. Perfectly simple and foolproof. No trouble in future to get your lamps lit. A accumulator is fitted into box for use when machine is at a standstill.

Complete Set 123/6



This is a small fitting to enable owners of gas lamps fitted with burners of the Ron type (round stem) to make their lamp into electric. The "adapter" fits over the existing burner with a tight fit, and is connected to an electric wire and battery.

BRITISH HORN
Price 21/6.



For Solo machines. This set contains head lamp and tail lamp of the latest approved design, with adjustable handle-bar fittings. The box to fit on the top tube contains a 4-volt accumulator and a switch, giving sufficient light for the two lamps for approx. 10 hours at one 2 amp. fit, without doubt, fills a long-felt want for solo machine lighting.

F.R.S. LAMPS, "BEAM" Works, Persnore Street, BIRMINGHAM.

SIDECAR ATTACHMENTS.

SIDECAR, excellent, roomy, built to order 1916, 3in. tyre, Harley green.—Seen Lacey's Garage, 27, High Rd., Streatham, London. [1189]

SIDECAR (one only), complete, for spring frame Indian immediate delivery; £28/10.—Youngs, Parade, Kilburn, Hampstead 4807. [1686]

PERFECTION Coachbuilt Sidecars, 15 gas.; new Perfection coach bodies, £6/5.—Halifax Motor Exchange, Union St. South, Halifax. [1346]

WICKER Sidecar, good condition, with fittings, excellent for 3 1/2 h.p., brand new tube and cover; £5.—Ivey, Hornchurch (Upminster Station). [1248]

MORRISON'S Spring Wheel Chassis, re-enamelled black, new tyre and tube, 4-point attachment, complete; £5.—Edwards, Syston, Leicester. [1510]

SIDECARS and Chassis, touring, tradesmen's, and sporting models, good variety; deliveries from stock.—Burbury Sidecar Works, Farm St., Birmingham. [9324]

GLORIA Cane Sidecar, perfect condition, waterproof cover, luggage grid, fittings for Rudge or Triumph; lowest price £16; full particulars given.—Pape, Driffield, Yorks. [X0976]

DOUGLAS 4h.p. Coachbuilt Sidecars, with aprons, brand new, in stock, immediate delivery, £20; for other makes £1 extra.—Douglas Specialists, Robinson's Garage, Green St., Cambridge. Tel.: 388. T.A.: Bicycles. [1667]

RUNABOUTS AND CYCLE CARS.

8h.p. De Luxe Morgan; £120.—Wanchop's, 9, Shoe Lane, London. [1581]

ALLDAYS Midget 2-seater, 1913; £135.—272, Green St., Forest Gate. [1329]

MORGAN, 1914, hood, screen, C.A.V. lighting.—39, Clifton Gardens, Maida Vale, W. [1517]

A.C. Sociable, speed 30-32, good hill-climber, reliable; £50; any trial.—3, Park St., Wellington, Salop. [X1031]

CYCLE Car, 8h.p. J.A.P. engine, friction drive, requires overhauling; 40 gas.—232, Brixton Rd., S.W.9. [1540]

DUO Cycle Car, 2-seater, 2-cyl., 8h.p., hood, screen, good condition; £60.—Williams, Furzy Mount, Camrose, Pem. [1259]

MORGAN, Grand Prix, water-cooled, overhead valve J.A.P.; fast, sound; £140; any trial.—13, New St., Wellington, Salop. [X1030]

LIVERPOOL and District Agents for G.N.—Place orders now to secure early delivery.—Victor Hornsman, Ltd., 9, Parr St., Liverpool. [0001]

HUMBERETTE, water-cooled 8-10h.p., 1915, fully equipped, new condition throughout; £193.—Robertson, 39, Broad St., Peterborough. [1169]

A.C. Sociable, in perfect running order, speedometer and electric lighting, complete; £75.—B. Underwood, 59, Station Rd., Willesden Junction. [1222]

MORGAN, type 1917, 8h.p., 700×80 tyres, hood, screen, speedometer, pumps, etc., splendid condition; £120; any trial.—Tandy, Kano, Crewe. [1657]

EAGLE Cycle Car, 8h.p. w.c. De Dion engine, Bosch mag., 5 new 760×90 tyres and tubes, requires overhauling; bargain, £35.—16, York St., Dover. [1405]

MORGAN, sporting, 1914, 8-10h.p. J.A.P., in good condition, hood, screen, lamps, and speedometer, very fast, low mileage; 125 gas.—Baawell, Keevil, Trowbridge, Wilts. [1586]

CARDEN Monocar, 1913 model, 4h.p. Precision, chain drive, plate clutch, slight repairs needed, engine and mag. in good condition; offers.—Ekins, Catisfield, Raeham, Hants. [1634]

MORGAN, A.C. 8h.p. J.A.P. engine, wind screen, hood, side curtains, 5 lamps, electric light, gas, etc.; £150; any trial; after 6 o'clock.—W.B., 179, Balaam St., Plaistow. [1208]

CYCLE Car, 4-cyl., Binks air-cooled engine, 2-speed, reverse, live axle, differential, brand new back tyres, complete, except for carburetter; seen Oatlands Park Garage, Weybridge; £55. [1194]

CYCLE Car 8-10h.p. Twin Engine, Bosch mag., 3-speed and reverse gear box, forming one unit, tubular frame, most fittings to complete, as new; price £40.—Box L1.326, c/o The Motor Cycle. [1391]

8h.p. De Dion 2-seater, single cyl., mag., 2-speed, good running order, hood, screen, lamps, tools, spare tyres; £40, or exchange for motor cycle; seen by appointment.—37, Canningham Rd., Tottenham. [1275]

MORGAN Runabout, 8h.p. air-cooled J.A.P., 1914, electric lighting hood, screen, fast and economical, in good condition throughout, ready to drive away; best offer over £100; no dealers.—Holly View, White Rose Lane, Woking. [1574]

RAILWAY Garage, Staines ('phone 139), have in stock 1916 Morgan, G.P. o.v., £165; 1914 Dew cycle car, £145; 1913 G.W.K., paintwork excellent, £185; Salmon, 1ch.p. streamline, racy, £255; Baby Mathis, very smart, £325.—See Cars. [1695]

1916 Carden Monocar, 5.6h.p. J.A.P., 2-speed, disc wheels, electric lighting, mechanical horn, wind screen, excellent tyres, painted grey and black, paintwork unscratched, best looking Carden on the road; £92, or exchange car.—Capt. Haig, O.T.T.S., Halton Camp, Wendover. [X1154]

RUNABOUTS AND CYCLE CARS.

1914 A.C. Sociable, in perfect condition, recently overhauled, B type engine (95x102 mm.), Harcourt radiators, B. and B. top feed carburettor, auxiliary hot air intake, Bosch mag., tyres new, hood, screen, and all accessories: £5 worth of spares; expert inspection invited: £95 for quick sale.—R. Bentley, 148, Marrowbrook Lane, Cove, Hants. [X1044]

CARDEN Monocars, 1919 models. Sole concessionaires.—The Railway Garage, Staines, are now delivering ideal runabouts for pleasure, for commercial, and professional men: 105 gns., dickey seat extra. Specification: 8hp. J.A.P., seat starter, Sturmer-Archer 3-speed gear box, removable scuttle, Dunlop tyres. Supplied in strict rotation against deposit. Call and inspect. [1698]

CARS FOR SALE.

1917 or 1907? It doesn't matter, they're all equally good running order when my staff of 30 experts have done with them. I say it with pride that some of my 1907 cars run better and will probably give better service than many 1917 models offered elsewhere. Also my descriptions may be relied on and dates advertised are guaranteed accurate.—Cox (below).

1914 1/2 hp. Warwick Box Auto-carrier, £60; A.C. 5-wheel sociable, runs really nicely, £70; 12hp. l'orman 2-seater, mag., £95; 15hp. Darracq lorry, 4-cyl., mag., solids all round, 15-cwt., £120; 12hp. Swift 2-seater, gate, mag., engine just overhauled, £125; 14-16hp. Darracq lorry, cab front, monobloc, 15-cwt., £145; 8-10hp. P.H.A. light car, streamline 2-seater, low and sporty, pointed radiator, live axle, £145; 15hp. 1911 Darracq 4-seater, Coronation type, £165; 10hp. Delahaye van, enclosed valves, 4-speed gate, torpedo front seat, £185; 1915 Ford 4-seater, smartly repainted, £185; 15-20hp. New Pick torpedo, monobloc, enclosed valves, Claudel, £195.—Cox (below).

1917 2-seater Ford, £200; 16-20hp. Rover landaulet, engine and gear box single unit, smart body, grey cloth interior, £225; 10hp. Waverley light car, streamline 2-seater, 4-cyl. monobloc, Chapuis-Dornier engine, Zenith, £235; 10hp. Ilurru 2-seater, 4-cyl. monobloc, enclosed valves, gate, Solex, dash radiator, £245; 12hp. Albruna 2-seater, dickey, 4-cyl. monobloc, C.A.V. dynamo lighting set, £250; 12-15hp. Siron 2-seater, semi-sporting, dickey, Claudel, gate, £275; 15hp. White chassis, monobloc, 4-speed gate, enclosed valves, £285; 11-9hp. Briton 4-seater, torpedo, detachable wheels, pointed radiator, enclosed valves, £295; 15hp. 4-cyl. Standard streamline torpedo, gate, Zenith, smartly repainted, £325.—Cox (below).

1917 1/2 4-seater Maxwell, streamline, electric starter, dynamo lighting, monobloc, detachables, £335; 12-15hp. F.I.A.T. streamline 4-seater torpedo, monobloc, dynamo lighting, £350; 12-15hp. Panhard landaulet, late, 4-cyl. monobloc, smart body, nice car, £385; 15hp. Standard wide 3-seater, double dickey, monobloc, enclosed valves, worm drive, Saakey detachable wheels, £385; 15hp. Arrol-Johnston torpedo 4-seater, Saakey detachables, enclosed valves, 4-speeder, £385; 12-16hp. Sunbeam landaulet, detachable wheels, enclosed valves, 4-cyl., £450; 12hp. Knight-Daimler coupe 2-seater, 4-cyl. monobloc sleeve valve engine, 11.9hp. rating, worm drive, detachable wheels, £485.—Cox (below).

ROLLS-ROYCE Sporting Streamline 2-seater, 4-cyl. 20hp. model, domed mudguards, disc wheels, Bosch, Zenith, smart, bargain this, £500; 15hp. Knight-Daimler limousine, beautiful condition, detachable wheels, worm, electric lighting set, frameless windows, smart, £525; 15-30hp. sleeve valve Argyll coupe, particularly smart, wide 3-seater, dickey, fast, and sleek, 4-speed, Zenith, splendid condition, £550; 15hp. De Dion super-taxi, landaulet, monobloc enclosed valves, 3-speed, 15hp. 4-cyl. sump lubrication, Scotland Yard, £565; 18-24hp. 1914 1/2 Sideley-Deasy chassis, sleeve valve, 4-speed, detachable wire wheels, worm drive, cantilever springs, £650; 15-20hp. 1917 1/2 F.I.A.T. chassis, special heavy duty type, twin pneumatics, detachable disc wheels, C.A.V. dynamo lighting set, long stroke monobloc, enclosed valves, exceptional opportunity, £750; magnificent dome roof super-landaulet body, suit either last two, £200 fitted.—Cox (below).

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Garage, Tooting. [1630]

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THE Lowest Rates for motor and other insurance, obtainable from Tharp's, 9, Norton Folgate, Bishopsgate, E.1. Tel.: L.W. 274; and Irvinghoe, Grove Hill, Woodford, E.18. [8113]

COVER your motor cycle by The Bell (at Lloyd's) comprehensive policy.—For prospectus and full particulars apply R. G. Howard, 5, Moorgate St., Buildings, London, E.C.2. [9318]

COMPLETE Comprehensive Policies. Motor cycles from 37/6; Morgans, 75/-; immediate repairs permit.—Wrigleys, Lancashire's Premier Motor Insurance Brokers, The Corner, Houghton St., Southport. [1592]

DREADNOUGHT Motor Cycle Policies at Lloyd's. Premiums from 21/7 1/2 per annum, payable yearly, quarterly, or monthly. Before insuring elsewhere, write for prospectus, Roys, Ltd., 170, Gt. Portland St., London. [0994]

"THE Motor Cycle" Insurance Policy (subscribed by Lloyd's Underwriters) covers motor cycle or cycles and sidecars used for private purposes. Complete comprehensive cover. Maximum benefits, minimum rates. Free weekly copy of "The Motor Cycle" to all policy holders paying a premium of £37/6 or over.—Full particulars and prospectus on application, The Manager, "The Motor Cycle" Insurance Department, 20, Tudor St., London, E.C.4. [0995]

TUITION.

SIDECAR Driving.—Ladies and gentlemen quickly made proficient.—41, Ashford Rd., Cricklewood. [9584]

SIDECAR Driving Lessons by private owner, 15 years' experience, mechanism also taught.—C., Salisbury House, Hazlitt Rd., W. Kensington (near Olympia). [X1209]

MOTOR Tuition.—The British School of Motoring, Ltd., gives the highest standard of training in driving, mechanism, and repairs for the lowest fees in England. Call, or write for full particulars.—The British School of Motoring, 6, Coventry St., Piccadilly Circus, W. [0953]

SHIPPING.

BUYING and Shipping for Colonial motor and cycle importers.—The best service through Lindner and Co., Ltd., Birmingham. Established 1842. [4577]

SITUATIONS WANTED.

CYCLE Mechanic, demobilised, requires situation in London district, army certificate.—L., 34, Bilton St., Barking. [1235]

WANTED, by youth with experience turning, boring, drilling, etc., situation as above with motor cycle or similar firm: South-west England preferred.—Box 3,517, c/o *The Motor Cycle*. [X1110]

GENTLEMAN, discharged, 23, desires position with motor cycle and car business as junior salesman or demonstrator, 7 years' mechanical experience, 4 1/2 years' despatch riding: Liverpool-Manchester districts preferred.—Box 3,492, c/o *The Motor Cycle*. [X0690]

The Leamington Pillion Seat

Patent

Child's size,
With guard
and extra
straps to
hold child in.

34/-

Full size,

40/-

Complete
with Hair-
stuffed
cushion.
Spring
cushion,
6/- extra.

Spring Cushion for Carrier Riding

With Straps, 10/6

With 2 Clips and
Under-plate, 12/6



Cycle Works,
Newcastle, Lingfield,
Surrey.

Dear Sir,

The Spring Cushion for Pillion Riding which we had just before Easter has been on a long tour to the Midlands and the North, and has given our customer complete satisfaction.

Yours faithfully,

SYDNEY WALLIS.

W. J. BRADLEY, Patentee and Manufacturer,
69, Regent Street, LEAMINGTON SPA.

Enamelling OUTFIT No. 1.

For Motor
Cycle and
Sidecar.



INCLUDES an ample supply of absolutely everything you need to thoroughly renovate a Motor Cycle and Sidecar. Contents: Sponge, Chamois Leather, Rubbing Felt, Pumice Block, Robbialac Brush, Glass Paper, Cleaning Soda, Pumice Powder, Auto-Stopper, "Rusoline" Polishing Liquid, Robbialac Thinners, Robbialac Stopping, Mat, Gloss, Transparent; and Instructions. Price 35/-. Carriage extra England and Wales 1/6, Scotland and Ireland 2/-. Full particulars, including large Colour Card, from Jenson & Nicholson, Ltd., M.C. Outfit Dept., Robbialac Works, Stratford, London, E.15. Sole manufacturers of



SITUATIONS WANTED.

TO Manufacturers.—Capable Gentleman wishes to get into touch with a go-ahead firm of light car or motor cycle builders to manage agencies and travel the British Isles, or would take sole selling rights on contract, 16 years' experience, and has interest in the retail business, with proved organising and controlling abilities.—Box L512, c/o *The Motor Cycle*. [7787]

SITUATIONS VACANT.

EXPERIENCED Chauffeur, London district, capable of attending to running repairs, required for swift commercial light car.—Write, F.P., c/o J. W. Vickers and Co., Ltd., 5, Nicholas Lane, E.C.4. [1290]

OFFERED to Keen Salesman already representing firm of standing in motor trade, two good saleable lines largely advertised and in demand, worked as a side line would show a handsome return; satisfactory terms.—Apply, Box L1,266, c/o *The Motor Cycle*. [1181]

HOTELS AND APARTMENTS.

COLWYN Bay, Rhos.—The Towers, Whitehall Rd., 7 doors from Osley Promenade. Supper, bed, breakfast, garage, 8/6.—Tel.: 233. [6633]

PARTNERSHIPS.

EXPERIENCED Sales Manager desires partner with capital to open motor cycle and motor accessories business, good proposition to one willing to invest; principals only dealt with.—Write in first instance with details, Box L1,267, c/o *The Motor Cycle*. [1182]

ADVERTISER desires active position in motor car and/or motor cycle trade, willing to invest up to £1,000 in a really going concern, remuneration required £400 per annum, age 25, public school education, several years' commercial experience, at present holding a responsible position in a large commercial house in London, but is desirous of getting into the motor trade.—Reply in first instance to B. 189, c/o Deacon's, Leadenhall St., E.C.3. [X0992]

GARAGES.

MOTOR Cyclists Note.—Private garage, use of bench; 2/- weekly.—195, Elgin Terrace, Maiden Vale. [1161]

AGENCIES.

AGENCY Wanted.—Motor cycles, cycles, and accessories. Advertiser opening up new premises main North London road.—Box 3,531, c/o *The Motor Cycle*. [1525]

OVERSEAS Agency.—Member of A.I.F., shortly returning Australia to resume position of business manager, will accept approved agency N.S.W. (other States arranged for if desired) of motor lorries, charabancs, touring cars, motor cycles, motor accessories; one make only accepted; good business references submitted.—H.T., c/o Grundy, Lamb, and Grundy, Solicitors, 14, John Dalton St., Manchester. [X1113]

W. SAUNDERS, Ltd.—This private company was registered on March 12th, 1919, with a capital of £12,000 in £1 share. Objects, to acquire the Red Garage and Motor and Engineering Works of the late W. W. Saunders, 26 and 28, Crouch St., Colchester, one of the oldest established motor businesses in the county of Essex. W. Saunders, Ltd., still have vacancies as agents (sole or otherwise) for high-class cars, light cars, runabouts, and motor cycles.—Tel.: Red Garage, Colchester. Phone: 392. [1178]

GENERAL TRADE.

RELIABLE 2-stroke Engine Units.—Would be pleased to hear from firm interested.—Box 3,530, c/o *The Motor Cycle*. [X0844]

MOTOR Cycle Frames.—Quotation required from frame manufacturers for a large number of cycle frames.—Apply, Meteor Mfg. Co., Ltd., 98, Tollington Park, N.4. [1409]

WANTED, firms who can undertake the manufacture of quantities of small motor cycle gear parts. Must be first-class workmanship and good deliveries: Birmingham or London district.—Write, Box L1,328, c/o *The Motor Cycle*. [1393]

ADDRESSES of Firms making deep drawn stampings, 3-16in. plate, 3in. deep, 2 1/2in. diameter, cups, connecting rod stampings, valves, crankshaft stampings, gear cutting, small turning, cylinder boring, valve fitting.—Box L1,327, c/o *The Motor Cycle*. [1392]

PERSONAL.

L2397—If not claimed will be sold to defray expenses.—Webster's Garage, Folkestone. [1242]

WANTED.

A **SUNBEAMS**, Harleys, A.J.S.'s, Enfields, B.S.A.'s, Nortons, Triumphs, Matchless, and Morgans; 1915's and later purchased for spot cash.—Mandee, 100, Gt. Portland St., London, W.1. [1918]

A **AAA**.

BRING your machine to us before taking it elsewhere. We will buy for spot cash; highest prices given. Lightweight and twin combinations particularly wanted. Ride up with machine, and walk out with cash.—The H.C. Motor Co., 347, Finchley Rd., N.W.3. Phone: Hampstead 4631. Open Saturday afternoons and Sundays. [5669]



Advertising and Publishing Offices:
20, Tudor Street, London, E.C.4.

Telegrams: "Cyclist Fleet, London."
Telephone: 2845 City (five lines).

Editorial Offices:
Hertford Street, Coventry.

Telegrams: "Motorecycle, Coventry."
Telephone: 10 Coventry (five lines).

Northern Offices:
199, Deansgate, Manchester.

Telegrams: "Hiffs, Manchester."
Telephone: 620 City.

Subscription Rates: Home, 15s. 2d.; all countries abroad, 19s. 6d. per annum.

The Foreign rates quoted above apply also to men in the Services abroad.

COLONIAL AND FOREIGN AGENTS:

UNITED STATES—The International News Agency, New York.

CANADA—Toronto News Co., Ltd., Toronto; Montreal News Co., Ltd., Montreal; Winnipeg News Co., Winnipeg; British Columbia News Co., Vancouver; Gordon & Gotch, Ltd., 132, Bay Street, Toronto.

AUSTRALIA—Gordon & Gotch, Ltd., Melbourne (Victoria); Sydney (N.S.W.); Brisbane (Queensland); Adelaide (S.A.); Perth (W.A.); and Launceston (Tasmania).

NEW ZEALAND—Gordon & Gotch, Ltd., Wellington; Auckland, Christchurch, and Dunedin.

INDIA—A. H. Wheeler & Co., Bombay, Allahabad, and Calcutta.

SOUTH AFRICA—Central News Agency, Ltd.

PARIS—Smith's English Library, 248 Rue Rivoli.

The Price of Fuel.

IN last week's issue we announced a belated reduction in the prices of motor fuel, and quoted the figures sent to us by the Shell Marketing Co. It now transpires that the figures were *trade prices*, and that the reduction to the public is only threepence per gallon. There was no such intimation on the postcard advice we received.

Such a small concession can hardly fill any devotee of the motor cycle with glee. Many times we have been told that the exorbitant prices of petrol have been due to Government control, and that when this was relinquished an appreciable reduction in the price of fuel could be confidently expected.

We are not convinced that the present high prices are necessary; but the spirit which was responsible for the statement on the part of an official of the Petrol Trust, that "The value of anything is what it will fetch," still prevails among the petrol kings.

One has only to compare the enormous numbers of motor vehicles used in the U.S.A., where the price of petrol is low, with the size of the British motoring fraternity, to realise the importance of the question of cheap fuel, and the retarding effect high prices are likely to have upon the future expansion of automobilism in this country. Given fuel at the prices ruling before the war, there is no reason to doubt that the United Kingdom will use motor vehicles in the same proportion to its population as the United States.

At present the cost of petrol is placing a limit on long journeys; and, economical as is the type of machine we use, motor cyclists do not ride the distances they would if the price of fuel were more reasonable. In the meantime, motor cyclists and, in fact, motorists generally, are being forced to the conclusion, as we have often pointed out, that it is necessary to be independent of imported fuel, and will continue to use benzole whenever it is obtainable.

Motor Cycle Prices.

WE are often asked by readers if the prices of motor cycles are likely to fall, and we have regretfully to answer that it is most unlikely; in fact, it is more than probable that prices will continue to rise for some time to come.

We all know that the cost of materials is high, and that the cost of labour is ever-increasing. It is not reasonable, therefore, to expect that motor bicycles will become cheaper in the near future.

There seems to be only one solution of the difficulty, and that is, the question of production. Manufacturers who are in a large way are able to turn out a large number of machines, using the latest tools and the latest labour-saving devices, and will be able to sell more cheaply to the public than the small maker whose rate of production is only a comparatively few machines. We see signs in every direction of an unsettled state of affairs in the motor cycle trade. From one day to another the manufacturer does not yet know how much to charge for his new models, and this fact is reflecting very heavily upon the private purchaser.

The manufacturer in his catalogue or preliminary list makes some such statement as "prices are subject to alteration without notice." This is a very hard rule, and it has meant that in many cases a prospective purchaser who has paid his deposit to an agent for the machine he is anxious to buy at, say, £60, receives one morning a letter from the agent, some weeks before the machine is due for delivery, to the effect that the price has been raised £5 or £10. The feelings of the prospective purchaser may be well imagined, and he is more often than not prone to vent his wrath upon the unfortunate agent, who is no way responsible.

Though we fully realise the difficult position of the manufacturer, he should use every effort to give the prospective purchaser fair warning of what is about to take place.

Occasional Comments by "Ixion"



Those Trophies.

A FEW years ago any wealthy sportsman with a habit of distributing massive silver trophies was a popular person in motor cycling clubland. To-day any wideawake secretary gets his doctor to certify that he is suffering from smallpox if he hears that a plutocrat is contemplating such misplaced generosity. Circumstances compelled me to emphasise this *impasse* even in pre-war days, but the difficulty of boiling down an entry of 100 good men on 100 good mounts to one absolute winner is far graver than ever it was. The problem is acute in a one day event of the daylight type. In twenty-four or forty-eight hour rides, darkness strings the men out a little, but not sufficiently to separate the real cracks appreciably. In the Six Days Trials of the future, the superfine quality of the entrants will tend to counterbalance the length of the route, and make it increasingly difficult to allot single awards, such as a special prize for the best performance by an amateur. Secretarial ingenuity is apparently exhausted. Secret checks, speed tests, split-second timing at controls, fuel consumption, flexibility climbs, speed judging, freak hills of the 99% eliminating type, and all other conceivable factors have been introduced. Most of them entail an intolerable amount of work. Most of them allot the special award with no greater fairness than if the names of the gold medal winners were shaken up in a hat, and one were drawn at random. I have accompanied several big trials in which one or more of the special awards were certainly questionable. I believe the sport has reached a stage at which we should choose between eliminating the single victor (*i.e.*, restricting the awards to gold medals for all gaining a certain percentage of marks) or awaiting a brainwave of consummate genius. The factors of selection employed in 1913-1914, and foreshadowed for the minor events of the present season, are the sorriest makeshifts. Such a policy is certainly desirable so far as Saturday events are concerned. [This paragraph was written before the publication of Mr. Norton's letter in our last issue.—Ed.]

Limitation of Entries.

FURTHERMORE, unless I am much mistaken, reforms are no less necessary in regard to the number of competitions and the size of the entries. There is not a word to be said against club members' events, or even against such events being thrown open to amateur riders from neighbouring clubs. But the 1913 type of roundabout is plainly going to be restored. From Easter to Michaelmas, plus a few audacious spasms at Christmas and the New Year, every week-end is to see a host of competitions, large and small; every manufacturer's catalogue and newspaper advertisements will be reduced to smaller and smaller type in order to recount the appalling list of gold medals and fastest times; every ignorant beginner will be increasingly bewildered by the apparently uniform

victories of the best and the worst machines (how can he distinguish between the team prize in the A.C.U. Six Days and the speed-judging competition of the Mudshire M.C.?); every factory will be compelled to waste good men on the weary circuits at legal limit which add another line to the firm's catalogue of medals.

Incidentally, these incessant competitions tend to become injurious all round. They obsess club life and frighten away many desirable members and memberettes. They create in the minds of the general public a maximum impression of speed, noise, and dust. In the bigger trials, the size of the entry is a nuisance to officials, competitors, hotels, and public.

The Remedy.

WE have stagnated for five years, and it goes without saying that we must be allowed to run riot this summer—and perhaps next year as well. But before the season of 1921 at the latest, and preferably during the coming winter, the A.C.U. should take steps to control what threatens to develop into a general nuisance. The remedy is absurdly simple. In the first place, competitions should be classified. A dozen (more or less) events should be hall-marked as first class; for these only should entries be accepted from the trade and from individuals who have won their spurs in minor canterers. If desired, a running score might be kept of all successes in these first-class shows, and at the end of the year the men who deserve most credit would get it. Second-class events would be those of the smaller clubs: trade entries and individual entrants with, say, three golds (exclusive of dates) to their name would be excluded from second-class events, and the novice and the duffer would get a show. Other details could be left to an opportunist policy. For example, fifty entrants are enough for any road event; and that number can be made the limit by a variety of dodges, *e.g.*, setting a stiff entry fee, limiting each make to three representatives, etc.

The Alternative.

AT present we are heading for the kind of Bedlam represented by four big competitions every week-end in one part of the country or another, each with its 100-150 entrants, and some 75% of gold medals. One evil result from the competition rider's own standpoint is already evident—gold medals are as cheap as dirt. There is hardly a solitary motor cycling medal which retains anything like the prestige of the old North Road Cycling Club's "record" golds. Another evil is the fearful waste of time, energy, and money involved. Yet another is the habit evolved by certain firms of swamping poorer rivals by entering their machines in dozens, directly or indirectly. Next year we must prepare for a change. Control of this confusion by a live and democratic A.C.U. will be welcome when the time comes: and we may hope for some rational supervision within two years.

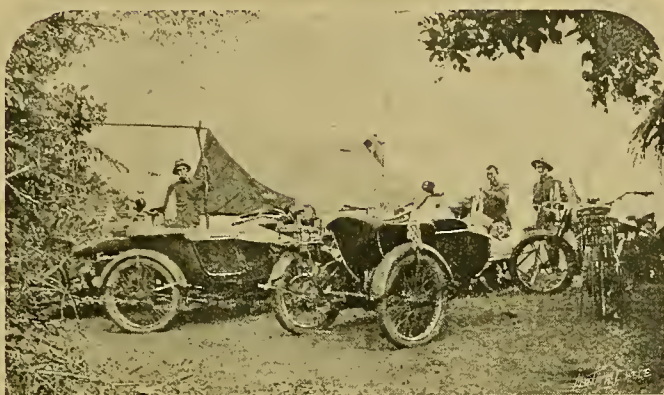
A Big Existing
and Potential
Market in Java.

THE MOTOR CYCLE IN THE EAST INDIES.

900
Motor Cycles
in the Town of
Soerabaya.

OWING to the advantages which the Americans have enjoyed during the war, they have literally turned Java into a market of their own, so far as things motorish are concerned. A glance at the official statistics will give an astonishing idea as to the extent of the growth of the American imports in this part of the world, which development, to a very great measure, is traceable to the big increase of wealth in the island during the war. Now, however, that the war is over, it is most sincerely to be hoped that British manufacturers of motor cycles will make a great effort to find a strong position for their productions in this market. American cars are, of course, everywhere, and perhaps it is not too much to say that American motor cycles are almost as numerous. Indeed, so much progress has been made under almost ideal conditions, that there is scarcely an American machine whose name is not a household word, especially in the bigger towns. The present state of affairs must, I am sure, impress British makers, but even more important is the fact that motor cycling in Java and Sumatra is only in its infancy, and a great boom can surely be expected in the very near future.

This tight little island of Java—to leave out the numerous other Dutch possessions in the Indies—has a population of about thirty millions and no fewer than a million Chinese. The latter own perhaps more wealth, collectively, than any other Oriental race in this country, and practically all the important retailing business is in their hands. Java is generally acknowledged to be one of

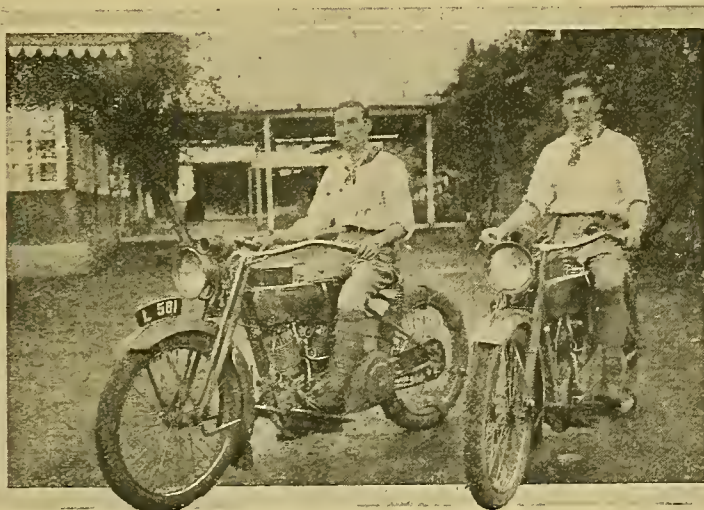


the most fertile countries on the face of the earth, and it is no idle boast to claim that it will soon experience such prosperity as it has never known before, its resources of commodities for export being almost unlimited. An increased prosperity means, of course, that all inhabitants, of whatever race or colour, will have more money to spend, and it is principally to this

coming increase in wealth among the Chinese and better class of native that one must look for the development of the pastime of motor cycling, although, as a matter of fact, the motor cycle is daily growing in popularity with the many thousands of Europeans and Eurasians.

Of much interest to the motor cycle world is the fact that petrol, petroleum, suitable lubricating oils, greases, and other by-products are produced in great volume by the Dortsche Petroleum Company on the spot, so that motor users here are more than independent on the outside world for such necessities. Tyres of every known make in Europe and America have been imported in enormous quantities almost without a break for the last four years. The petroleum company has a very excellent system of distribution

at fixed rates, according to the distance of each depot from the supplying centre, and it must be a very small place indeed in which there is not at least one Chinese dealer ready with whatever a touring motorist might require. It has already been reported in *The Motor Cycle* that the roads in Java are very good, and I can testify that this, broadly speaking, is a fact. True enough, in the more inaccessible mountain places surfaces are anything



Motor cyclists in Java do not require overalls but are able to enjoy the pastime in neat attire.

The Motor Cycle in the East Indies.—

but perfect, but in all my travelling, in East Java at least, I have not yet found a road leading to anywhere interesting that could not be ridden by motor bicycle in more or less comfort.

There, in the blue distance, is Tosari, whose sanatorium is renowned all over the East, 6,000 feet above sea level, the approach to which is a magnificent winding climb of about seventeen miles from the plain—truly a joy to any motor cyclist with a moderate amount of power under his control. Nobody who has not experienced this climb and the subsequent descent can

are getting more and more numerous, but the attire of many of them is inclined to be fantastic. They love to ride slowly about town with their exhaust open and clutch only partly engaged; and, as they almost invariably ride Indians or Harleys, they produce what to them is a very delightful noise.

Looking at the map of the world, it is perhaps difficult to realise that this town of Soerabaya—to take one of the principal towns of Java—boasts about 300,000 inhabitants; but such is the fact. Motor cycling locally is very much to the fore, about 900 machines of all makes being registered in the city. The following table will give an idea of the proportion of the various makes in use:

Top:
A road in Java.

Middle:
A motor cyclists' camp on the south coast of the island.

Bottom:
A "freak" hill-climb over the mountains 6,500 feet high. Near Nongkodjadjar.

Harley-Davidson	...	...	25%
Indian	...	...	20%
Excelsior	...	...	10%
Henderson	...	...	10%
F.N.	...	...	10%
Sunbeam	...	...	2½%
Cleveland lightweight	...	...	5%
Indian lightweight	...	...	5%
Royal Enfield	...	...	5%
Miscellaneous	...	...	7½%

In this country, where the conditions are so ideal for long tours, the big twin is overwhelmingly popular, and 28in. wheels have become so well established that, if British manufacturers wish to get into the trade here, *they will have to cater* for this feature. It goes almost without saying that the quality and reliability of the British machine is well known amongst serious and understanding motor cyclists in this country, most of whom, by the way, are regular readers of *The Motor Cycle*; but

form the remotest idea of the exhilaration of this run, whilst the changing scenery unfolds as one makes the gradual transition from the great heat of the plains to the extreme cold of this fairyland in the clouds is truly gorgeous.

The main roads, taken as a whole, are splendid; and, with the exception of local towns in which there is generally a polite request suspended from the trees, asking motorists to drive slowly, there is no speed-limit. This freedom of the road has perhaps one drawback, inasmuch as it gives road hogs too much latitude, and their frequent "blinding" through intricate slow traffic has done a good deal to bring motor cyclists into disrepute in the eyes of many Europeans here. On the whole, however, the public and the press are quite sympathetic. It is only when a glaring case of recklessness is reported that some control to be exercised against motorists is asked for. Native riders



The Motor Cycle in the East Indies.—

makers at home will have to fall into line and give what is wanted, which is, of course, something to compete in all respects with the best known American machines. I have unfortunately lost touch with what has developed in the English motor cycling world, so, perhaps, after all, some of my remarks are superfluous. I sincerely hope they are! [Most British Colonial models now have 28in. wheels.—ED.]

Although until recently I have been a rider of an American mount, I am looking forward to the time when I shall be in a position to get an English big twin and sidecar; and you may take it for granted that the handful of my fellow countrymen here, who are very keen and have experience of all kinds of mounts, are at one with me in hoping for the ascend-

ancy of the British bicycle in this wonderful country. It is now for the industry at home to make a strenuous bid for these markets, for it goes without saying that the Americans and their friends will not relinquish their present very strong position without a fight.

It might be arranged that a suitable man be chosen to tour the East from Colombo to Shanghai in the interest of the motor cycle trade in general, and so see for himself the peculiar conditions of each big market; the knowledge and business that would result from such a tour would more than repay the outlay. This is the time for combined effort, and I am sure that in all the big towns of this country, at any rate, there are keen Britishers or pro-British Dutchmen who would only be too glad to help such a representative in his mission.

BANYU BIRU.



During H.M. the King's visit to Sheffield last week, more than usual interest was taken in the "march past" of a Motor Machine Gun Battery. These Clyno outfits did fine work on the Western and other, Fronts being specially mentioned in despatches by Field Marshal Sir Douglas Haig.

An Open Trial Amid Welsh Hills.

Liverpool M.C. to run its Whitsuntide Event on Benzole.

THE first important trial to be run on benzole will be held under the auspices of the Liverpool M.C. on Whit-Monday. It is an example which other clubs might well follow in order to encourage the use of home-produced fuel.

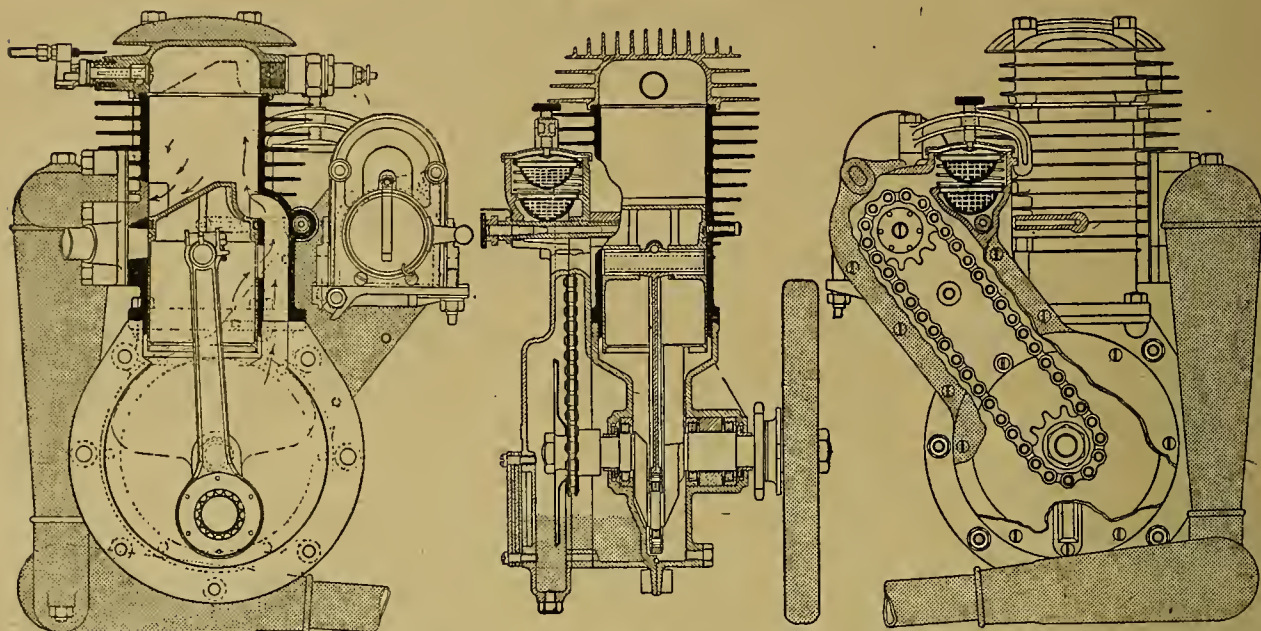
It is anticipated that the trial will attract a good entry, as the course comprises one of the most beautiful tours in North Wales, and the trial finishes early to enable those competitors from other districts than Liverpool to reach home the same night. Many participants in the London-Edinburgh run are expected, and special arrangements are being made to meet the train which leaves Edinburgh at 4.55 p.m. on Saturday and Sunday, arriving in Warrington at 11.11. Here the secretary of the Liverpool Club is arranging for a supply of fuel to be outside the station for the sixteen miles run to Chester, and the garage at the latter place will be open all night. London-Edinburgh

competitors intending to enter the North Wales event should communicate with the secretary, Mr. L. W. Barton, 22, Lord Street, Liverpool.

The trial starts at Hawarden Castle Hotel, Queensferry, at 9 a.m., and embraces Mold, Cilcain, Loggerheads, Ruthin, Cerrig-y-Druoidin, to Bala, where there is a lunch stop of 1½ hours. The return journey is via Pont Newydd Station, Cross Foxes Inn, Dinas Mawddwy, Bwlch-y-Groes, Bala, Llangollen, Old Horseshoe Pass, Llandegla, Coed Talon, Hope, Hawarden, and Queensferry. The total distance is approximately 130 miles. The three non-stop sections are as follows: From Mold via Cilcain to the Loggerheads—about eight miles; from Dinas village to the top of Bwlch-y-Groes—eight miles; and from Llangollen to the top of the Horseshoe Pass—about six miles. First, second, and third class certificates will be awarded. Entries close on Monday next, the 2nd prox.

THE 350 c.c. PRECISION TWO-STROKE.

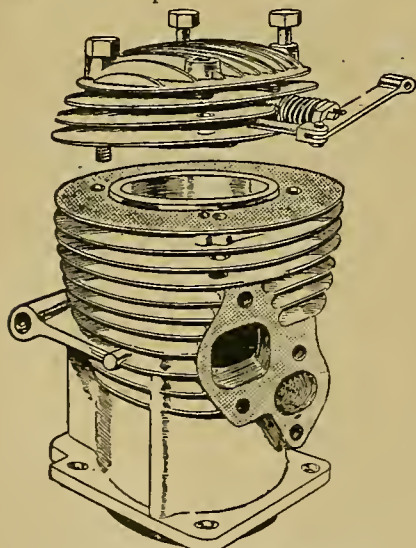
A New Engine with Mechanical Lubrication, Detachable Head, 74 mm. Bore and 81 mm. Stroke.



The new Precision engine in detail: (Left) Part section across the crank case. Note the double ports in the cylinder for the transfer of gas. (Centre) Part section through the crank case, showing the magneto drive chain with disc on the crankshaft, roller bearings, etc. (Right) The magneto chain is utilised to throw oil into the trough through the lower strainer.

THE new Precision two-stroke engine made its *début* in the Sutton Coldfield Trial for the Levis Cup, and its rider was announced as the winner, but, owing to the fact that he failed to produce the sealed envelope explaining the route, he was disqualified.

This, however, does not lessen the merit of the performance.



The cylinder and detachable head of the 350 c.c. Precision two-stroke.

We were at the Precision works a few days previously and tried the new engine, the development of which we have followed with great interest since the days before the signing of the Armistice, when

it existed only on paper. For its capacity, it impressed us as being remarkably efficient, being capable of attaining and maintaining high speeds without the least sign of over-heating.

Although intended solely as the power unit for a solo machine, for demonstration purposes Messrs. F. E. Baker, Ltd., have fitted the engine in a light sidecar machine, and have obtained speeds higher than those of any of the pre-war sidecar machines we have tried. What is more important, however, is the fact that, after an all-out run with sidecar, the engine was no hotter than is an air-cooled engine of the four-stroke type after it has been running for a short time. This demonstrated that the designers have succeeded in making an advance on pre-war design of the three-port two-stroke engine, and no doubt the lubrication contributes in no small degree to the results obtained.

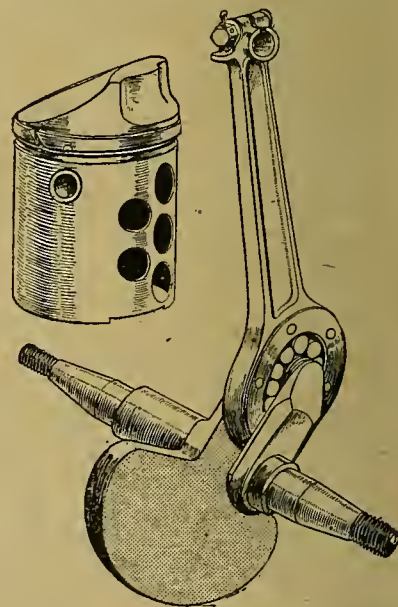
It may be recalled that we described this lubrication system when reviewing the patent specification some time ago.

The Question of Lubrication.

Among two-stroke designers and users it is generally agreed that the question of lubrication has very great bearing upon the efficiency of this type of engine. Too little lubricant causes the engine to over-heat, and too much upsets the mixture and accounts for the four-stroking of many engines, in which the gas is first compressed in the crank case.

In designing the new Precision engine, Messrs. Baker have aimed at providing a continuous supply of oil to the walls of the cylinder always consistent with the speed of the engine. At the same time it was considered undesirable to embody mechanism of a complicated nature. To

obtain the desired results, the designers first of all placed the magneto behind the engine, and approximately level with the cylinder. The magneto drive is by chain, which is utilised to carry oil from



The connecting rod and crankshaft, showing the roller big end and the method of its retention.

a sump on the side of the crank case to a trough at the top of the chain case. Here the oil is filtered, and flows by gravity via a channel at the rear of the cylinder to

The 350 c.c. Precision Two-stroke.—

two passages communicating with the cylinder at two points opposite each other. The piston has an oil groove, which helps to distribute the oil equally around the cylinder.

It may be imagined that the oil thus thrown up and into the trough by the chain would be in the form of a spray. This is not so, however, but a continuous stream of oil is in circulation, so that the trough is always full. The oil which drips from the cylinder walls on one side is taken through a channel to the compression retaining washers on the flywheel side of the crankshaft, while the balance does what little lubrication is necessary at the roller big end and side bearings. The supply is regulated as required by means of a cone valve adjusted by a knurled screw on a dial.

Incorporated with the magneto driving sprocket in the main shaft is a disc which serves to pick up the oil when the level is below that of the underside of the chain, and on the side of the crank case there is a gauge to show the level of lubricant in the sump. So long as oil is visible at all in this gauge, the disc will circulate it, and sufficient oil can be carried for about 300 miles—the consumption being approximately 1,000 miles per quart.

The oil is not used more than once, hence the presence of the two strainers shown in the illustrations requires some explanation. It will be noted that the magneto chain case, which acts as an oil container, is fitted with a large filler cap held in position by a stirrup and knurled screw. The top strainer is used when the supply of oil is replenished, and is kept in position by a light spring. The lower strainer filters the oil that is thrown up into the trough, and is a safeguard against small particles of metal from the sprocket or chain being taken into the engine.

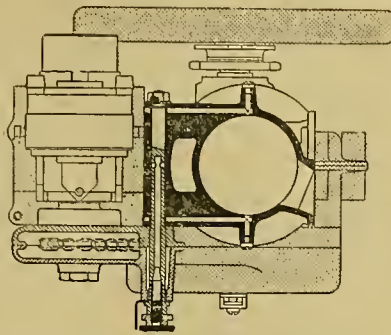
A Detachable Head Adopted.

As will be seen from the accompanying drawings, the new Precision has a detachable head, which is an innovation in two-stroke engine design. This is secured to the main barrel of the cylinder by four long bolts which screw into the cylinder casting. The head is machined, which probably assists in the general efficiency of the engine, as a machined surface does not carbonise so quickly as one which is rough cast. The compression release which is fitted in the head is a comparatively large mushroom valve and operated by a substantial lever and a strong spring which owing to its exposed position is not likely to lose its tension through overheating.

The cylinder has a bore and stroke of 74 mm. and 81 mm. respectively, the capacity being 349 c.c.

Owing to the extremely narrow connecting rod, possible with a roller bearing big end and the design of the crank throws, the capacity of the crank case is kept low, hence the initial compression is fairly high.

Although this engine may be described as being of the three-port type, there are actually four ports in the cylinder. At the front there are the exhaust and inlet ports, and at the rear two transfer ports. Through one of the latter the mixture from within the piston passes into the



Plan view through cylinder showing the oil channels and the valve for regulating the supply.

transfer passage *via* one of the holes which are drilled in the rear side of the piston to balance it. This assists in cooling the piston.

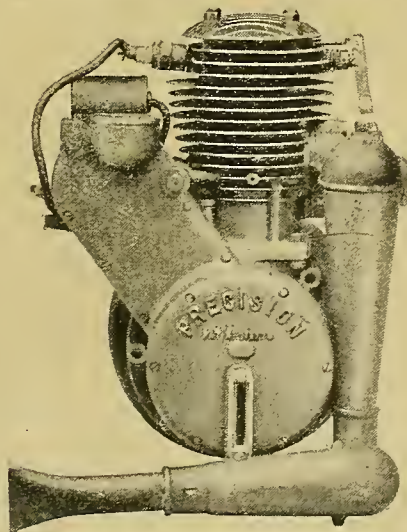
A Well-designed Piston.

The piston has one ring only, which is of the conventional type with diagonal cut, and is pegged to prevent its turning in its groove. The top of the piston is designed to turn the flow of the incoming gas in a vertical direction in an easy sweep without loss of gas direct to the exhaust port. The accompanying drawing shows the rather unusual shape of the deflector. On the "roof" of the piston there are several webs which increase the area for cooling purposes and permit of light construction.

Phosphor bronze bushes are fitted in the piston bosses, in which the gudgeon pin oscillates. The latter is secured to the small end of the connecting rod—another reversal of usual two-stroke practice, and a feature which provides exceptionally large bearing surface.

As mentioned previously, the "big end" is fitted with a roller bearing. This consists of sixteen rollers retained by two hardened plates, which are riveted on to the connecting rod, the whole being a very neat and light assembly.

Roller bearings are used also to support the main shaft, two rows of rollers on



The new 350 c.c. Precision two-stroke engine.

the flywheel side, and one on the magneto drive side.

On both sides compression retaining washers are fitted, which consist of hardened bushes and slightly dished spring steel washers. In addition, felt washers are inserted between the bushes and the ends of the bearing housings.

Quite an interesting feature of the engine is the method of connecting up the magneto. This probably necessitated more thinking out than any other part of the design. A moment's consideration will show that a constant flow of oil over the magneto sprocket on the one hand, and the necessity to prevent oil reaching the magneto on the other, combined to create a problem difficult of solution, if accessibility and simplicity were to be retained.

Magneto Coupling.

A large boss is provided in the back of the chain case, and in this a long bearing is fitted and provided with ample means of lubrication. The chain sprocket is fitted with a long sleeve which revolves in the bearing, and within the former is another sleeve, having at its outer end a flange containing a taper hole to take the tapered shaft of the magneto. The coupling between the two is by a simple form of dog clutch, and as the two sleeves are not in contact no strain is placed upon the armature shaft, the coupling being self-aligning, as it were.

A screw plug in the outer case gives access to the screw, which secures the magneto shaft to the flanged sleeve; by turning this screw the flange and taper shaft separate, thus facilitating magneto adjustment, while when it is desired to remove the magneto altogether it is only necessary to loosen one nut, which slackens the strap holding the magneto, when the unit may be withdrawn.

Adjustment of the magneto chain is obtained by the sliding plate, which embodies the magneto platform and the bearing for the sprocket sleeve.

The exhaust pipe is of rather unusual shape, and is perhaps better described as two expansion chambers. The vertical portion consists of castings top and bottom connected by a conical tube with the smaller diameter at the bottom. This permits a rapid expansion of the exhaust gases as they leave the cylinder. A second chamber on similar lines is connected at right angles to the lower end of the vertical chamber, the exhaust pipe extension being fitted in the former.

Although no baffles are embodied, the exhaust is not unduly loud, but, should it be found desirable, a baffle could be installed in either of the chambers.

To summarise, the new Precision engine strikes us as being a most interesting power unit to which has been devoted a considerable amount of thought and time. It has been designed as a power unit for a solo machine—a type of motor cycle quite distinct from the lightweight and the average "3½" which has been developed as a dual-purpose mount.

At the present time there are too few machines in this class for the solo rider who requires something more than a 2½ h.p. lightweight and a mount of lighter weight than the dual-purpose "3½," and no doubt there is a future for a 350 c.c. two-stroke of the Precision type if it is built into a frame suitable for its power.



A Commentary based upon Practical Experience and a Study of Overseas Opinions.

Paving the Way.

OVER six months have elapsed since the first Armistice, and each week that slips by more and more accentuates the difficult position in which the British makers of motor cycles find themselves. High prices of materials and labour difficulties, together with a scarcity of many of the vital essentials, combine to retard and restrict output, with the obvious result that those of their foreign competitors, who have not so suffered from the effects of the lengthy period of disorganisation and diversion from their ordinary business routine, are taking steps to secure Overseas trade by establishing business centres and organisations in likely countries. The temporary expedient of restricted imports and a tariff have eased the internal situation somewhat, from the makers' point of view, but pity the poor rider!

Although the action of the Swedish Government in placing a temporary embargo on further imports of American machines into that country is indicative of the great activity now proceeding, the immediate establishment by the United States of central business bureaux will give them a precedence that will not be easily regained by the British manufacturers, who have still a long way to go before they get their own house in order.

The first important step has been taken by this country in the despatching of a trade commissioner to study the trade conditions in all parts of the world; and, by the time his reports are complete, the motor cycle industry here will most probably be ready to cope with the Overseas demands. In the meantime, the greatest energy is necessary to prepare the way for trade in previously untapped areas by the establishment of permanent commissioners appointed by the representative body of the trade as a whole.



Brakes.

THE question of brakes is a very important one to all motor cyclists, but perhaps even more important to the Overseas rider than to the man at home. Obviously it is best from a theoretical point of view that all wheels should be braked, as this gives the greatest possible retarding effects, and, moreover, does not throw all the work on one wheel and tyre. In practice there are difficulties in the way of this highly desirable consummation, but only those difficulties which, in our opinion, can be overcome when proper attention is given to the subject. We recently touched upon some of the pitfalls which lie in wait for the designer of a sidecar brake. It is very necessary that if a sidecar brake be fitted it should be so arranged that it is impossible to

apply a greater retarding force to the sidecar wheel than to the wheels of the motor cycle to which it is attached. A sidecar brake, then, should be compensated and connected to the rear wheel brake in such a manner that it is applied with greater force to the bicycle wheel than to the wheel of the sidecar. If the reverse were the case the drag of the sidecar might pull the whole outfit round, and disaster might follow.

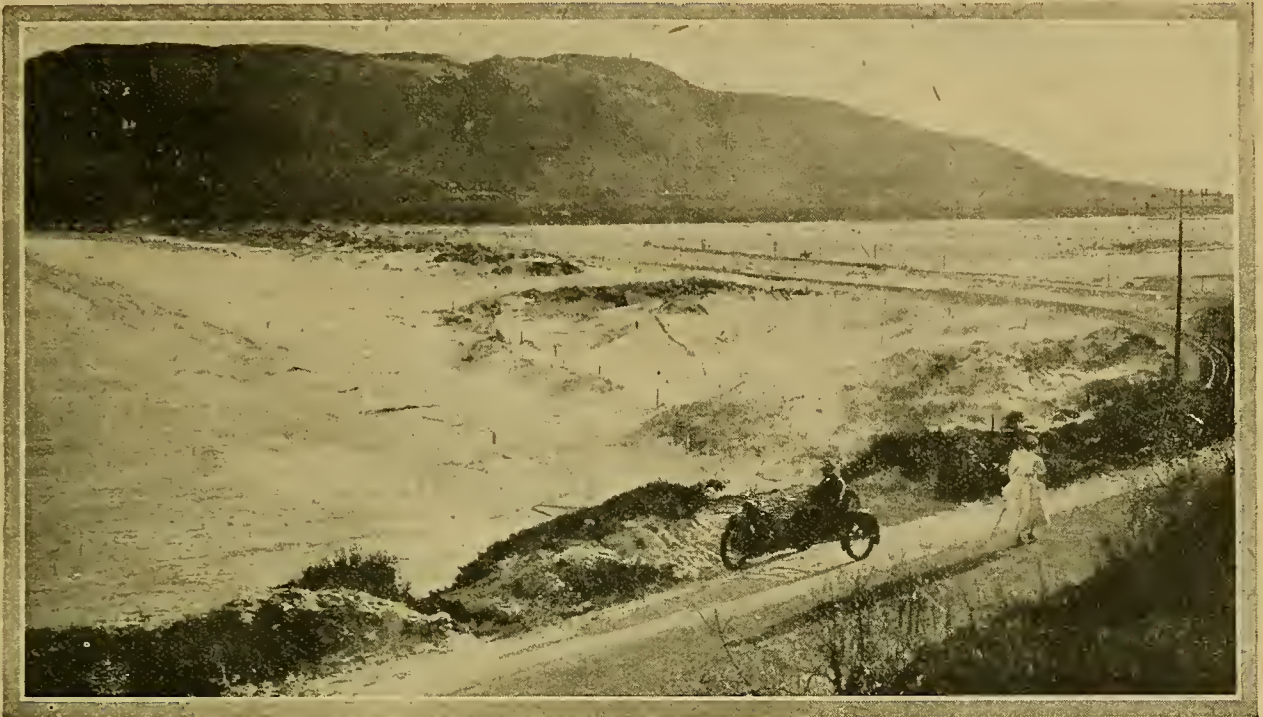
At the present time motor cycle front wheel brakes have a bad reputation generally, though it must be admitted that there are several good examples to be seen on the road. This has come about from the too slavish copying of cycle practice. What is good enough for a cycle may be inadequate in the case of a motor cycle on account of its greater weight and speed. The problem is not, however, impossible of solution. That a rider should habitually ignore his front brake, or worse still remove it, is a reflection upon the ability of the motor cycle designer, just as to fit two brakes to a rear wheel (a too common practice) is tantamount to a confession of incapacity to design a satisfactory front brake. Some firms are, we know, giving consideration to this important detail, but we fear that others are not, and therefore we have not yet seen the last of the front brake upon the tyre rim, which makes its presence felt most acutely when it becomes necessary to remove the front wheel for tyre repairs.



Wanted, a Smaller and Lighter Colonial Model.

ANYONE examining the modern Colonial model motor cycle must be left with an impression that manufacturers apparently consider all Overseas buyers are tall riders. With the increased ground clearances and larger wheels, which are now features of most new models, the saddle height has increased also; and, although the majority of these machines will be found quite as suitable for solo riding as the foreign-built machines which have been developed by the solo rider's needs, design in the larger class has not reached that stage when the comparatively short rider can sit astride a big twin with his feet comfortably on the ground.

This, of course, applies to all riders, at home and abroad, but it is a question which affects the Overseas buyer more because big twins are more often used abroad as solo mounts. Hence there appears to be a vacancy to be filled in the field of motor cycles by a machine designed exclusively for the short-legged motor cyclist, which would be lighter than, but still as powerful as, the modern big twin.



A New Hudson sidecar outfit on the coast road near Capetown. In this district the roads are good, and motor cycles are now seen in greatly increasing numbers.

A Selection of Letters from Readers scattered all over the World.

Motor Cycles for the Argentine.

"BRITISHER," writing from Buenos Ayres, emphasises the possibilities for the British-made machines and sidecars in South America.

"Having been a keen motor cyclist for some years I am deeply interested in the manufacture and sale of machines. The Argentine at present is almost entirely supplied by the United States. There is a wonderful field open here for the British manufacturer in this line alone, provided he is far-seeing enough to produce a machine the country requires, and is prepared to compete with the American firms; if not, the Yankees, with their usual enterprise, will have all the trade. There is also a very good opening for strong coachbuilt sidecars, as the sidecar combination seems to be getting very popular in these parts. I think the single-cylinder machines, like the Sunbeam, P. and M., etc., would do very well here, but I do not recommend belt-driven machines for this country. Also, machines like the Matchless and A.J.S. would do well here for sidecar work. I do hope our manufacturers will make a big effort now, and before it is too late, otherwise the Americans will, I fear, have all the trade."

An Ideal Specification for India.

An ideal specification for India is given by MR. J. W. BENNETT of the Indian Police:

"As an interested reader of your journal and a motor cyclist of some experience in India, I feel justified in making a few remarks regarding the kind of motor cycle required for Colonial use, especially at such a time as this when 'Reconstruction' is thrust so prominently before our eyes.

"During the last five years I have owned no fewer than five different machines of English make, viz., a $3\frac{1}{2}$ h.p. single-speed Triumph, a 3 h.p. twin two-speed Royal Enfield, a $3\frac{1}{2}$ h.p. three-speed countershaft Rover, a $3\frac{1}{2}$ h.p. single-speed New Hudson, and a $3\frac{1}{2}$ h.p. twin hub three-speed Matchless.

"Now, on an English road, or on an Indian road, which can stand comparison with the former, all these machines are excellent. But good roads are the exception, and not the rule, in India; so our motor cycle must be built to stand good and bad alike, and on bad roads we must have something sprung front and rear. (For that matter, all machines

should be of this type, whatever road it is intended to traverse.) I do not profess to be an authority on springing; that is left to the manufacturers. But the springs must be prepared to stand plenty of strain, and at the same time have lots of flexibility.

"Our next consideration is lack of bridges. We must just take a water-splash in our stride. Now, a belt or chain-cum-belt drive is all right up to a limit, and it is reached when it comes to a case of water. It is essential to have either an enclosed chain drive or shaft drive. Moreover, both in the case of water and bumpy roads we must have high crank case clearance. The English motor cycle has the same fault as the English motor car, so far as Colonial use is concerned—there is not enough ground clearance. We also want the magneto perched high on the frame to prevent the admission of water.

"Now, to consider loose and hilly surfaces. Large wheels and tyres (28in. x 3in.) are essential, as they tend to prevent skidding. I am glad to see that hub gears have died a natural death. So give us a really good three-speed countershaft gear and clutch. The clutch should be foot operated. I am not in favour of hand-controlled clutches. Bowden wires are all right in their way, but they can make themselves very disagreeable at times, especially when they snap somewhere in the middle.

"It is seldom an average speed of 20 m.p.h. is attained for a long stretch. The usual performance is far short of that. Bumpy roads, pot-hole roads, and bullock carts and cattle which refuse to move out of the way, prevent a good average. Hence, the amount of 'tap twiddling' necessary is enormous; nay, more, it is highly inconvenient. When the road persists in jerking you off the saddle into mid-air you want all your ten fingers to grasp the handle-bars the more tightly. In my opinion, the American system of grip control is superior to our method.

"It is a well-known fact that no motor cycle has yet been equipped with a really efficient mudguarding system. Well, most of us are fairly used to getting a bit splashed, and by means of weird and wonderful disguises manage to keep the inner layer of clothes fairly clean. So let that pass for the time being. My argument is that there should be more clearance between the tyre and the mudguard. More than

Overseas Sect.on.—

once—many times, in fact—when travelling over a road where the mud is specially glutinous, I have been absolutely stopped dead because the mud, having filled the space between the tyre and the mudguard, had completely jammed both wheels. And how difficult it was to scrape out the mud when the clearance is only one inch! This also points, I think, to the moral that both front and back mudguards should be very easy of removal—off with a few nuts, and both should be free to be taken out without further trouble.

"In India garages do *not* abound. Except in the big towns, such as we hear about in the geography books at school, they are an unknown quantity. So when we go out for a run of, say, 150 miles, we must prepare for the worst, and carry every spanner, spare part, belt (or chain), inner and outer tubes, puncture outfit, etc.—in fact, anything we may want *en route*. Now, sir, how is it possible to carry all these articles in the average motor cycle toolbag? To waste no words, it is an utter impossibility. We cannot—in fact, do not—rely on the stock-in-trade of a passing motor cyclist to supply our wants in case of a breakdown, for we know that in all our journeys we shall never—or very, very seldom—see such a phenomenon. So our requirement is a really capacious toolbag—two, if you like, so long as they accommodate all the necessary jimjams. And they should be fitted to the side of the carrier. We want the top to carry our tiffin basket. There are no inns, hotels, or half-way houses out here—in fact, no means of procuring anything except milk and bananas. So we must just carry a small meal, with a minimum of crockery and cutlery. We must have a large tank, capable of holding at least two gallons of petrol and half a gallon of oil, roomy and comfortably inclined footboards, a large saddle, with, I think, a respectable back rest, something on which to lean without getting a pain in the small of the back, and efficient lubricating system, more or less foolproof, so that there is no fear either of caking one's plug with oil or causing the engine to seize, which requires no attention beyond a periodical filling with oil and the turning of a tap, which allows a sufficient quantity to oil all bearings, and no more."

Tropical Conditions.

Mr. G. W. NOTLEY, of Neboda, Ceylon, gives a reminder to magneto manufacturers and all who cater for motor cycle trade in the hot countries. He says:

"I have been very interested in the articles on drives and positions of magnetos—especially the latter.

"Several of the designers seem to have completely forgotten the conditions of the tropics. A very common trouble out here with magnetos is for the shellac (or whatever the insulating substance is) to run out when the whole power unit has become heated after a long climb or long run, and when the magneto has cooled down the armature becomes solid with the magnets. There is one type of magneto which does not suffer from this trouble, but is often known to lose

its magnetism. Cars are troubled in this way as well as motor cycles. Of course, it is essential that the magneto be protected from the wet as far as possible, as tropical rains are noted for the way they come down in 'bucketfuls.'

"When are British makers going to send out some of their machines? The only British bicycle on the market at present seems to be the B.S.A., which, by the way, does remarkably well, and stands an enormous lot of knocking about. American machines are very popular, or, at any rate, are very much in use, because they seem to be the only high powered outfits obtainable at present. I am longing to see British machines take their proper places in Ceylon.

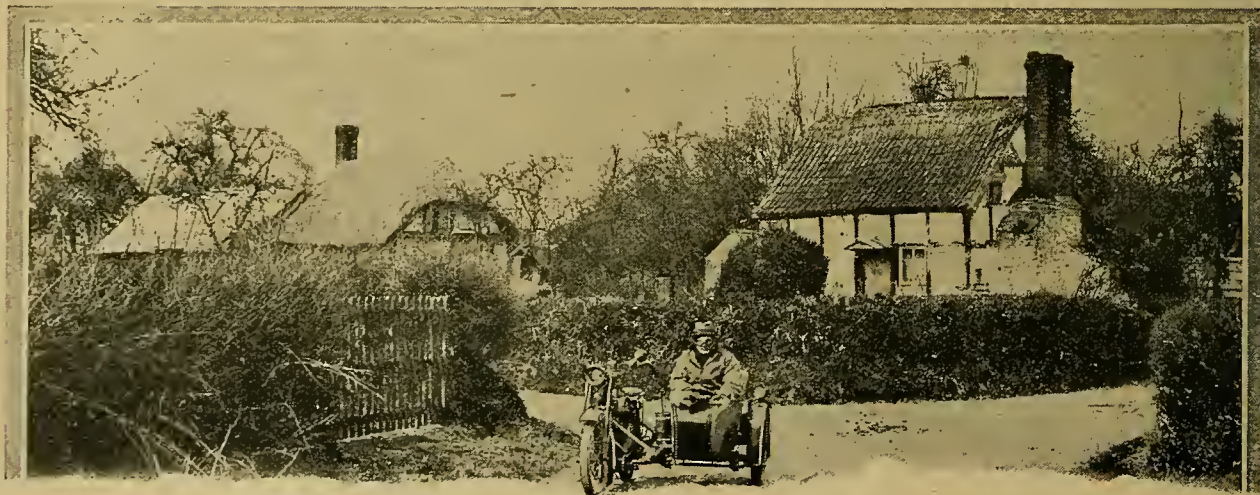
"I have noticed Rev. Walmsley's remarks from time to time on twist controls and the danger of levers. I have found the latter very satisfactory and prefer them to the American controls any day. I might add that I have used both, but suppose we all like the controls we are used to."

A British Single in Canada.

Replying to a letter from Canada in our issue of March 27th, Mr. W. GREENWOOD, of the Tangent Cycle Co., Toronto, points out that the $3\frac{1}{2}$ h.p. Triumph is quite equal to the abnormal conditions with which it has to contend in that country: "I cannot pass over Mr. Warne's letter in your issue of March 27th without comment. The machine mentioned is one I used in 1914. Having the cylinder plated is a doubtful improvement. As he removed the pedals and chain, and attached another pair of footrests, some difficulty must have arisen when he had to start the engine, in a foot of sand, against a strong wind. Drilling a hole near the base of the crank case is another brilliant idea. What makes the idea more amusing is that the Triumph Co. had a similar arrangement in their 1913 models, the result being that after the machines had been run a few hundred miles the big end bushes were ruined by the sand that got into the bearings; and the Triumph Co. sent us a number of connecting rods and bushes to replace the ruined ones, and also some brass plugs to stop up the holes in the tubes. Perhaps Mr. Warne got his idea from the Triumph, and simply removed the brass plug from the tube.

"Packing waste *inside* the valve springs is novel, and 125 miles to a gallon of petrol is very good; I could only get 90 miles. Perhaps he should have said a *thankful*.

"Now Mr. Warne says 8 h.p. is required for serious touring, but I must call his attention to the fact that the Triumph 1912 clutch model holds the record around Lake Simcoe, Toronto and return—181 miles. The writer was in the sidecar on the record run. The time was 11 $\frac{1}{2}$ h., including all stoppages—one of $\frac{1}{2}$ h. at Barrie for lunch, another at Bond Lake of 40m. for broken head lug and front wheel axle. The road from Toronto has a rise of 1,200 feet to Bond Lake, then a drop of 500 feet to Sutton, fifty-five miles from Toronto. This distance was done in 2h. 40m., over rough roads. This road has since been improved with a Tarmac surface. Why should 8 h.p. be necessary when a clutch model $3\frac{1}{2}$ h.p. is enough for a trip like this?"



A Matchless sidecar in a picturesque Hereford village. On motoring past these old-world cottages the inevitable remark on their quaintness is always forthcoming, but their internal arrangements are, in the majority of cases, none too impressive.

SCOOTER DEVELOPMENTS.

THE Motor Cycle policy in regard to scooters is well known. We have openly stated our conviction that it will eventually develop into a miniature motor bicycle—the genuine lightweight we have sought for years past. Our query, oft repeated, “Why stand?” has remained unanswered. Surely the person who would prefer to stand on a motor-propelled platform when he or she might well adopt a comfortably seated position and progress at comparative leisure is a rarity. We have made these remarks before, since the answer to our simple question admitted of but one answer. Apart from this, we welcomed the advent of the original motor scooters, since it was clear that they would perform important missionary work by attracting to the ranks push cyclists who have hitherto regarded motor cycles as too heavy.

The natural development which we foresaw and forecasted in these columns is happening. The scooter we are about to describe can more correctly be described as a miniature motor bicycle—the genuine lightweight, in fact. It has a pan seat, an open frame permitting a coat or mackintosh to be worn by the rider, petrol capacity to give it a range of action far beyond that of the original toy scooters, and its road performances more nearly approach the lightweight motor cycle, though obviously, in the absence of a change speed gear—which may or may not represent a possibility of the future—its hill-climbing or, alternatively, its speed capabilities, are limited by the gear ratio adopted.

For some time past a considerable amount of experimental work has been carried out in the evolution of a practicable scooter by Messrs. A.B.C. Motors, Ltd., which has now reached fruition, and the new design should be ready for sale in about a month's time. Viewed through the eyes of the average motor cyclist, the A.B.C. (properly known as the A.B.C. “Skootamota”) is an extraordinarily diminutive and compact bicycle, yet directly one takes the saddle and assumes control of the machine an impression is immediately evident that it is built for ease of handling and the utmost simplicity of control.

As seen in the illustrations, the frame is of the open type, and

The Latest A.B.C. “Skootamota” provided with a Pan Seat, and now forming a Step between the Scooter Proper and the Lightweight Motor Cycle.



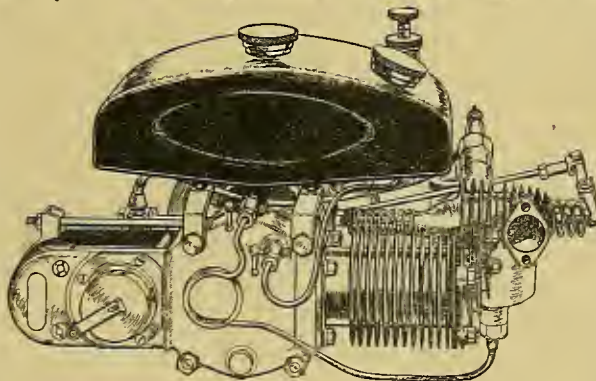
An idea of the size of the A.B.C. “Skootamota” is conveyed by the photograph shown above. Incidentally, it confirms our contentions that the scooter is the ultra lightweight in embryo, for it embodies nothing which is not more or less motor cycle practice.

built up of light steel tubing with welded joints, and, owing to the fact that the centre portion of the frame is dropped to a very low point, it has been possible to provide a large open space in the centre of the machine so that any tangling of dress in the case of lady riders is entirely avoided, whilst at the same time there is plenty of foot room. The frame is built up of four longitudinal tubes attached at the front to the steering head and to the triangular framework at the rear of the machine, which is built over the rear wheel and supports the power unit and pillar for the pan seat. In the centre of the frame of the scooter are three

held to the crank case by four nuts.

A single-throw crankshaft with one web and balance weight is mounted in ball bearings inside the miniature crank case, and the big end provided with a roller type bearing. The piston is of cast iron, having two rings of the same material above the gudgeon pin. On the opposite side to the cylinder a small C.A.V. magneto is secured to the crank case by means of a clamp and long bolt, and is driven by a train of gear wheels from the crankshaft in a housing cast at the side of the crank chamber. The camshaft for operating the valves is mounted in ball bearings above the

crankshaft as shown in the sketch, and also carries a sprocket by which the drive is taken to the rear wheel with an enclosed $\frac{1}{2}$ in. \times $\frac{3}{8}$ in. roller chain, the gear ratio being 10 to 1. A small steel flywheel is keyed on the outer end of the crankshaft outside the crank case, and is also enclosed. A little single-lever automatic carburettor is fitted to the engine in an open and accessible position, and is supplied with petrol from a small tank mounted on brackets above the crank case, the feed of petrol being by gravity. Inside the tank there is a separate compartment for lubricating oil; a hand pump is fitted in this compartment by which lubricant is forced through a pipe directly to the crank case as occasion requires. The exhaust gases are taken through a short length of piping



The complete power unit of the A.B.C. scooter, showing the neat arrangement of the magneto and combined petrol and oil tank above the crank chamber. An important item is that the cylinder head complete with inlet and exhaust valve assembly is detachable from the cylinder for overhauling purposes.

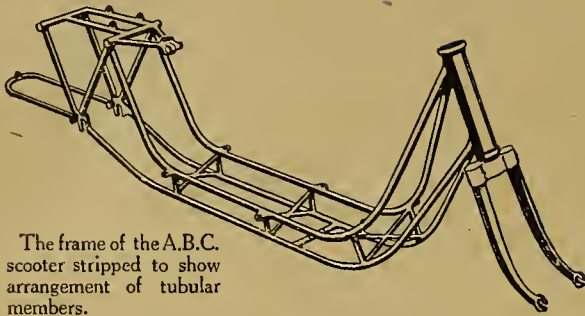
shallow X-shaped cross members made of light steel tubing, which stiffen the middle section of the framework and give additional stability in the main frame assembly.

The Power Unit.

The engine has a single horizontal cylinder with a bore of 60 mm. and stroke of 44 mm. (125 c.c. capacity), and, although only rated at $1\frac{1}{2}$ h.p., the engine is easily capable of giving $2\frac{1}{2}$ h.p. under normal conditions. The cylinder head is detachable complete with the valves, which are mounted opposite to each other in the cylinder head casting, the exhaust valve being overhead for cooling purposes.

Following A.B.C. practice, the cylinder is made of steel and turned from the solid, a flange being provided at the base so that the cylinder can be

Scooter Developments.—



The frame of the A.B.C. scooter stripped to show arrangement of tubular members.

to a small silencer mounted just above the tail of the rear mudguard.

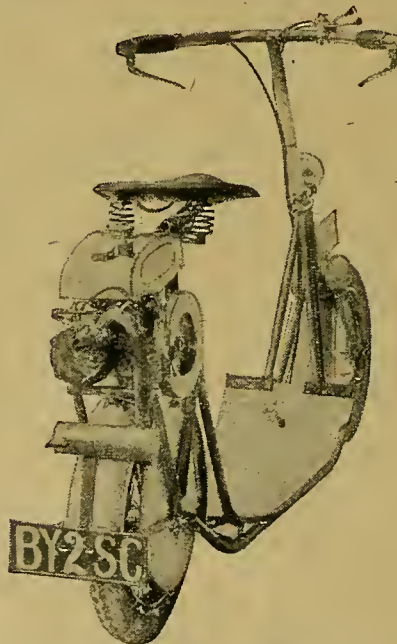
Bicycle Parts.

The steering head and front forks of this little machine follow ordinary bicycle practice in construction, with the exception that the forks themselves are very short in length, while the 16in. wire wheels are shod with 2 $\frac{3}{4}$ in. tyres. Two contracting band brakes are fitted as standard, the rear brake being operated by a pedal in the front part of the foot-board, whilst that in front is controlled by a grip lever on the right handle-bar. In order to give additional comfort a special pan saddle of extra width is employed, and rubber shock absorbers are fitted under the footboard on the main frame. There are also rubber supports at the front end of the board.

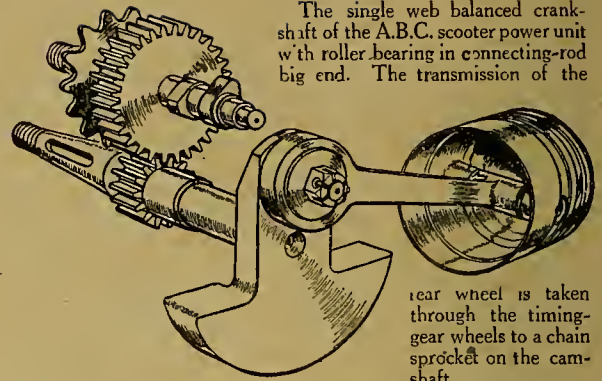
General Utility.

In taking a trial run with this miniature motor bicycle (for in effect it is no other) we were pleased with the manner in which the machine could be used and controlled. It should make a distinct appeal for short journeys and general town runabout purposes, where constant stopping and starting are necessary. We found the machine comfortable to ride and able to ascend the moderate hills in the locality in which our test was made with no signs of overheating. Owing to the small overall dimensions it is possible to ride the machine through narrow spaces in comfort at three miles per hour where it would be unsafe to pilot an ordinary motor bicycle, and a great

point in its favour is that it requires little effort to start while in the saddle, merely a single push of the foot being necessary.



Rear of the A.B.C. "Skootamota." It will be noticed that our query, "Why stand?" is answered in Mr. G. Bradshaw's design.



The single web balanced crankshaft of the A.B.C. scooter power unit with roller bearing in connecting-rod big end. The transmission of the

rear wheel is taken through the timing-gear wheels to a chain sprocket on the camshaft.

The ease of control, in conjunction with its open frame, low weight and build, suggests possible developments for this type of machine for messenger service and parcels delivery.

This, the newest of the many A.B.C. productions, can also be used with success in journeys of some length, such as from outlying farms into neighbouring towns, largely for the reason that the rider is seated on a comfortable pan saddle instead of remaining in the standing position; it is suitable for narrow lanes, it climbs hills comfortably, and the petrol tank will hold sufficient fuel for a run of fifty miles.

A Comprehensive Equipment.

It is possible to traverse a circle of 9ft. diameter with ease, while the engine is throttled down, and since the maximum speed of this scooter is about twenty miles an hour it is possible to accomplish ten miles an hour with reasonable comfort for journeys of moderate length. As the machine only weighs 60 lb., and is compact and easy to handle, an attractive point is that it can be stored away in any handy place in a house or shed, and is ready for use at a moment's notice.

The price of this smallest of all motor cycles, known as the A.B.C. "Skootamota," is £40, which covers the registration fee, and equipment comprising horn, tools, number-plates, electric head and tail lamps with battery. The sole rights of manufacture and distribution are held by Messrs. Gilbert Campling, Ltd., 1, Albemarle Street, Piccadilly, London, W.1.

ANOTHER SCOOTER—"THE MOBILE PUP," WITH AN ENGINE HAVING OVERHEAD VALVES.

WHETHER the scooter secures a permanent place in the world of automobiles or not, there is no doubt about the interest displayed by the public and the readiness of manufacturers to meet what promises to be a brisk immediate demand. Already there are at least three propositions on the market and being advertised, and several other embryo designs are being experimented with by private designers and by firms genuinely interested in the new type of vehicle.

The latest addition to the ranks of scooter manufacturers is Mr. E. O. Stafford, who will shortly introduce the Mobile Pup, the design of which, it is

claimed, is based upon actual road experience.

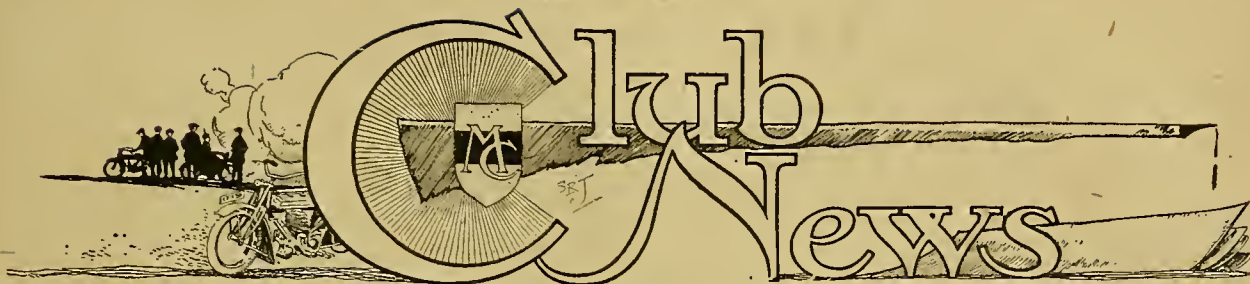
A small four-stroke engine, with mechanically-operated overhead valves and detachable head, is to provide the power. The cylinder has a bore of 55 mm. and 60 mm. stroke, the capacity being 142 c.c. A flywheel type magneto will provide both ignition and lighting current, and a single lever carburettor is among its other features.

No clutch is fitted, as the designers consider such a fitment is dangerous with this type of vehicle. The drive is through a shock absorber through gears to the front wheel, the gear ratio being 5 $\frac{1}{2}$ to 1. With 18x2 $\frac{1}{4}$ in. Palmer cord tyres, it

cannot be said that this new scooter is under-shod. Steel disc wheels are fitted.

The control is by twist grip and exhaust valve lifter, and to facilitate storage the steering column folds after the manner of the Auto-ped. Brakes of the internal expanding type and deeply valanced mudguards are included in the specification. The standard finish is grey.

We understand deliveries are to commence in six weeks' time, and that the price for the first five hundred machines is to be £25 each. We hope to avail ourselves of an offer to test the scooter in a short time, when further details of its mechanism will be given in *The Motor Cycle*.

**North Cheshire M.C.C.**

Members, ex-members, and other motor cyclists in the Wilmslow district, who are interested in reviving the above club should communicate with Capt. J. Oliver, at "Netherfield," Wilmslow.

Northamptonshire M.C.C.

The above club intends holding an open hill-climb at Doddington Hill, near Earls Barton, Northamptonshire, to-day (May 29th). There will be three prizes in each event. Hon. sec., Mr. J. B. Sneath, 3, York Road, Northampton.

Streatham and District M.C.C.

A members' speed-judging competition will be held on Saturday next, the 31st, when two classes will be run if sufficient entries are received: (a) Motor cycles (including sidacar combinations); (b) cars (including cycle cars). Members start from the Clayton Arms, Godstone, at 3.30.

Newcastle and District M.C.

A week-end run to the Lake District for the Whitsuntide holidays is being promoted by the Newcastle and District Motor Club. Members and friends will assemble at the Herd's House, North Terrace, at 2 p.m. on the Saturday, and will reassemble at the Queen's Hotel, Keswick, at 7 p.m. The hon. sec., Mr. W. R. Lister, 2, St. Nicholas Buildings, Newcastle, will be glad to arrange hotel accommodation for anyone desiring to participate. It is proposed to return from Keswick after luncheon on Whit-Monday.

Woolwich, Plumstead, and District M.C.

Arrangements have been made for an inter-club picnic run by members of the Woolwich, Plumstead and District Motor Club, the Streatham and District Motor Club, and the Rochester, Chatham and District Motor Club. The meet will take place at the Rose and Crown, Green Street Green, Orpington, Kent, on Sunday, June 29th, at eleven o'clock. The run will be a tour of the Kentish hills. The picnic will take place on the top of one of the hills about half-way through the run. Clubs interested in inter-club runs, or who intend to take part in the S.E. Counties inter-team trial on August 16th over a sixty-mile course in Kent, will be welcomed.

Further particulars of the picnic and trial may be obtained from the hon. sec. of the Woolwich Club, Mr. F. J. Ellis, 3, Nightingale Place, Woolwich, S.E.18.

Result of the Woolwich Club's recent team trial to Hastings and back: Gold medal winners—O. Breen (Matchless), Petersen (Metz), G. Sims (Douglas), T. Ross (Triumph), Miss Gray (Matchless), W. Whitaker (car), and F. J. Ellis (Matchless).

Future Events.

MAY 29.—NORTHAMPTONSHIRE M.C.C. OPEN HILL-CLIMB.
May 29.—Taunton and District M.C.C. Opening Run to Sidmouth.
MAY 31.—BIRMINGHAM M.C.C. RELIABILITY TRIAL.
May 31.—Finsbury Park C. and M.C. Re-union and Garden Party.
May 31.—N.M.C.F.U., Sheffield. Run to Edwinstowe.
May 31.—Middlesbrough and District M.C.C. Hill-climb.
May 31.—Streatham and District M.C.C. Speed Judging Competition.
May 31.—Wolverhampton M.C.C. Week-end Run to Llangollen.
JUNE 1.—HARROGATE AND DISTRICT M.C. RELIABILITY TRIAL.
June 1.—Carlisle C. and M.C.C. Run to Newland's Corner.
June 1.—Halifax M.C.C. Run to Kirkby Lonsdale.
June 1.—Essex M.C.C. Picnic Run to Maldon.
June 1.—Rochester, Chatham, and District M.C. Run to Hawkhurst.
June 1.—Oldham and District M.C. Run to White-well.
June 3.—Oldham and District M.C. Hill-climb.
June 4.—Middlesbrough and District M.C.C. Run to Durham.
June 6.—Essex Motor Club. Midnight Ride to Yarmouth.
JUNE 6-7.—M.C.C. LONDON-EDINBURGH RUN.
June 7.—Woolwich, Plumstead, and District M.C. Run to Green Street Green.
JUNE 7-9.—BIRMINGHAM M.C.C. TRIAL TO LAND'S END.
June 8.—Woolwich, Plumstead, and District M.C. Run to Charing.
JUNE 9.—COCK AND DISTRICT M.C.C. TWENTY-FOUR HOUR RELIABILITY TRIAL.
JUNE 9.—LIVERPOOL M.C. OPEN RELIABILITY TRIAL.
June 9.—Manchester M.C. Gymkhana.
June 11.—Wolverhampton M.C.C. Run to Wellington Wrekin.
June 15.—Essex M.C. Run to Southend.
June 15.—North Derbyshire M.C.C. Run to Ashbourne.
JUNE 21.—JUNIOR CAR CLUB. HILL-CLIMB AT SOUTH HARTING.
June 21.—Oldham and District M.C. Hill-climb.
June 21.—Woolwich, Plumstead, and District M.C. Run to Maidstone.
June 22.—Birmingham M.C.C. Picnic Tour.
June 22.—Essex M.C. Run to Harlow.
June 22.—Manchester M.C. Inter-club Run with Liverpool M.C.
June 22.—Wolverhampton M.C.C. Run to Rudyard Lake, Derbyshire.
JUNE 25.—ESSEX MOTOR CLUB. SPEED TRIALS AT SOUTHEAST.
June 25.—Birmingham M.C.C. Speed Trials.
JUNE 28.—LIVERPOOL M.C. TWENTY-FOUR HOUR TRIAL TO EDINBURGH.
JUNE 28.—MIDLAND C. AND A.C. RELIABILITY TRIAL.
June 29.—Essex M.C. Run to Dunstable Downs.
June 29.—North Derbyshire M.C.C. Run to Derwent Valley.
June 29.—Wolverhampton M.C.C. (Ladies' Day). Run to Gourd Lodge Inn.
JULY 1 AND 2.—ARETHNOT TROPHY TWO DAYS TRIAL. PLYMOUTH DISTRICT.
JULY 5.—WOLVERHAMPTON M.C.C. OPEN TRIAL.
JULY 6.—OLDHAM AND DISTRICT M.C. RELIABILITY TRIAL.
JULY 12.—LIVERPOOL M.C. RACES AT COLWYN BAY.
JULY 12.—BIRMINGHAM M.C.C. MIDLAND AUG. 16.—S.E. COUNTIES INTER-TEAM TRIAL.
SEPT. 15.—A.C.U. SIX DAYS RELIABILITY TRIALS.

A Maidenhead M.C.C.?

An attempt is being made to start a motor cycle club in Maidenhead and the surrounding district. All motor cyclists who are interested are requested to communicate with Capt. J. V. Hey, Coruisk, Cookham, Berks.

Macclesfield and District M.C.

The opening run of the above club will take place on Sunday, June 1st, starting from the club's headquarters, the Spread Eagle Hotel, Chestergate, Macclesfield, at 2 p.m. Members and non-members are cordially invited. The run is to Peover, where a picnic will be held.

Sutton Coldfield and Mid-Warwickshire A.C.

H. Greaves (Calthorpe - Precision), announced as winner of the Levis Cup, was disqualified for non-production of sealed envelope at the finish, and the amended results of the trial are as follows: (1.) A. Milner (2½ h.p. Diamond), time error 1m. 15½s., Levis cup and gold medal; (2.) Seymour Smith (2½ h.p. Ivy), 2m. 28½s., club gold medal; (3.) Rex Mundy (8 h.p. Matchless sc.), 3m. 1½s., club silver medal.

Bristol M.C.C.

Many entries have been already received for the Whitsuntide tour-trial, Land's End and back. Entries will be received up to the first post on June 5th if sent to Mr. H. Smith, 6, Brynland Avenue, Bishopston, Bristol. Accommodation has been reserved for a limited number at the Land's End Hotel.

West Kent M.C.

At a general meeting of the Blackheath and District Motor Club, held recently, it was decided that in future the club will be known as the West Kent Motor Club. Arrangements are being made for the headquarters to be situated in Bromley, and an early commencement of the club's activities is anticipated. With this in view, a further meeting will be held to-night (Thursday, the 29th), at 8.30, at the White Hart Hotel, Bromley, Kent. All motorists interested are invited to attend.

Finsbury Park C. and M.C.

A reunion and garden party will be held on Saturday of this week (the 31st) at the residence of Mr. E. Allen (vice-president), "Mount View," Little Heath, Potters Bar. Tea will be served at 5 p.m. Past, present, and prospective members are cordially invited. Tickets 1s. each from the hon. sec., Mr. J. Evans, 33, Springdale Road, N.16.

Halifax M.C.C.

This club has been revived, and weekly runs are being arranged to which all local motor cyclists are invited. This year the activities of the club will probably be confined to social runs, but several competitions are suggested for 1920. The subscription is 5s., and arrangements are pending by which it may be possible for the club to use the Clare Hall, Y.M.C.A., as headquarters.



Times to Light Lamps.

SUMMER TIME.

May 29th	...	9.31 p.m.
" 31st	...	9.33 "
June 2nd	...	9.36 "
" 4th	...	9.38 "

High Prices in France.

At a recent sale of Army motor cycles in France the prices of the new 4 h.p. Triumphs on sale varied between £120 and £140.

Police Trap.

We are informed that a police trap, in which motorists are timed both ways over one mile, is working on the London side of Maidstone. The distance is unusual, as police traps in the Metropolitan area are usually over a furlong.

Another Ford Rumour.

It appears that a large aerodrome in County Antrim, which has been occupied by the R.A.F., has been purchased by Henry Ford, and on this it is stated that a huge works will be established for the making of motor cycles to be sold at £10 each.

Costly Railway Travel.

A railway expert has stated that at least two years must elapse before British railways can be restored to their normal carrying powers, and that there is no hope of the fares being reduced for a considerable time. Owners of motor cycles can regard this news with more equanimity than most people. Those, however, who are awaiting delivery of new machines will grow more anxious as the holiday time approaches; especially as manufacturers are behind in their deliveries.

Southend Race Meeting.

By permission of the Corporation of Southend-on-Sea the Essex Motor Club will hold an open race meeting on the Western Esplanade, Westcliff-on-Sea, on Wednesday, June 25th.

The various events will include classes for cars and motor cycles of all types and sizes, and given fine weather a very interesting meeting should result. It is expected that a great number of manufacturers will enter their new models, of which, in a number of cases, this will be the first public appearance.

Entry forms and full particulars may be obtained upon application to the hon. organising secretary, Mr. Harold Fuller, 51, Pulteney Road, South Woodford, Essex E.18.

London-Edinburgh Run—the Timekeeper at the Start.

We greatly regret to learn of the sudden and serious illness of Mr. A. G. Reynolds, who was to have started the competitors from Highgate. Mr. Reynolds has had to undergo a serious operation, and we learn that he is progressing as satisfactorily as can be expected.

His place as timekeeper at the start will be taken by Mr. A. V. Ebbelwhite.

Motor Cycles for the Post Office.

The Treasury has sanctioned the purchase by the G.P.O. of 500 motor bicycles for the carrying of mails. The experiment will be confined to London at first.

Motor cycles have been used by the U.S. Post Office for many years, and we do not doubt that their use in England will be most successful.

It is wonderful how slow the Government have been in realising the value of motor cycles until the war forced it upon their notice. For years the American police have employed them, while the only interest the British police force have taken in motor cycles has been the trapping of their riders.

Petrol Prices.

Last week we published what purported to be the revised prices of petrol. The information then held by *The Motor Cycle* concerning the imminent drop in the cost led us to believe the prices to the public would be approximately as stated on the postcard which we reproduce. They appeared to be reasonable retail prices, and we accepted them as such. Unfortunately for motor cyclists, the Shell Co.'s information advice referred to wholesale prices, although there was nothing to indicate this on the postcard. Instead of the prices retail being 2s. 8d., 2s. 6d., 2s. 6d., and 2s. 4d., they are 3s. 1½d., 2s. 11½d., 2s. 11½d., and 2s. 8d. for Shell, Flag, Crown, and benzole respectively.

"SHELL" MARKETING COMPANY, LIMITED.

19 MAY 1919 1919

We beg to advise you of ALTERATION in prices of our Brands of Motor Spirit

Prices are now as follows—

"SHELL" MOTOR SPIRIT	2/8	PER GALL.
"SHELL" MOTOR SPIRIT	2/6	PER GALL.
"SHELL" MOTOR FUEL	2/6	PER GALL.
"CROWN" MOTOR SPIRIT	2/6	PER GALL.
"BENZOL" SPIRIT	2/8	PER GALL.

Special Features.

SCOOTER DEVELOPMENTS.

THE MOTOR CYCLE IN THE EAST INDIES.

OVERSEAS SECTION.

Detroit's Export Output.

During 1918 Detroit, U.S.A., supplied 8,550 cars to Canada, 2,700 to Japan, 3,830 to Australia, 3,360 to France, and 2,090 to the United Kingdom.

An Outing for Crippled Children.

London motor cyclists who have sidecar outfits are appealed to by the Cripples' Mission of the Shaftesbury Society and Ragged School Union, Bethnal Green Branch, 32, St. John Street, Theobald's Road, London, W.C.1, to take some of the poor crippled children of Bethnal Green for a good day's outing in Epping Forest. A date will be fixed in July. Any help will be greatly appreciated by the Society.

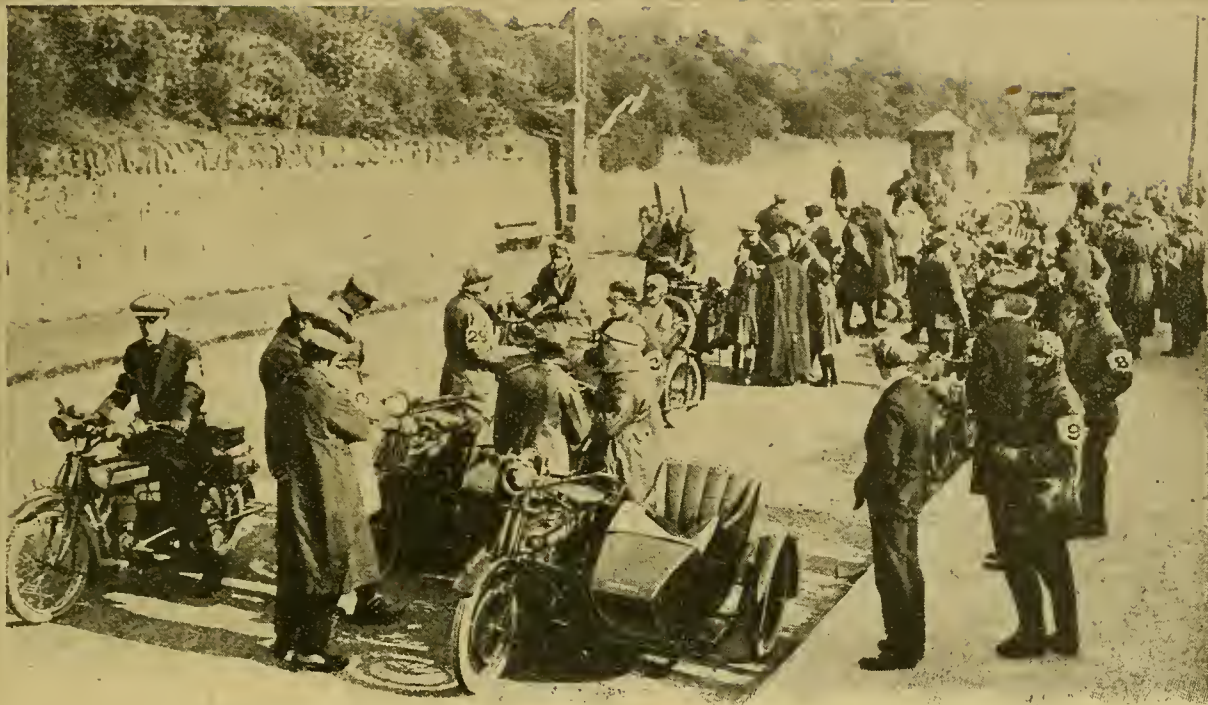
The Popularity of the Passenger Machine.

The predominance of sidecar machines over solo mounts now on the road is most marked, and where the single track machine is used, fully 50% carry a passenger on the pillion. In club runs especially is the popularity of the passenger machine made manifest: as an example, at the Redditch and District M.C.C. opening run last week between thirty and forty members were present, only two of whom were riding solo.

Twenty-hour Open Trial in Ireland.

The twenty-hour open reliability trial organised by the Cork and District M.C.C. will be held on June 9th over the 1915 course, viz., Cork, Fermoy, Dungarvan, Carrick-on-Suir, Clonmel, Mitchelstown, Cork, Killarney, Waterville, Kenmare, Macroom, and Cork. An average speed of 20 m.p.h. is to be maintained, and Gowlane and Ballagisheen Hills will be "observed." There will be no split-second timing at secret checks. First-class awards, gold medals; second-class, silver medals; third-class, bronze medals.

As the committee are not satisfied with any of the usual methods of finding a winner of a single cup, substantial presentation prizes will be awarded to all competitors qualifying for first-class awards. The trial should be a very sporting event, as the club, in framing the rules, has taken into consideration the fact that few 1919 models are available. Rules, entry forms, and full particulars may be obtained from the hon. sec., Mr. R. S. Russell, 4, Prince's Street, Cork.



A scene at the start of the first official run of the Edinburgh Motor Club which took place last week.

Chairman of A.C.U. Competitions Committee.

The Rev. E. P. Greenhill has been unanimously elected chairman of the Competitions Committee of the A.C.U., with Mr. A. G. Reynolds as the deputy chairman.

"The Motor Cycle's" Recruits.

The O.C. of a Motor Machine Gun Battery writes from the Caucasus: "All the best men in this battery who served with me in France were recruited by *The Motor Cycle*."

Results of Birmingham-Llangollen Trial.

The premier award in the Birmingham M.C.C. two days' trial to Llangollen and back was won by H. P. Cutler (4 h.p. Norton sc.). The special prizes in Classes A and B were awarded to G. R. Morgan (4 h.p. Triumph sc.) and W. A. R. Bown (2½ h.p. Bown-Villiers) respectively, while T. F. Watson (4 h.p. Norton sc.) won the novices' prize. In addition to these, twenty-eight competitors were awarded silver medals.

Defining the Trade Rider.

The old-time difficulty of defining a trade rider is agitating motor cyclists in the North. The Motor Cycle Board of the North-Eastern Automobile Association has a rule that "No official of the Board shall be connected with the motor trade as a means of earning his livelihood." This is felt to be too sweeping, but a just definition is difficult. The question will probably be considered by the Motor Cycle Board at its first post-war meeting called for to-night, the 29th, at Newcastle, when the question of competitions for the present year will also be settled.

Our Summer Number.

Full of interest and valuable hints and information set forth in a bright and interesting manner, the Summer Number of *The Motor Cycle*, which will be published on June 19th, will provide matter for thought, help, and entertainment of motor cyclists the world over. The contributions include articles on many phases of motor cycling—summer tours, picnicking, competitions, sidecar matters, design, etc., all fully illustrated, and it should be of more than ordinary interest to all who have occasion to use the motor cycle.

York Club Trial.

At the reliability trial held on the 21st inst. the club gold medal was won by G. A. Walker (three-speed Triumph), and the second award, a silver medal, was secured by R. B. Russell (Triumph two-stroke). The run took place through some of the finest scenery in Yorkshire, and the weather was ideal.

London-Edinburgh Run—Lights and Numbers.

Competitors are warned that they must take special care to see that their registration numbers are of the correct size and are properly illuminated.

SPECIAL SUMMER NUMBER

Our issue for JUNE 19th will be enlarged, and contain many special articles of more than usual interest to every motor cyclist.

Competitors are also reminded that in electric lamps the bulbs must not exceed 24 watts (24 nominal candle-power); in acetylene lamps the burners must not consume more than 21 litres of gas per hour. The front glass of all electric and acetylene lamps in which the diameter or longer side (according to whether the glass is circular or rectangular) exceeds 5in., all electric lamps in which the bulb exceeds 12 watts or 12 candle-power, and all acetylene lamps in which the gas consumed is more than 14 litres per hour, must be obscured with at least one thickness of ordinary white tissue paper.

Triumph Prices.

We are advised that owing to the present cost of labour and material the retail prices of Triumph motor cycles will be increased on June 10th. The new prices will be: 4 h.p. three-speed model, £92; 4 h.p. T.T. roadster, fixed gear, £75; two-stroke, £60.

Helping the Motor Car Novice.

There appears to be the opinion of many motor cyclists that cars require far less attention than do motor cycles.

That car owners have their little troubles the same as motor cyclists is confirmed by the demand for "Faults and How to Find Them," by J. S. V. Bickford, M.A., which is published by our sister journal *The Autocar*. This handy little book has now reached its fifth edition, and fully explains remedies for over eleven hundred "faults," and in addition gives a valuable chapter on electric lighting and engine starting sets.

The price of the book is 3s. 6d., and is obtainable at all first-class booksellers, or direct from our publishing offices, 20, Tudor Street, E.C.4.

A Sporting Trial on the Edge Hill Range.

Coventry Club's Event for the Manville Trophy.

MAGNIFICENT weather favoured the competitors in the Coventry and Warwickshire M.C. non-stop reliability trial last Saturday, when thirty-four members started over a sporting course for the Manville trophy.

The enthusiasm shown augurs well for the future of the club, and, although there was nothing strikingly original in the nature of the trial, the stopping and re-starting test on Sunrising Hill provided interest as exemplifying the skill of the riders as well as the quality of the clutches of the various machines.

A speed of nineteen miles an hour was required to be maintained over the course of eighty-one miles, which included Edge, Sunrising, Tysoe, Sibford-Ferris, and Avon Dassett hills.

Incident during the first part of the run was not particularly evident. Bicknell (8 h.p. Matchless) unfortunately experienced tyre trouble, as did Ingall (Lea-Francis), otherwise all competitors reached Edge on time.

This famous, but not particularly formidable, hill is light work for any modern machine, although certain competitors took the hill more happily than others. Lt. Milner (2½ h.p. Diamond) came up well. Rycroft, Close, Auerhaan, and White (Triumphs) made fast ascents.

Probably the fastest climb of the solo riders was that of Stretton-Ward, who, unfortunately, broke a valve on Sunrising and retired.

Several of the sidecars ascended the hill on second gear.

A twenty-six miles run was scheduled between Edge and Sunrising, where the stopping and re-starting test took place, and here the setting was ideal. A more beautiful spot would have been difficult to



At the start of the Coventry and Warwickshire M.C. Trial last Saturday. T. R. Gibbins (4 h.p. Rex) being timed away.

find, white and purple lilac, brilliant yellow furze, and bright green foliage making a lovely setting for the colours worn by the ladies witnessing the test.

On this hill a few of the competitors appeared to look amazed when stopped by the marshal, and one could not but think that they had not read the rules very closely.

Sidecarists had the advantage over the solo riders, the latter having to balance the machine on the steep portion of the

hill; but, generally speaking, the performances were good, much better than the light cars that came up later.

One of the best restarts was made by Finch (4 h.p. Triumph sc.). The 8 h.p. Hazlewood, too, was handled well by K. Hazlewood. A. P. McGowran (Triumph sc.) manipulated his clutch splendidly, for a start on this position of Sunrising with a hub gear and sidecar requires some skill.

The 8 h.p. Sunbeam, ridden by J. E. Greenwood took the hill with ridiculous ease, and stopped and got away after the start as fast as any of the solo riders—probably the best performance. The impression formed was that modern clutches can be handled with far less care than of old. They are more fool-proof, and none of the machines gave the impression that they were fitted with harsh, ill-designed clutches.

Crawley (Triumph sc.) suffered gear trouble, and covered fully two-thirds of the course on the second ratio, but did remarkably well.

Several competitors went off the course, while a few got lost altogether before they reached Sunrising.

The following were checked in at the finish: G. H. Thomas (2½ h.p. Monopole), Lt. A. Milner (2½ h.p. Diamond), H. Finch (4 h.p. Triumph sc.), N. Rycroft (4 h.p. Triumph), H. Close (4 h.p. Triumph), T. R. Gibbins (4 h.p. Rex), W. E. Johnson (3½ h.p. Humber), A. E. Auerhaan (4 h.p. Triumph), G. L. White (4 h.p. Triumph), G. Dance (3½ h.p. Sunbeam), De la Hay (3½ h.p. Sunbeam), A. P. McGowran (3½ h.p. Triumph), H. Whitten (3½ h.p. Humber), K. Hazlewood (8 h.p. Hazlewood), H. D. Teage (4 h.p. Triumph sc.), S. Crawley (4 h.p. Triumph sc.), J. A. Dudley (3½ h.p. Sunbeam sc.), J. E. Greenwood (8 h.p. Sunbeam sc.), and A. R. Grindlay (7-9 h.p. Harley sc.).



Capt. H. D. Teage (4 h.p. Triumph sidecar) restarting on Sunrising, with K. Hazlewood (8 h.p. Hazlewood) behind.

The Glasgow M.C.C. Open Climb.

Some Fast Ascents of "Rest and be Thankful."

THE first and open hill-climb of the Scottish season was held on Saturday last. The venue, which was kept secret, turned out to be the famous "Rest and be Thankful" hill, well-known to competitors in the Six Days Trials. An entry of twenty-two, fairly representative of the best riders in Scotland, assembled at the bottom of the hill in perfectly ideal weather.

The event consisted of six classes as follow:

1.—Motor cycles having cylinder capacity not exceeding 350 c.c.

2.—Motor cycles having cylinder capacity exceeding 350 c.c. and not exceeding 600 c.c.

3.—Motor cycles having cylinder capacity exceeding 600 c.c.

4.—Motor cycles and sidecars not exceeding 600 c.c.

5.—Motor cycles and sidecars exceeding 600 c.c.

It was decided to give each competitor two attempts, the fastest ascent to count. Timing was worked by means of synchronised watches, and worked satisfactorily. The surface of the hill was comparatively good, and, with the exception of a little looseness at the corners, was favourable to fast times.

Owing to lack of entries, Class 1 was not run off. Competitors started well down the hill, and the finish was about 100 yards above the well-known hairpin. Roughly the distance covered would be a mile and a half.

Class 2, the first class run off, provided some good riding, W. Deans (3½ h.p. Ariel) taking the hairpin well in both climbs. Capt. Walker (3½ h.p. Triumph) also performed creditably, taking the corner well out, and running no risks. J. W. Walker (3½ h.p. Norton) stopped half-way up the long slope.

The big class produced the best riding of the afternoon. D. M. Brash (7 h.p. Harley-Davidson) was first to start, but the hairpin gave him some trouble.



A sidecar on Rest and be Thankful during last Saturday's hill-climb.

A. H. Alexander (7 Indian) had distinctly hard lines. He travelled up the long slope at a good speed, but, if anything, took the hairpin too fast. Keeping close in on the corner, he was practically bumped off on the stony surface and stopped.

A. Brash (7 Harley-Davidson) made the best ascent of the day. Taking the corner at good speed, he never faltered or wobbled, and gave the impression that climbing "The Rest" was an every day occurrence. T. A. McCreddie (8 Sunbeam) made a good ascent, but not quite as spectacular as the previous competitor.

D. S. Alexander (8 Enfield) made an excellent ascent, his cornering and manipulation of gears being quite a feature.

In the 3½ sidecar class W. Deans (3½ Ariel sc.) and H. W. Ballardie (4 A.J.S. sc.) gave good accounts of themselves. N. Fraser (3½ Sunbeam sc.) was, if anything, a little slower, but nevertheless made a good ascent.

The big sidecar class produced some good cornering, and it was surprising to

see the manner in which the combinations romped up the hill. Here again A. Brash (7 Harley-Davidson sc.) proved that the corner could be taken at speed, and, keeping close in, had no difficulty in surmounting the steep gradient at this point. The spectators were provided with plenty of thrills in this class. J. Barclay (6



A. Brash, 7-9 h.p. Harley-Davidson, taking the bend on Rest and be Thankful in good form.

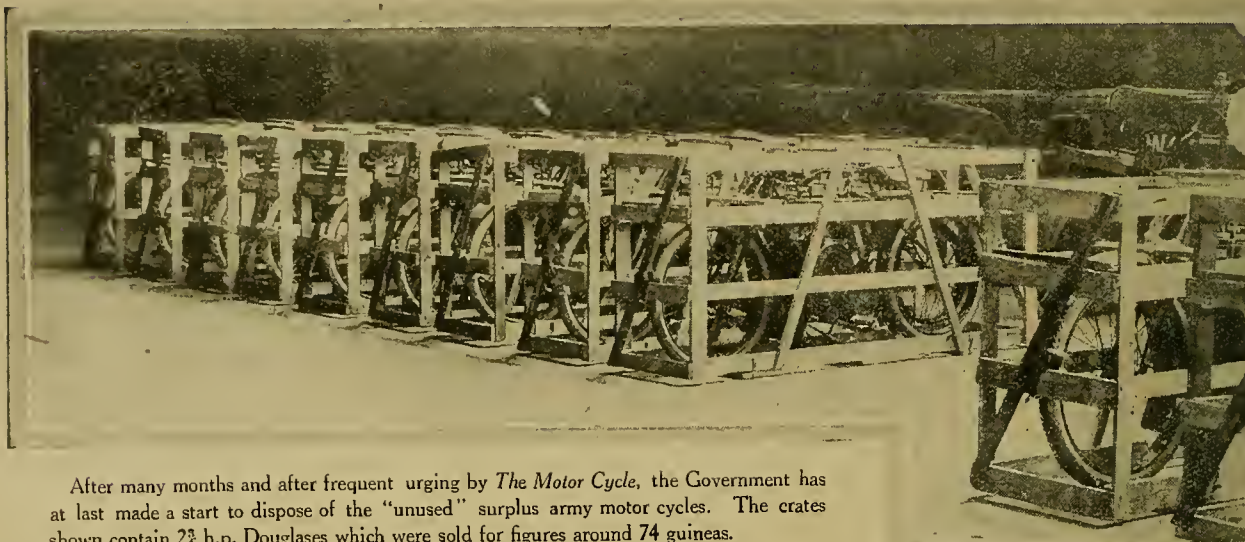
A.J.S. sc.), ascending at great speed, took the corner very fast, and in getting around the bend ripped off his sidecar tyre. Amidst the shouts of the onlookers, he finished on the rim. D. S. Alexander (8 Enfield sc.) repeated his performance in the solo class, making the very best use of his gears. J. Gunning (7 Harley-Davidson sc.) had rather an unfortunate experience. He simply roared up to the bend, and in his effort to take the corner turned completely over. His passenger was badly shaken, but luckily neither was seriously damaged. This competitor had never been up the hill previously, and a trial run would have obviated what might have been a very serious accident. The results will be announced later.



J. W. Walker (3½ h.p. Norton) at the start of the Glasgow hill-climb held last Saturday.

THE FIRST GOVERNMENT AUCTION SALE.

Unused Machines in Neglected Condition realise High Prices.



After many months and after frequent urging by *The Motor Cycle*, the Government has at last made a start to dispose of the "unused" surplus army motor cycles. The crates shown contain 2½ h.p. Douglasses which were sold for figures around 74 guineas.

ON Saturday, at the Royal Agricultural Hall, Islington, under the direction of the Surplus Government Property Disposal Board, some 300 motor cycles and sidecars were offered by auction by Messrs. Goddard and Smith.

So well had the sale been announced that buyers, and would-be buyers, came from all parts of the country in search of bargains. In fact, a queue some 300 yards long had formed before the opening time; once inside the hall, the long procession of people passed the remains of an aeroplane engine exhibit, went through the main hall, with its collection of lorries, and arrived at the Gilbey Hall, where the motor cycles to be sold were arranged.

It had been hoped that the machines offered would be of better quality than those previously put before a none too enthusiastic public, and also that this sale might mark the decline of the fallacious and exorbitant price reached hitherto. Neither of these hopes was gratified, and there were a great number of machines of the type now referred to as Kempton Park models.

"New" Machines Unrideable.

It is true that, within crates, in the centre of the hall were rows of Douglas 2½ and 4 h.p. machines which had never been issued to troops, but on either flank was a hopeless collection of rusty, incomplete motor cycles in the last stages of decay and filth. Even the machines which had not been issued were, in the majority of cases, unrideable, since the tyres had decayed until ominous cracks showed round the walls.

Naturally, one cannot expect used machines to be in really good condition, for Army work is strenuous and the riders, often careless, always busy. One does expect, however, that new machines, still in their crates, should be serviceable, and that the prices to be paid shall represent their value.

The taxpayer part of the motor cyclist will rejoice exceedingly at the high prices, but the real motor cyclist portion of him will grieve.

Passing round the machines one had a good idea of their state. For instance, No. 3, a Triumph, had no belt, no carburetter, no magneto, no front wheel, no rear tyre, no leather on the seat, a much bent gear lever, and no footrests. Yet, for this contraption, in a rusty condition, twenty-one guineas were paid. For another Triumph with both wheels, but wonderfully rusted, without carburetter or magneto, the sort of thing, in fact, that no man would have had before the war, no fewer than forty guineas were expended. Prices for the first collection averaged about £19.

Neither the B.S.A.'s nor the Scotts were in better condition, while some of the Douglasses had just come from an unown field and brought the grass with them.

A Matchless and sidecar fetched sixty-one guineas, and really was a bargain according to that day's prices; but even on this machine the Service "scrounger" had done his worst. Some Indians belonging to the Canadians had their magnetos and carburetters, but apparently this made but little difference to the price.

Some Enfield ammunition carriers in had condition, but not absolute wreckage, fetched from seventy to sixty-six guineas, and the buyer would have to spend some £20 on repairs, and perhaps £30 for a sidecar.

After the lunch interval the unused machines came up, and the crowd became much denser. The price of eighty-two guineas for a 2½ h.p. Douglas, however, was too much for the majority, and was greeted with loud and derisive cheering. Thereafter things settled down, similar machines bringing seventy-four guineas to the taxpayer, until lot No. 135—another 2½ h.p. Douglas—brought the price to seventy-two guineas.

After lot 148 the price fell a little, but

at 156 it went back to seventy-one guineas amid groans and hoots and whistles.

Thereafter the seventy guinea line was held, until the last few machines went at seventy-one guineas.

After the 2½ h.p. came the 4 h.p. and sidecar Douglasses, and prolonged and surprised whistles greeted the opening price of 125 guineas, beaten by the next machine, for which 130 was the figure. Thereafter each combination went at 125 guineas.

One or two lots caused heated arguments, and once the auctioneer had words with a derisive spectator, to the intense joy of the gathering.

Dissatisfied Bidders.

Following the better machines the third batch, consisting of Douglas wreckage, provided little excitement, and a large portion of the crowd went home. Prices for 2½ h.p. Douglasses in very bad condition ranged from eleven and a half to nineteen and a half guineas.

The rostrum was a raised platform on which was the auctioneer flanked by the military. In front were seats for some 300 people, around stood a huge crowd; and in the future it would be well if the auctioneer were provided with a megaphone. Actually at fifty yards' range it was impossible to hear a word or to know which machine was being sold. Naturally, this made a hot and tired crowd very restive, and for the first half-hour of the afternoon it looked as though trouble was brewing. Derisive cat calls, whistles, and shouts of "Fetch a megaphone," "Will the auctioneer speak up?" and "What number are you selling?" completely drowned speech even at shorter range, while the people on the fringes of the crowd pushed and struggled to the discomfort of all.

It is all very well to sell motor cycles at high prices, but surely it would be better to arrange that all might hear the figures even if only as a lesson.



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Herford Street, Coventry, and must be accompanied by the writer's name and address.

AN IDEAL SINGLE.

Sir,—In reviewing the several post-war models of well-known makes, one cannot but notice that manufacturers are disinclined to make any radical alterations in their designs. As a rider and admirer of the Norton single, might I suggest one or two improvements on this otherwise excellent model? 1. Change of position of the magneto to behind the engine, as per T.T. Rover. 2. Flat rims, with 650 x 65 mm. tyres. 3. A slightly shorter wheelbase. Then indeed should we have the ideal single. SPEEDIRON.

Lee, S.E.

THE C.F.B. CYCLE CAR.

Sir,—I am venturing to write to you for the first time, having been a reader of your paper for about six years, with reference to your preliminary account of a proposed new cycle car, described in your issue of April 10th, 1919, and named the C.F.B. cycle car. My only regret is that the designer has only got to the stage of having an experimental model built, as, for my part, I consider the design in every degree excellent (with one exception), that is, of course, as far as the present description goes. If the designer happens to read this letter, I hope that he will see his way clear, at a very early date, to let us have a full description of his design. I cannot help saying that there are thousands of others at present in the Forces who are looking for just such a machine as this, and I congratulate the designer on a good looking and reliable machine. The exception I mentioned above was that I think a single chain drive to the rear axle would be far preferable to the belt drive shown, and would not, I venture to think, add a great deal to the cost.

In conclusion, I hope to see a further description of this machine, and, better still, to own one in the near future at £100. CHAS. W. PERCY.

E.E.F., Egypt.

STANDARDISATION OF CHAINS.

Sir,—With reference to a paragraph in your issue of April 24th, stating that Messrs. Brampton Bros., Ltd., the Coventry Chain Co., Ltd., and Hans Renold, Ltd., had agreed on standard sizes for chains, I am instructed to inform you that the figures quoted by you are incorrect. The three firms above named and Messrs. Alfred Appleby Chain Co., Ltd., are considering the question of standardisation, but are not yet ready to put forward details. Full information will be given to the press in due course.

F. LINDSAY FISHER, Secretary,
Association of British Driving Chain Manufacturers.

ONE-DAY TRIALS.

Sir,—May I make a few remarks concerning the details of the Midland Cycling and Athletic Club's one day trial, as printed at some length in *The Motor Cycle* of May 15th?

Why take a trial for more than 200 miles? Surely 100 or 120 miles is quite long enough for a one day trial, and why give as reason for such a long journey that it enables some extra stiff hills to be included? Surely hills like Birdlip or Rising Sun are quite stiff enough. What ordinary rider wants a machine to climb hills any stiffer than these?

I also note that the course is to be kept a secret. Why is this necessary? Surely one of the objects of a reliability trial is to create interest in the pastime, and how can the average man arrange to get to the most interesting parts of the course if the route is kept a strict secret until shortly before the start?

TOURIST.

Birmingham.

ONE-LEGGED RIDERS.

Sir,—In reply to "Gammy-leg's" letter, *re* one-legged riders. I am also minus a prop (the left one), and recently got a new Royal Enfield combination which is just "it." There are no foot levers on the left side, and in fact, only one foot lever, viz., the rear brake. The foot-boards are long and of a good width, and are also sprung which means a lot as the wooden one is not so apt to jig off. Also having a handle-starter it again meets one's needs, and I might add that from cold a couple of turns are sufficient. I have no connection with the Enfield firm, but have found them to be most courteous in all their dealings. PADDY.

Portadown.

SPARE PARTS.

Sir,—You publish two letters *re* spare parts in your issue for May 8th. May I give my experience?

I have a 1913 Humber, and broke the spindle of my kick-starter. I wrote the makers for a quotation, and in their reply they said the parts were not in stock but would have to be made. I ordered them, and they came through in less than a week, and this just before Easter. I then ordered some oversize piston rings to be specially made, and they came through in a short time at less cost than any of the cheap firms advertising in the papers would do them.

Another firm is Mr. Perkins, of Leyton, who sells adjustable pulleys. I ordered one Thursday, and he despatched it the following Saturday afternoon.

The usual disclaimer.

EDGAR CARR.

EMPLOYMENT FOR DESPATCH RIDERS.

Sir,—It was very gratifying to note that the work of motor cyclists during the war had been so much appreciated that the A.C.U. were considering the advisability of suitably commemorating their services. What would be infinitely more gratifying is that something be done in the matter of employment for some of us D.R.'s who have been demobilised and who have been experiencing very great difficulty in obtaining jobs.

Personally (an ex-D.R. with 4½ years' continuous service in Mesopotamia, Palestine, India, and Egypt—part of this time an infantryman) I have applied to those well-known makers, whose machines I have ridden under all conditions, for any kind of job, only to be met with the reply that, "owing to having to re-instate all their pre-war employees, they can hold out no hopes at present." I grant that this is highly creditable to the firms, and their pre-war employees should count themselves very lucky, but those who have no jobs to go back to and those of us who came from the Colonies to join up in 1914 are still on our beam ends.

Cullompton.

L.A.C.

AN IMPOSITION AND A WARNING.

Sir,—I recently purchased a new motor cycle from an agent in a well-known Varsity town. I went over and drove the machine away. Nevertheless, the agent had the audacity to charge me for the crate, 25s. I paid, but took the matter up, and found from the manufacturers that he had no right to make this charge, the price of crate being included in the price of the machine. Pressure was brought to bear, and the money refunded.

This may be of interest and help to others. If any have had to pay, as I did, they should take immediate steps to recover their deprivation. This sort of thing should be stopped at once. It is bad enough to pay such high prices for machines without paying *twice* for a crate.

VOXN PAH.

THE MOTOR CAR ACTS AS APPLIED TO THE MOTOR SCOOTER.

Sir,—May I, through the medium of your valuable paper, offer the suggestion and invitation to those manufacturers and others interested in the scooter movement, that a combined effort be made to secure modification of the Motor Car Acts of 1896 and 1903, as applied to the auto-scooter.

Bearing in mind that the h.p. of the motor scooter proper should never exceed 2 h.p., and the weight 80 lb. maximum, at least a 50% reduction in tax should be made. Also, with a lightweight vehicle of this type, two powerful brakes are not only unnecessary but dangerous. E. O. STAFFORD.

EVOLVING A MOTOR CYCLE FROM FIRST PRINCIPLES.

Sir,—Maj. Waterlow's article on motor cycle design from first principles is open to criticism.

With reference to fig. 1, by applying first principles of forces in structures, it will be found that the members E from head to saddle strut, and saddle strut to beam carrying rear wheel, are not in tension but in compression, and therefore to be economical and prevent undue loading of the tie-rod from beam B to main frame A there must be struts.

With regard to the use of an aluminium alloy casting for such construction, I do not think anything is to be gained, as far as saving in weight is concerned.

I would pin my faith to steel in the form of pressings. From a cost point of view, it does not appear by any means cheap. A. R. HENDERSON.

THE NEW A.B.C.

Sir,—As a rider in the Tropics, allow me to endorse what you and others have said in criticising the new A.B.C. motor cycle regarding the necessity for a wholly enclosed chain case. This is absolutely necessary in tropical countries, where, for nine months in the year, the wheels will be driving through thick dust, which, combined with the oil, soon wears chain and wheels. It is the lack of this on a chain-driven machine which makes me hesitate to invest in an A.B.C. I notice also that "a series of large rubber buffers" are used in connection with the "cush" drive. Rubber in any form used in any article in the Tropics is fatal, as it perishes in no time. One other point, the sheet metal frame in front of the engine. This, it is stated, has adjustable airways. Will these be sufficient for temperatures of 100° and over in the shade? Calcutta. INDIA.

SCOTTISH FERRIES.

Sir,—I write to correct a statement made by A. Scott Freeman in his letter to *The Motor Cycle* of May 15th, in which he says: "It is necessary, however, for the tourist to apply for a passport to travel north of Inverness." The regulations regarding passports for the Highlands were suspended on November 30th, 1918, and one may now travel anywhere in these parts with absolute freedom.

A. Scott Freeman is again in error when he says that the "ferries north of Inverness are rough and ready affairs." The Kessock Ferry from Inverness to the Black Isle (Ross-shire) is one of the best that I have ever travelled on. The boat, which is propelled by steam, is constructed to carry almost any touring car. The fare for motor cycle and rider is 9d. The boat sails once per hour on week-days. The Bona Ferry, which transports travellers from either side of Loch Ness, is also up-to-date, although, so far, big cars are unable to utilise it. Mr. H. Smith, the manager of the company, has a sensible scheme on hand, whereby touring cars of any size will be accommodated shortly. The fare on this ferry is 1s. 9d. for motor cycle and rider. The ferry from Ballachulish to Onich is capable of carrying cars of any size. This ferry is sometimes suspended through bad weather, otherwise it runs every day. The fare for motor cycle and rider is 2s. 6d., which includes an all-in insurance policy.

S. MACKENZIE.

PRICE OF PETROL.

Sir,—The Automobile Association has been told for many months that the cause of the exorbitant prices of petrol was that the Government had purchased such enormous stocks at high prices that they insisted on such prices being kept up to avoid serious loss.

We were further informed that, as soon as the petrol companies were free to market their own stocks, we should see an immediate and appreciable fall in prices.

The long-looked-for moment has arrived, and we learn that the price of No. 3 grade petrol is 2s. 11d., and that of No. 1, 3s. 1d. What a magnificent concession!

It is, surely, yet another proof, if such be needed, of the grip the Trusts have on the industry, and I would once more ask all motorists to join in the A.A. campaign in favour of the production of the trust-free fuel, viz., benzole.

Let all motorists insist that benzole shall be produced to the fullest extent of our country's resources, and let every one of us use benzole when and wherever possible.

I may add that the Fuel Department of the Automobile Association has in the press at this moment a list of several hundred suppliers, which will shortly be available for all members.

STENSON COOKE,
Secretary, The Automobile Association and Motor Union.

HILLS ON WHICH I HAVE FAILED.

Sir,—In reading the very interesting article "Hills on which I have failed" in *The Motor Cycle* for May 1st, I notice that "Veteran" alludes to the 1 in 3½ bit on Sutton Bank. Now the steepest bit on Sutton Bank is practically 1 in 4, which is a very different proposition. During the Easter holiday I did a good deal of stiff hill-climbing on a standard geared 3½ Sunbeam (1916), including Rest-and-be-Thankful, Kirkstone Pass, Spital of Glenshee, and Sutton Bank. I was unable to take my passenger up the last-named hill with an engine that had run 800 miles since cleaning, and was about ready for decarbonising, but on dropping the passenger the machine started at the steepest point and sailed up in fine style. The surface is very bad.

I think your readers would appreciate a chart showing, say, the gradient of twenty or thirty worst main road hills in Great Britain which could be pasted on cardboard and hung in the cycle shed or house.

Furthermore, unless "Veteran" is writing entirely from a "solo" point of view, I would differ with his statement that a novice can set out on practically any modern machine and climb these hills very often without recourse to bottom gear. I have been driving fourteen years, and during touring conditions find that when I tackle hills like Kirkstone Pass and Rest-and-be-Thankful without stopping to cool down at the bottom, it takes all my skill and the use of the bottom gear to make a clean ascent with passenger and coachbuilt sidecar, and think it would be rather disheartening for a novice to set out for a 1,000 miles to tackle the collection I mention, and expect to sail up either on half-throttle or middle gear.

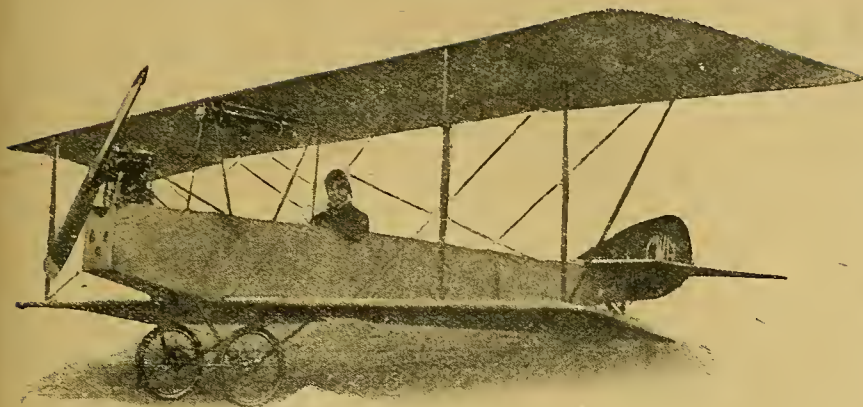
Halifax.

SUNBINKS.

[We published details of the principal hills in Great Britain in *The Motor Cycle* of March 28th, 1912.—En.]



Many large engineering works now have their own motor cycle clubs. A meet of the Siddeley-Deasy M.C.C., which club is composed of motor cyclists who help to produce Siddeley-Deasy aero engines and cars.



A biplane of simple design produced by an American motor cyclist, who used his twin Indian engine as the power unit. It is stated that a speed of 45 m.p.h. has been attained.

A TABLOID HISTORY OF AIR-COOLING.

Sir,—In his letter on the above subject (May 15th) "Pitot" gives some figures which are so absolutely hopeless that correction is necessary.

I have made out a table giving the correct horse-power and consumption, and also stated the reports from which my figures have been taken:

H.P.	Engine.	Consumption, Galls./Hr.	
200	S.P.A. 6A	13	<i>Aeronautics</i> , 27th March; <i>Flight</i> , 3rd April 1919.
260	Puma ...	18.69	Ditto, ditto.
230	Benz	18.75	"Enemy Aircraft Engines" (Hiffe and Sons Ltd.).
250	B.R.2 ...	20	<i>Aeronautics</i> , 27th March; <i>Flight</i> , 3rd April 1919.
150	B.R.1 ...	11	Ditto, ditto.
110	Clerget ..	9.17	Ditto, ditto.
130	Clerget ..	10.9	Ditto, ditto.

From the above table it will be seen that "Torque" was fully justified in saying that a rotary consumes about one-tenth of a pint per b.h.p. per hour more than a stationary—in fact, he is well on the safe side.

As regards the R.A.F. 3A, I have tested a good few of them, and, on an average, they developed 250 h.p. with a consumption of between 17 and 18 g.p.h.

It is hardly necessary to point out that the figures obtained on a bench test are the ones to go by, and also that the proper way when comparing engine performances is to express the consumption in pints or pounds per b.h.p. per hour. If "Pitot" had only known something of what he is talking about he would have known that it is an absolute impossibility to determine the horse-power and consumption of an engine when flying at 15,000 feet with the instruments supplied in an aeroplane. I should advise "Pitot" to read a most excellent article on "Flowmeters" in *The Automobile Engineer* for May, and he would perhaps begin to realise the extreme accuracy required when determining the consumption of an aero engine.

B.Sc., A.M.I.A.E.

Derby.

EXPERIENCES WITH A 3 H.P. TWIN.

Sir,—I always read with interest the pages of your publication, but "F.A.S.'s" article in your issue for May 15th, under the heading of "Experiences with a 3 h.p. Twin," strikes me as being particularly unfair to the make with which it deals. I have owned a similar machine for the last two and a half years, and perhaps you will grant me space to state my experiences.

To treat the points at issue as they arise:

(1.) "F.A.S." states "the highest speed recorded was 46 m.p.h." Without tuning of any sort I have frequently reached a speedometer reading of 48 m.p.h., with a passenger on the pillion.

(2.) His petrol consumption of 105 m.p.g. is quite a conservative estimate. I have averaged this without altering the air intake in any way, and 75% of runs are performed with "two up."

(3.) Why does he have this difficulty in starting up? I have never injected fuel into the cylinders, and find that, by flooding, two or three kicks are sufficient, including winter conditions and No. 3 petrol. I may say that I never "paddle off" my machine, and, after 4,000 miles, the kick-starter is as lively as ever.

(4.) My height is 6ft. 1in., and yet I find perfect comfort in the riding position. Perhaps "F.A.S.'s" extra inch makes all the difference, or is he broad in rather more than proportion?

(5.) What is wrong with the kick-starter position? I find that, should one inadvertently stop the engine in traffic, it is quite possible, if there is a little "weigh" on the machine, to "kick-start" up again without placing a foot to the ground. The direction of push allows plenty of leverage.

Why has he omitted to mention the front wheel brake (mine has never worked), and would it not be preferable to have a lubrication tell-tale which does not necessitate leaving the saddle?

KENNETH COHEN, Sec. Lt. R.A.S.C.

PLEASE QUOTE PRICES!

Sir,—I believe that thousands of motor cyclists will agree with me that advertisers who use your excellent medium would do far bigger business if they stated the prices of the goods they offer in the advertisements.

They tell us all about the merits of their wares and ask us to write for "interesting booklet." This may be all right in the case of new model solos or combinations where a prospective buyer naturally does not make up his mind without studying several specifications, but in the case of accessories and "gadgets" generally, if he likes the look of a thing on paper, and considers the price reasonable, in eight cases out of ten he will get one from his dealer, or will write to the advertiser direct, enclosing cheque or P.O. But he often will not trouble to write twice.

I have dealt satisfactorily as a customer with several of your advertisers with good things to offer and who have the "savvy" to state the price; but, on the other hand, the advertising pages of my copies of *The Motor Cycle* are earmarked for months back as advertisements of things I certainly need and should have bought long since no doubt were it not for the annoying omission referred to.

It may be a small matter, but I believe that our big cash chemists and tea companies long ago recognised the fact that people will not even trouble to cross the road to make a purchase if they can help it, much less go to the trouble of preliminary correspondence to get what they want.

Brighton.

SUSSEX.

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QUESTIONS & REPLIES

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C.4, and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

A Stuck Rocker Arm.

? I should be much obliged if you would tell me if there is anything one can do when the make and break of a magneto sticks in damp weather besides taking it down and drying it.—D.B.H.W.

You will require to reamer out the bush either by wrapping a piece of emery cloth round a match or by using a suitable reamer. In a case of emergency the tang of a file might be used, but this has much too steep a taper. On no account oil the part of the rocker which oscillates in the bush.

Burnt Exhaust Valve.

? My machine is a 4 h.p. Triumph running with a sidcar on benzole, and I am experiencing great difficulty with the exhaust valve, which burns out rather quickly. I am told this is due to running on too rich a mixture. Would you kindly give me your opinion? I may add that the seating is good, and the valve lifts about $\frac{1}{4}$ in. Also I find when running slowly, say about ten miles per hour, and coming to a corner where there is a big dip on the road, the explosion blows back into the carburettor. This also takes place at times when running at low speed and coming to a bit of very bumpy road. To get over it I have either to open the throttle or reduce air, but find that opening the throttle too suddenly causes the engine to knock if running on petrol. I also find the engine knocks when using petrol if I try to accelerate up a gradient. These knockings are absent when using benzole, although I can feel that the explosion is more powerful, and cannot quite understand why this is so. My carburettor is a Triumph make, and is fitted with two sets of holes against the jet. The smaller and upper set can be closed with a slide. I have tried with the slide open and closed, and can observe no difference in running.—C.B.

Too rich a mixture is quite probably the cause of the burnt valves, as benzole requires a great deal more air than petrol, and it may be advisable for you to fit an extra air valve of some sort between the carburettor and the cylinder, but it is perhaps better to try the effect of a smaller jet first. Examine the inlet valve spring, and see if it is weak. Your ignition timing appears to be slightly too far advanced. The contact breaker points

should just be separated when the piston is about one-sixteenth down the firing stroke, with the spark lever in fully retarded position. Benzole is a slower burning fuel than petrol and requires a higher temperature for ignition; also the explosion is not so violent, but quite as powerful, so that it is not so liable to cause knocking. The holes at the bottom of the throttle barrel are the ordinary air supply holes.

Dynamo Lighting.

? I should be pleased if you would give me the following information: Particulars of wiring for Berko dynamo when using a head lamp and tail lamp, either separate or together. The Berko is driven by contact with the rear wheel tyre. The candle-power, voltage, and amperage of lamps needed for head and tail lamp. Are these dynamos satisfactory when used in conjunction with a dry battery? Would the ordinary pocket flash screw bulb be suitable for the tail lamp, or would it burn out? Particulars of wiring for dynamo, dry battery, and switch for using battery for both head and tail lights when machine is stationary.—W.F.H.

The best way is to wire your head and tail lamps up in series. That is, take a wire from the insulated terminal of the dynamo to a switch on the handle-bar or other convenient spot, from there to one terminal of your head light, from the other terminal of the head light to the tail lamp, and connect the other terminal of the tail lamp to earth, making a good connection to the frame. Both terminals of the head lamp must be insulated. The other terminal of the dynamo must also be earthed on to the frame with a wire. In the above case use a four-volt lamp taking $\frac{3}{4}$ ampere for the head light, and a two-volt lamp taking $\frac{3}{4}$ ampere for the tail light. These will give about 3 and $1\frac{1}{2}$ candle-power respectively. The dynamo cannot be used in conjunction with a dry battery. You could, however, if you wished, use a dry battery for your tail light only, and use the dynamo entirely for the head light, when a six-volt lamp bulb should be employed for the latter. The bulbs used for the ordinary pocket flash lamps must not be used in conjunction with the dynamo, but are suitable where a dry battery is made use of for the tail light as mentioned. To provide a head light when standing will necessitate a separate battery, with its own switch.

Disabled Rider.

? Since I am unable to use my left foot, could you let me have a list of makes of motor cycles which have no foot controls on the left side, and which are also fitted with a kick starter?—J.S.B.

Two prominent machines which have no foot controls on the left side are the P. and M. and the Enfield, but the latter is started by handle. It may interest you to know that Maudes' Motor Mart, Great Portland Street, London, W.1, make a speciality of conversions for disabled riders. All you would require would be the foot brake on the right-hand side and a handle-bar-controlled clutch.

Mysterious Trouble with a Two-stroke.

? My 2 $\frac{1}{2}$ h.p. 1916 two-stroke Ixion was overhauled and taken out for test. The machine started off all right, and simply flew up a steep hill. I turned round and came down the hill with the air and throttle levers shut, but with the engine under compression. On reaching the bottom I opened the throttle, but the engine would not start, and I had to wheel it home. Since then I have tried to get it going, but with no result. The compression is good, but with a hot plug and hot petrol injected into the cylinder it will not fire. Would it be of any use to take the engine down and clean it again?—A.W.

It is impossible to say definitely what the trouble is with your machine without examination, but the first thing to do is to remove the plug, and, by revolving the back wheel, see if you get a spark. If you get a good one you will know there is nothing wrong with the ignition. Next turn your attention to the carburettor, and see if the jet is clear and the float chamber floods easily. As you have tried with petrol injections, however, this is not likely to be the trouble. The timing of the spark may possibly have slipped. Check this by putting the spark lever in central position, turn the engine pulley till the piston is at the top of its stroke, when the magneto contact breaker points should be just about to separate. If they are not in that position, they will have to be altered by uncoupling the magneto driving sprocket and resetting the contact breaker position. As the compression is good, there is apparently nothing wrong with the rings, and there can be no other necessity for taking down the engine again. Observe whether the crank case is airtight and if there are signs of leakage at main bearings.

Magneto Shorting.

? I should be glad if you could enlighten me concerning the magneto on a Scott machine. When pulling the back wheel round with one hand on the frame I can feel the current. I am experiencing difficulty in getting it to start. The spark at the plug, when testing, varies a good deal, being sometimes good and then poor. With the magneto spanner on the brush terminals it throws a good spark between magnets and spanner.—L.D.

Obviously, if you can feel the current from the magneto all along the frame when revolving the magneto, it shows that the current is coming to earth or short circuiting instead of passing along the high tension wire to the plug. Without examining the machine it is very difficult to tell what is wrong, but you should carefully examine the high-tension cable to see if the wire is exposed and touching the frame. It might touch occasionally and cause the poor spark which you mention. Apparently there is nothing wrong with the magneto itself.

Aid to a Beginner.

? I have never driven a motor cycle (but have ridden a pedal bicycle for years), nor have I any knowledge of engineering. I am contemplating purchasing a motor bicycle and sidecar, and, as a preliminary, have been studying your book "Motor Cycles and How to Manage Them" and reading *The Motor Cycle* for the last month or two, and also seeking advice from friends who have motor cycles. I am now in a quandary, and am writing to you for advice. In the book you suggest at least 6 h.p. twin for sidecar work, but I see machines such as B.S.A., Ariel, etc., with single cylinders and less horse-power, advertised as all that is necessary for sidecars, and I also see many singles running which seem to get along all right. (1.) Please tell me the advantages, if any, of the more powerful machines. (2.) Referring to the book, how does one carburettor supply the two cylinders of a twin? (3.) Would it be advantageous to fit a carburettor to each cylinder? (4.) I often read "the engine is 74.5 x 80, 350 c.c.," etc. What do these figures refer to?—A.R.B.

(1.) A single-cylinder motor bicycle and sidecar of, say, not less than 3½ h.p., is quite satisfactory for ordinary touring, provided only one passenger is taken and not much luggage, but when you take a heavy passenger and a great deal of luggage a 6 or 8 h.p. would be necessary, and with such a reserve of power you would be capable of climbing any hill in the country, and hills abound wherever the scenery is most attractive. (2.) The carburettor is usually fitted with a T shaped or Y shaped induction pipe, and one carburettor is capable of supplying two or even four cylinders. (3.) No; it would be wasteful and extravagant. (4.) The figures mean that the bore—that is to say, the diameter of the cylinder—is 74.5 mm., and that the distance through which the piston travels in the cylinder is 80 mm. 350 c.c. is the piston displacement in cubic centimetres. This is all described in "Motor Cycles and How to Manage Them."

Pre-ignition.

? I have a 1914 2½ h.p. Douglas. The other day I was testing it for speed, and, having run at 38 m.p.h., it suddenly began firing in the silencer. After about twenty yards of this, the machine slowed down, and finally stopped. I took out the plugs, and could find nothing wrong. On restarting, it fired evenly until I ran over 30 m.p.h., when the same thing happened. On shutting off, the engine recommenced smooth running, and continued so long as the speed was under 30 m.p.h., the engine seeming to have a strong objection to exceeding this speed limit. I should be glad if you would explain the most probable cause of this trouble.—Lodge.

The trouble may be due to a partial obstruction in the petrol pipe, which so restricts the flow of petrol that when a greater amount is required at high speeds the supply fails and the carburettor becomes empty. It is more than likely, however, that you are using unsuitable plugs, which cause pre-ignition. This would also account for the symptoms you describe.

READER'S REPLY.**Timing a Two-stroke.**

I note that B.C.O. cannot get his Levis to run after an overhaul. I had exactly the same trouble, being unable to get the least sign of an explosion, after trying all three grades of petrol, and carefully checking the timing and eliminating all air leaks. In the end I emptied all the petrol out of the tank, filling up with benzole, and, to my surprise and joy, the engine started running with one pull over of the back wheel. I generally run with half benzole and half petrol, but it will start up and run well on petrol alone now, and invariably starts within two yards, and without giving an injection. What the original trouble was I do not know.—R. W. WHALLEY.

RECOMMENDED ROUTES.

STALYBRIDGE TO BIRMINGHAM.—P.H.I.
Stalybridge, Stockport, Altrincham, Northwich, Tarporley, Woore, Stone, Rugeley, Lichfield, Sutton Coldfield, Birmingham.

EALING TO BOURNEMOUTH.—C.F.H.
Ealing, Richmond, Kingston, Esher, Ripley, Guildford, Farnham, Alton, New Alresford, Winchester, Romsey, Cadnam, Lyndhurst, Hinton-Admiral, Christchurch, Bournemouth.

LIVERPOOL TO BIRMINGHAM.—H.W.H.
Liverpool, by ferry to Birkenhead, Chester, Whitchurch, Hodnet, Wellington, Crackley Bank, Gailey, Brownhills, Ferry Bar, Birmingham.

SHREWSBURY TO LLANDUDNO.—W.E.P.
Shrewsbury, West Felton, Llangollen, Pentre Voelas, Bettws-y-Coed, Llanrwst, Llanantffraid, Llandudno. Approximately 85 miles.

NORWICH TO MIDDLESBROUGH.—R.W.
Norwich, Hockering, East Dereham, Swaffham, King's Lynn, Long Sutton, Holbeach, Sutterton, Sleaford, Leadenham, Newark, Tuxford, Retford, Bawtry, Doncaster, Wentbridge, Ferrybridge, Aberford, Wetherby, Boroughbridge, Thirsk, Tontine Inn, Yarm, Stockton, Middlesbrough.

BATH TO PEN-Y-GRAG.—W.W.
Bath, Chipping Sodbury, Wickwar, Wotton-under-Edge, Berkeley, by train via Severn Bridge to Lydney, Chepstow, Newport, Caerphilly, Pontypridd, Pen-y-Graig. Approximately 60 miles.

CLAYDON TO BARROW-IN-FURNESS.—W.D.
Claydon, Stowmarket, Ixworth, Thetford, Mundford, Stoke Ferry, Kings' Lynn, Long Sutton, Fosdyke, Swineshead, Sleaford, Leadenham, Newark, Ollerton, Worksop, Aston, Rotherham, Wortley, Penistone, Huddersfield, Halifax, Kirkley, Skipton, Settle, Ingleton, Kirkby Lonsdale, Kendal, Ulverston, Barrow.



A Harley-Davidson put to strenuous use on a farm. We understand the machine performed the work of hauling this heavily-weighted trailer with ease.



Matchless Repair Works.

We are asked to state by Messrs. H. Collier and Sons, Ltd., the manufacturers of Matchless motor cycles, that the Matchless R.P.R. Works, Regent Park Road, London, N.W., are in no way connected with their firm.

British Motor Cycles in Denmark.

A notable success has been gained by B.S.A. riders in Denmark. In the Copenhagen M.C.C. 400 miles race, first and second places were secured by B.S.A. motor bicycles. These machines were the only competitors (motor cycle or car) to complete the course within the schedule time.

The A.B.C. Export Manager.

We are informed by the Sopwith Aviation and Engineering Co., Ltd., that they have just appointed Maj. H. A. Geaussent to take charge of the export department for their A.B.C. motor cycles.

Maj. Geaussent is well known to many of our Colonial readers, having been for several years previous to the war export manager for the Hutchinson Tyre Co.

Economy of Two-strokes.

The economy of the small ordinary simple three-port two-stroke when properly designed was well exemplified by the 198 c.c. Levis upon which Pike won a gold medal in the Victory Cup Trial. Careful measuring of the fuel used by this competitor revealed that his petrol consumption was 132 m.p.g., which is very remarkable, considering the nature of the course.

Larger Factories.

The Newcastle-upon-Tyne Motor Company have now moved to larger works at St. Thomas's Street, Newcastle. This new factory is being organised for high efficiency production of the N.U.T. motor bicycle.

The Rotax Motor Accessories Co., Ltd., inform us that they have removed their Birmingham works to much larger premises at Landor Street. These works are purely a manufacturing centre, and all correspondence should be addressed to the head offices at Victoria Road, Willesden Junction, N.W.10.

Universoline.

Some reference was made in the issue of May 1st to a preparation known as Universoline, sold by Sterns, Ltd. The preparation is for rendering joints, such as valve caps, gastight, and also preventing them from binding in the cylinder. We lately had some difficulty in removing the valve caps from a little engine which was rather apt to get hot, and after decarbonisation we treated the valve caps with Universoline, after which they were perfectly gastight, and yet after considerable use they were removed without difficulty.

Monogram Co. Reconstructed.

Those motorists who proved the quality of Monogram oil before the war will be pleased to learn that the reconstruction of the British Monogram Oil Co., Ltd., has now been completed, and a new company has been formed, under the title of the British Monogram Oil Co. (1919), Ltd., Stanley Works, Warple Way, Acton, W.3.

A Patent Friction Drive.

We are informed by Mr. F. C. Beauvais, 9, Barent Road, Camberwell, London, S.E.5, who is responsible for the C.F.B. cycle car described in the issue of April 10th, that the cone friction drive used on that vehicle has been protected, and patents are being taken out in respect of the other special features, and also in respect to the car as a whole. It is anticipated that the first car will be on the road at an early date.

Zephyr Motor Attachment.

We are asked by the London and Westminster Industrial Syndicate, Ltd., 8, Victoria Street, London, S.W.1, to state that the Zephyr motor attachment has been protected by grant of letters patent for the United Kingdom and abroad. An application has also been lodged securing patent rights of the stand illustrated in the issue of April 24th, which will be of service for Zephyr and other motor cycles fitted up by the Syndicate.

A Useful Scheme.

Messrs. Phelon and Moore are sending their representative, Mr. R. Lewis, to visit all towns where there are P. and M. agencies. He will be driving a standard P. and M. sidecar outfit, and will give demonstrations to prospective riders, give advice to present owners of P. and M. motor cycles, and help them with any difficulty which they may be experiencing.

This scheme is to be run closely on the service lines which exist in the car world, by means of which manufacturers help those who have purchased their vehicles for some considerable time after delivery.

The Creation of a New Industry.

We have received from Messrs. Thomson-Bennett Magnetos, Ltd., an attractive booklet containing some account of the creation of the magneto industry in this country after the outbreak of war. Before the war Messrs. Thomson-Bennett were the only makers of magnetos in England, and their output was negligible compared with present-day production. Our readers can obtain copies of this booklet on application to the above firm at Great King Street, Birmingham.

The O.K. Junior Flat Twin.

Messrs. Humphries and Dawes, Ltd., of Hall Green Works, Birmingham, have been very busy on special work in connection with Handley Page, Sopwith, and other makes of aeroplanes. They are one of the few firms who are being ordered to continue in this direction, and this will occupy a good section of their works for some time. However, they are busy completing the design of the new O.K. Junior horizontal twin $2\frac{1}{2}$ h.p. motor cycle.

From Tanks to Lighter Vehicles.

Maj. Frank Vandervell, who has just started in partnership with his brother Lt. Percy, under the name of "Vandys," as motor agents, etc., at Pembridge Gardens, Notting Hill Gate, was from 1902, and until the outbreak of war, intimately connected with the electrical firm of C.A.V. at Acton, of which his brother Charles is the head. He was mobilised two days before the declaration of war (being then a member of the Artists' Rifles), and served with distinction both in Gallipoli and France, first with the South Lancashire Regt. and then with the Tank Corps, of which he was one of the first six officers, and received his majority in January, 1917.

Catalogue Received.

Messrs. Douglas Motors, Ltd., Kingswood, Bristol, have prepared a new booklet describing their 4 h.p. model. This is a most interesting publication, which should strongly appeal to the many users of the 4 h.p. Douglas sidecar combination.



A meet of the Redditch M.C.C., composed chiefly of members of the staffs of the B.S.A. and Enfield Co.'s.

MISCELLANEOUS ADVERTISEMENTS.

PRICES.

ADVERTISEMENTS in these columns—First 12 words or less 2/., and 2d. for every additional word. Each paragraph is charged separately. Name and address must be counted. Series discounts, conditions, and special terms to regular trade advertisers will be quoted on application.

Postal Orders and Cheques sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd., and crossed & Co. Treasury Notes, being untraceable if lost in transit, should not be sent as remittances.**

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.4), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge, which must include the words Box 000, c/o "The Motor Cycle." Only the number will appear in the advertisement. All replies should be addressed No. 000, c/o "Motor Cycle," 20, Tudor Street, E.C.4. Replies to Box Number advertisements containing remittances should be sent by registered post.

DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pays carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged; when under £10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

MOTOR CYCLES FOR SALE.

A.B.C.

EARLIEST Deliveries of A.B.C.; book your order now.—Witham Bros., Newport, Wight. [1355]

A.B.C.—Caffyns, Ltd., Eastbourne, distributors for Sussex, are booking orders for earliest deliveries. [0016]

CROW Bros., High St., Guildford, have contracted largely for the new A.B.C. Order now for earliest delivery. [5298]

A.B.C.—Earliest deliveries; your name on our book ensures this.—Martin Mitchell, Ltd., Wholesale Distributors, Stafford. [X9866]

A.B.C.—We are now taking orders for the new A.B.C. twin; order now for early delivery.—P. Ellis and Co., 360, Lillie Rd., Fulham, S.W.6. [8460]

LIVERPOOL and District Agents for A.B.C. Place orders now to secure early delivery.—Victor Horsman, Ltd., 9, Parr St., Liverpool. [0003]

JONES' Garage.—We are in a position to accept orders for A.B.C. motor cycles; deposits optional; delivery April or May.—Broadway, Muswell Hill, N. [0991]

A.B.C.—Distributors for Scotland. Book your order now to ensure reasonable date for delivery.—Edinburgh Pioneer Motors, Ltd., 50, Grindlay St., Edinburgh. [X8301]

100, Gt. Portland St.,
London, W.1.

Dear Sir,

We thank you for your letter of enquiry for earliest delivery date of 1919 Motor Cycles.

We are sorry to have to disappoint you, but deliveries are coming through so slowly, and we have already booked so many orders, which must be dealt with strictly in rotation, that we are afraid it would only lead you to expect a machine at an early date if we accepted your deposit.

We think it best to be perfectly frank as to the position, and we are sure you will understand that, if we could help you, we should have been only too pleased.

If you care to consider a second-hand machine, we shall be glad to forward you our list.

Hoping to have the pleasure of supplying you at a future date,

Yours
faithfully,

MAUDE'S
MOTOR
MART.



Telephone: Museum 557.
Telegrams: "Abdicat, Wesdo, London."

IMPORTANT NOTICE.

Owing to the Whitsun Holidays, the issue of "The Motor Cycle" for June 12th must be closed for press earlier than usual. All copy and instructions for Miscellaneous Advertisements in that issue must, therefore, be in our hands not later than first post on Thursday, June 5th.

MOTOR CYCLES FOR SALE.

A.B.C.

A.B.C.—Sole agents for these famous machines. Orders booked now for early delivery.—Chandler, Revre, and Williams, Sun St., Hitchin. [0996]

FANCOURT'S Garage, Stamford, for A.B.C.'s; sole distributing agent for Soke of Peterboro' and County of Rutland; particulars and illustrations on request. [X9724]

A.B.C.—Book early and prevent disappointment. Specification and full particulars will be sent on application.—The Spalding Motor Co., Ltd., Spalding, distributing agents for Lincolnshire. [X6969]

DAN BRADBURY, 224, London Rd., Sheffield, sole A.B.C. distributing agent for Sheffield and district, will give you earliest possible delivery of the new A.B.C. motor cycles and light cars. [7270]

Abingdon.

31 h.p. Abingdon K.D., new Amac carburettor, new 32" belt, good tyres, h.b.c., in good condition; £45, or offers; after 7.—526, Devon Buildings, Tooley St., S.E. [1896]

ABINGDON King Dick, 5-6 h.p. twin, 1914, 3-speed, clutch, Bosch, Senspray, all in perfect order except frame, which is broken; what offers cash, or exchange for lower power.—N., 32, Lampton Rd., Hounslow. [1839]

A.J.S.

JACK HEALY, Cork,—Official A.J.S. agent,—Garage and works, Drinnan St. [X8336]

1919 A.J.S. Combinations.—Write Merrick's Stores, 174, Listerhills Rd., Bradford. Phone: 2439. [X2436]

1916 6 h.p. A.J.S. Combination, hood, screen, spare wheel, lamps, mirror; £130.—Brook, 37, Hampden Place, Haliifax. [X1880]

1916 2½ h.p. A.J.S., 3-speed, clutch, kick starter, lamps, horn, fine condition; £65.—12, Herbert Rd., Plumstead, Kent. [2142]

A.J.S.—For quick deliveries try the sole Leicester shire agent, Will Chapman, 113, Belgrave Rd., Leicester, the first appointed A.J.S. agent. [3531]

A.J.S. Spares; engine and gear box repairs; prompt delivery.—Cyril Williams, Chapel Ash Depot, Wolverhampton. T.A.: Parts. [1089]

A.J.S.—Exeter Motor Cycle and Light Car Co., Ltd., Bath Rd., Exeter, and 28, Tavistock Rd., Plymouth. Sole agents. Now booking for earliest deliveries. [0007]

A.J.S. 1917 Combination, recently overhauled, spare wheel, hood, screen, apron, Klaxon, spare tube, new seatless trousers, etc.; 138 gns.—Cooke, 32, Church Rd., Wimbledon. [2058]

1916 A.J.S. 5 h.p. Coachbuilt Combination, luggage grid, apron, 3-speed, k.s., hand clutch, tyres and machine as new; £120; letters only.—L., 23, Thornton Rd., Barnet, N. [2191]

LATE 1916 A.J.S. 6 h.p. Combination, hand clutch, kick starter, Lucas dynamo lighting set, spare wheel, new tyres, accessories, in beautiful condition, little used; £155.—Wiggins, Fellmonger, Witney. [X1406]

A.J.S. 6 h.p. Combination, from the works June, 1918, and purchased June 1918, 1918, acetylene lamp, Lucas bulb horn, spare wheel, original covers, spare set piston rings, ditto valve springs; a bargain at £150; no dealers by request.—J. E. Poulson, Wheat Sheaf Hotel, Cheadle, Staffs. [X1711]

Alldays.

ALLON.—Caffyns, Ltd., Eastbourne, for delivery shortly. [0017]

ALLDAYS Matchless, Villiers engine, 2½ h.p., 2-stroke, good condition; 30 gns.—Stokes, New Rd., Oundle, Northants. [X1326]

ALLON 2½ h.p., 2-stroke, 2 speeds and clutch, horn, and lamps, good condition.—7, Mayfield Cottages, Sandridge, Sevenoaks. [X1805]

ALLON, late 1918, 2½ h.p., 2-speed, hand clutch, leg shields, mechanical horn, spare Dunlop leg new tyre, spare front mudguard, and all tools, guaranteed climb Portway, spare Voltalite lighting set, front and rear; £55.—Cridland, Barnwood, Gloucester. Tel.: 27 Barnwood. [X1777]

MOTOR CYCLES FOR SALE.

Alldays.

ALLDAYS 2-atrke, 2-speed, 1917, only 500 miles, P. and H. lamps, Spanton horn, in absolute new condition; £50.—16, Clarendon Sq., N.1. (Near Angel). [2288]

1917 Alldays-Allen, 2½ h.p., mag., countershaft, lamps, Klaxon, nearly new; 46 gns.—Wandsworth Motor Exchange, Ebner St., Wandsworth (Towd Station). [2029]

Ariel

COUNTERSHAFT Ariel, well equipped, as new; 68 gns.—224a, Clapham Rd., S.W.9. [1745]

CROW Bros., High St., Guildford—Ariel agents since 1913, 1919 deliveries have begun. [5299]

ARIEL, 3½ h.p., 1913, fine condition; £40.—Hampden, Burchetts Farm, Ockley, Surrey. [2222]

ARIEL, 3½ h.p., T.T. sporting model; after 6.—10b, Peabody Sq., Blackfriars Rd., London, S.E. [2165]

1916 Ariel, 3½ h.p., 3-speed, and sidcar, little used, excellent condition; £100.—H.M.D., 51, High St., Oxford. [1870]

ARIEL 1911 3½ h.p., free engine and variable gear, all accessories, ride away; £25.—Write 26, Parkhurst Rd., N.7. [1925]

ARIEL, 3½ h.p. and 6-7 h.p.; early deliveries.—F. Speakman, Ariel Expert, 7, Rochdale Rd., Harpurhey, Manchester. [5269]

ARIEL, 1912, 3½ h.p., 2-speed Pitfall gear, mechanically perfect, first tyre still on front wheel, 500 miles since 1913; best over £35.—Bell-Patterson, Ecclefechan. [X1897]

1916 Ariel 6 h.p. Combination, Best speedometer, lamps and horns, spares, including engine bushes, in perfect condition and running order; £100.—Althra, South Elmsall, Pontefract. [X1544]

A.S.L.

1914 A.S.L., T.T., 5-6 h.p., adjustable pulley, Bosch mag., Pannier engine, perfect except tyres, too fast for owner, do over 60 m.p.h. in North Staffs. hills; £45, or nearest.—Pinnick, Bottom House, near Leeg, Staffs. [X1719]

Auto-Wheels.

WALL Auto-Wheel, little used; £10/10.—148, Melton Rd., Thornton Heath. [1856]

WALL Auto-Wheel, all fittings and spares, in tip-top order; £10.—Scholefield, Middlewich. [X1354]

AUTO-WHEEL, hardly been used, good condition; £15.—Shearston, Leadhall Lane, Harrogate. [X1721]

AUTO-WHEEL, attached 3-speed Raleigh, new tyres, ready to ride; £15.—7, Kingsley Rd., Bedford. [1878]

WALL'S Auto-Wheel, in good order; 11 gns. no offers.—B. Slessor, Banca, Lunnay, Aberdeen-shire. [X1351]

AUTO-WHEEL (Wall), good order; 10 gns.; also tandem, lady-back.—Brav, 644, High Rd., Netherby Terminus. [1944]

AUTO-WHEEL, perfect order; £14; bring cycle and ride away.—Hall, next Green Man Hotel, Whetstone, N.20. [1742]

AUTO-WHEEL, just tuned by expert, does 25 m.p.h.; £10/10.—Bewers, 10, Hazelgrove Rd., Hayward's Heath, Sussex. [1891]

AUTO-WHEEL, splendid condition, mechanically and enamel, also new spare tyre; 11 gns.—4, Approach Rd., St. Albans. [2041]

WALL'S Auto-Wheel and gent's bike, in good running order; £12, or separate.—4, Kersley Mews, Batterssea, S.W.11. [1722]

AUTO-WHEEL, 1916 B.S.A. Model de Luxe, as new, not done 300 miles; £16/16, no offers.—74, Park Rd., Dulwich, S.E. [1975]

WALL Auto-wheel, perfect; £8/10; or complete with gent's cycle, fitted new tyres and tubes, £13/10.—Witts, Royston, Herts. [X1853]

WALL Auto-wheel, attached lady's B.S.A. bicycle, new; cost 36 gns.; what offers? must sell.—Box 5,060, c/o The Motor Cycle. [X1535]

WALL Auto-Wheel, Model de Luxe, and gent's 3-speed cycle, good running order, good climber; £16/10.—72, Panton St., N.1. [1976]

Bat.

5-6 h.p. Bat C.B. Combination, 2-speed gear, clutch; £40.—D.5, Christ's, Cambridge. [X1727]

1914 Bat-Jap 5-6 h.p. Combination, in good condition; bargain, 70 gns.—"Alverton," Gipsy Lane, Wokingham. [X1584]

£90; Bat-Jap 8 h.p., with very fine sidcar, 3-speed gear, lamps, speedometer and spares.—Seen any time at 237, London Rd., Southend-on-sea. [1961]

BAT-J.A.P., 6 h.p. twin, C.B. combination, 3-speed, spring frame, clutch, lamps, etc.; first cheque £55 secures; absolutely perfect.—North, 37, Montpelier Crescent, Brighton. [X1953]

BAT-J.A.P., 8 h.p., 1914, 2-speed, kick starter, and Canelet c.b. sidcar, hood, screen, lamps, horn, whole outfit stove enamelled black with grey tank, mudguards, and s.c. body. Binks carburetter, 6-60 m.p.h. on top, a really splendid and smart outfit; £90.—Oliver, Braitham Lodge, Friars Place Lane, Acton, W.3. [X1929]



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8 h.p. New Imperial
MOTOR CYCLES,
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Sidcars extra.

These machines are absolutely new
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Piston Rings for the following engines in stock:

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2½ h.p. Levis pattern ...	62	.. 1	.. 1/6
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		mm.	
2½ h.p. Douglas pattern .	60	.. 4	.. 1/3
4 h.p. Douglas pattern ..	75	.. 5	.. 1/6
3½ h.p. P. & M. pattern .	82.5	.. 6	.. 1/9
4 h.p. Precision Single pattern	85	.. 6	.. 1/9
8 h.p. Precision Twin pattern			
2½ h.p. A.J.S. pattern ..	74	.. 5½	.. 1/6
6 h.p. A.J.S. pattern ...	74	.. 5½	.. 1/6
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MOTOR CYCLES FOR SALE.

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6 h.p. Bat Coachbuilt Combination, 2-speed counter-shaft, clutch, spring frame, accessories, excellent condition; £65; Canelet chassis; £3; cane body, 10/-—Gerard, 10, Belmont Av., Edmonton. [2023]

Blackburne.

CROW Bros., High St., Guildford, are old Blackburne agents, and can give early deliveries. [5300]

BLACKBURNE—Sole agents. Book now for early delivery.—Chandler, Reyre and Williams, Sun St., Hitchin. [0999]

BLACKBURNE, 3½ h.p., 1914, Bosch, Seaspray, good condition, reliable; £50, or best offer.—Smith, Westacre, Droitwich. [X1553]

JONES' Garage.—We can accept orders for all models of Blackburne motor cycles; delivery expected in April; deposits optional.—Broadway, Muswell Hill. [0992]

Bradbury.

BRADBURY 1914 4½ h.p., Gradina gear; £40, lowest.—131, Western Rd., Southall. [1850]

BRADBURY, 1914, clutch model, good condition, tyres and belt, sound; £39.—32, Pairaces Rd., Oxford. [X1832]

BRADBURY, 1912, Armstrong 3-speed, kick starter, B. and Wolbrown sidcar; £45.—Porritt, Stationer, Heckmondwike. [X1862]

BRADBURY, 4 h.p., Bosch, 2-speed, lamps, etc., ride away; first cheque secures; £45.—Slinn, 147, Peter St., St. Helena, Lanca. [X1568]

BRADBURY 4 h.p., light coachbuilt sidcar, 2-speed N.S.U., Bosch, splendid condition; £52/10, bargain.—135, High Rd., Wembley. [X1754]

4 h.p. Bradbury, 1913, fixed engine, excellent order throughout, unused 3 years; £30.—Booker, 13, Gladstone Terrace, Epping. [1940]

1914 Bradbury Combination, 4½ h.p., N.S.U., set Lucas lamp, horn, splendid condition.—43a, Arrow Rd., Devons Rd., Bow, E.3. [2155]

BRADBURY—For the earliest possible deliveries of 1919 models try the sole Manchester agent, Tom Davies, 229, Deansgate, Manchester. [6652]

BRADBURY, 4 h.p., 2-speed, free engine, pedal starter, perfect order; £30.—Saturday afternoon or Sunday, 1, Cotswold St., West Norwood. [2056]

BRADBURY, 4 h.p., single speed, enamel and plate as new, tuned for speed; bargain, 40 gns.—The Haven, 120, Sutherland Rd., West Croydon. [1994]

BRADBURY, N.S.U. 2-speed, guaranteed sound, and take sidcar easily; £52, or with Brampton gear (needs changing) £26.—42, Priory Av., Walthamstow. [X1914]

6 h.p. Bradbury 3-speed Combination, 1914, Binks carburetter, 2 new covers, in good running order, only kick starter not in order; price £55.—Rogers, St. John St., Whitford, Wigtownshire. [X1792]

BRADBURY, 4 h.p., T.T. model, 1913, new belt, tyre and tube, perfect condition; £38.—Acy trial during weekends at W. Daveyport's, Whitechurch Rd., Banbury, near Tarporley, Cheshire. [X1859]

BRADBURY, 1913 (autumn), Villiers free engine, Bosch, good tyres, belt, tools, Miller lamp, generator, Lucas horn, 3,000 miles, splendid condition; offers.—Price, Gwalla, Llanwrtyd Wells. [X1641]

4 h.p. Bradbury (1913), free engine, enclosed valves, speedometer, good tyres and belts, lamps, tools, spares, everything ready for road; only wants seeing; seen any time; £42.—35, Halsew Rd., Greenwich, S.E.10. [2205]

Brough.

BROUGH early deliveries, sporting mount.—J. Blake and Co., Liverpool and Manchester. [X0459]

Brown.

3 h.p. Brown, mag., Druids, B.B.; £22; sound tyres. £2.—13, New St., Wellington, Salop. [X1719]

BROWN 3½ h.p. Coachbuilt Combination, 2 speeds; £32/10.—Doussell, 32, Market St., Maidenhead. [X1533]

BROWN 3 h.p., full accessories, in good running order; £30, near offer.—Job, 16, Florian Rd., Putney. [X099]

BROWN 3½ h.p., Dixie waterproof mag. to fit, must sell; 10 gns.—Kemp, Maypole, Southminster, Essex. [2170]

BROWN, 2½ h.p., U.H., B. and B., good tyres; seen running; £20.—McLeod, c/o G. Millers Terrace, St. Monance, Fife-shire. [X1579]

BROWN 3½ h.p. 3-speed Combination, hand and foot clutch, new October, 1914, with lamps and all accessories; 55 gns., no offers.—5, Rainham Rd., Kenal Green, N.W.10. [2019]

BROWN 3½ h.p., Bosch, Seaspray, running order, overhauled; good wicker sidcar; 5-6 h.p. twin frame and accessories; for quick sale cheap.—87, New Park Rd., Brixton. [2283]

B.S.A.

B.S.A.—Early deliveries from Turner Bros., 154, Upper Thames St., London, E.C. [1928]

NEW B.S.A.'s to stock; immediate delivery Model K.—Alexander, Agent, Wallasey Village. [1506]

B.S.A. 2½ h.p., like new; £36; lamps, horn, Dunlop tyres.—259, Brownhill Rd., Catford, S.E.6. [1971]

MOTOR CYCLES FOR SALE.

Enfield.

ENFIELD 1916 6h.p. Combination; £120.—29, St. Leonard's St., Bromley-by-Bow. [X1322]

6h.p. Enfield Combination, 2-speed, Bosch twin, etc.; 275.—Barnsdall, Dig St., Ashbourne. [X1322]

ENFIELD 2½h.p. Twin, splendid order; 35 gns.—Saker, 42, Hanover Park, Peckham, S.E. [1853]

3h.p. Enfield, 1914, 2-speed, kick-start; £48, no offers; after 6.—31, Richmond Ter., Kennington Gate. [X2336]

ROYAL Enfield Twin, disc wheels, 2-speed; £45.—Skew, Wenham House, Woodbridge Rd., Guildford. [1811]

ENFIELD 2½h.p. 1913 Twin, 2-speed, Bosch, recently overhauled, good condition; £35.—West, Avenue, Dunmow. [X1807]

ENFIELD 2½h.p. Twin, perfect running order; £35.—Write particulars, Walker, Manor Croft, Worksop, Notts. [X1928]

ENFIELD 2½h.p., 2-speed, new tyres, chain drive; £36.—25 St. Margaret's Rd., Elmers End, Beckenham, Kent. [X1807]

1914 3h.p. Enfield, 2 speeds, new tyres, just overhauled, equal to new; £45.—Stratton, Evesham St., Redditch. [X2132]

2½h.p. Enfield, 1911, complete with pedalling gear; 4 Bosch mag.; £12.—Copus, Palmers Cross, Bramley, Surrey. [X211]

1916 Enfield Combination, 8h.p., electrical lights guaranteed perfect; £125.—45, Bow Common Lane, London. [X2091]

1914 Enfield twin, 2½h.p., 2-speed, F.E. chain drive, new Dunlops, perfect; £45.—48, Prince George Rd., N. [X2333]

1915 3h.p. Enfield, 2-speed, kick start, lamp and horn, good condition; £50.—Wheeler, 61, Burley Rd., Sittingbourne, Kent. [X1230]

ENFIELD Combination, 6h.p., mileage under 8,000; £70; no offers. Evenings.—Rowe, Arnwold, Cliffsea Grove, Leigh-on-Sea. [X2104]

ENFIELD 3h.p. (late model), 2-speed, clutch, kick starter, Amac, lamps, beautiful condition; 55 gns.—65, Solon Rd., Brixton. [X2012]

ENFIELD Combination, mileage 1,000, perfect, speedometer, 3 lamps; best over £130.—Box 3,074, c/o The Motor Cycle. [X1890]

ENFIELD 1914 6h.p. Combination, good condition; £90; seen in Stafford by appointment Saturday or Sunday.—Macadam, Gool Batts, Eccleshall, Staffs. [X1491]

1917 Enfield Combination, 6h.p., new condition, horn, speedometer, head light, generator, spare tube; 125 gns.—59, Central Park Rd., East Ham. [X2042]

ENFIELD 3h.p. Twin, 2-speed, splendid condition; £52/10; also 3-speed and reverse gear box, suit belt drive cycle car, £7.—13, Osberton Rd., Retford Notts. [X1846]

ENFIELD Lightweight 2½h.p. twin, 2 speeds, chain driven, Bosch mag., B. and B. carburettor, nice order; £35.—Bate, Brook Lynn, Golborne, Newton-le-Willows, Lancs. [1947]

ENFIELD 3h.p., late 1916, brought up-to-date, new wide tank, front belt rim brake, new rear Dunlop, lamp set, horn, all tools; 60 gns.—Letters, Smith, 19, Princes Sq., Bayswater. [1890]

ROYAL Enfield Combination, 6-8h.p., late 1917, not done 250 miles, absolutely as new and guaranteed, all hills on top 3 up; £135.—George, 28, Burgate, Canterbury, Kent. [X1835]

1919 Enfield 2½h.p. 2-stroke, 2-speed, mileage under 100, with second-hand head lamp and generator, horn, mirror, watch and holder; complete, £54.—Box 3,073, c/o The Motor Cycle. [1847]

1916 Enfield Combination, new condition, lamps, tools, horn, reflector, speedometer, wind screen, apron, clock, foot warmer, spring luggage grid, spare tyre, 2 tubes, chains, etc.; £120.—103, Finchley Rd., N.W.3 [X1834]

ENFIELD 1916 6h.p. Combination, with hand Klaxon and speedometer, but no lamps, almost new condition, overhauled, fast, excellent appearance, and well treed; lowest price £110.—The Layton Garages, Bicester, Oxon. 'Phone: 35. [1939]

LATE 1917 Enfield Combination, 8h.p., Lucas dynamo lighting, Cameo wind screen, new light car tyres and tubes all round, beautiful condition, perfect 1155 or modern lower power part.—Rose, 14, Cyprus St., Globe Rd., Old Ford Rd., N.E. [X2067]

Excelsior.

AMERICAN Excelsior; place orders now.—J. Blake and Co., Liverpool and Manchester. [X0441]

EXCELSIOR 7-9h.p., with coachbuilt sidecar, in good condition; price £110.—Heckford, 25, Frederick St., Birmingham. [X1955]

EXCELSIOR 3½h.p., good tyres and belt, B.B. carburettor, X'fall saddle and forks, Bosch mag., only requires fitting; £12.—E., Bantworth, The Crescent Belmont, Sutton. [1935]

1915 American Excelsior Combination, 7-9h.p., navy blue, C.B. sidecar, 3-speed, kick start, dynamo lighting, electric horn, 750×90 tyres, nearly new; £100.—Charles, Baker, Landore, S. Wales. [1852]

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700×80 heavy ribbed	55/-	71/3
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26×2 ... 6/-	8/9	28×3 ... 10/-	13/6
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266 Victoria, 1.

MOTOR CYCLES FOR SALE.

Excelsior.

AMERICAN Excelsior Combination, 1916, complete with dynamo lighting, speedometer, horn, not done 1,500 miles; any trial £120.—Crabb and Fisher, Water Lane, High St., Watford. [X1771]

Fafnir.

FAFNIR 3½h.p., free engine, lamps, horn, new tyres, Bosch mag., accessories, guaranteed perfect; £20.—45, Bow Common Lane, Bow, London. [X2089]

F.N.

4-CYL. F.N., 5-6h.p., single speed, in running order. —104, Plough Rd., Battersea. [X2123]

F.N. 4-cyl. Motor Cycle, sound running order; £28/10. —133, Camberwell New Rd., S.E.5. [X2080]

1911 F.N., 4-cyl., in good order; bargain, £30.—Earl, The Vale, Hampstead, N.W.3. [X2158]

F.N. 2½h.p., 2-speed, shaft, little used, in fine condition; £20.—Bellairs, Braugore, Christchurch. [X1992]

F.N., 5-6h.p., shaft drive, engine tuned up, new tyres, Bosch mag., take sidecar; £20.—E. Fowler, Arlessey, Beds. [X2225]

F.N., late model, 5-6h.p. 4-cyl., enclosed, Bosch, 2 speeds, disc clutch, dropped frame, enamelled red; bargain, 58 gns.—Below. [X2031]

F.N. 4½-5h.p., 4-cyl., mag., dropped frame, nearly new tyres; 36 gns.—Wandsworth Motor Exchange, Ebner St., Wandsworth (Towar Station). [X2031]

5h.p. 4-cyl. F.N., fixed gear, drop back frame, re-enamelled, new tyres, new gudgeon pins, and all bearings taken up, new condition; £30, or offer, bargain.—Holloway, Lee Cottage, Stapleton, Bristol. [X1943]

F.N., 2½h.p., 2-speed, clutch, Bosch, B. and B., engine just overhauled, perfect running order, will plate and enamel to suit purchaser; ready in two weeks after purchase; £38.—Toms, 36, Matlock Rd., Caversham. [X2166]

Gradior.

GRADIOR 2½h.p. Light Motor Cycle, F.N. engine, Palmers, Brooks, spring forks; £24.—Jervis, 3, Common Rd., Stafford. [X1884]

Grandex.

GRANDEX-PRECISION, 2½h.p., 2-speed; bargain, £30.—Earl, The Vale, Hampstead, N.W.3. [X2159]

2½h.p. Grandex-Precision, mag., Druids, now built; £24.—13, New St., Wellington, Salop. [X1760]

GRANDEX-PRECISION, 1914, 2h.p., 2-speed, lamp, generator, not used since March, 1917; £20, or near offer; seen any time before 9.30.—78, Mitford Rd., Kingsdown Rd., Holloway, N. [X1548]

GRANDEX Special, 1915, 4½h.p., Precision, 3-speed, kick start, clutch, drip feed, etc., and coach sidecar, wind screen, luggage and petrol carriers, any trial; would separate; best over £65.—2, Linden Villas, Prince's Rd., Weybridge. [X2005]

1914 Grandex-Precision, 4½h.p., powerful, 3 speeds, clutch, T.T. bars, lamps, horn, 2ft. 10in. copper exhaust, speedometer (not in working order), also fur-lined sheep's-wool mackintosh; £45; giving up riding.—W. Pattison, Twydale Crossing, Gillingham, Kent. [1900]

Harley-Davidson.

HARLEY-DAVIDSON 1915 Combination; £75; seen by appointment.—Arthur Cann, Lake Villa, Bradworthy, North Devon. [X1728]

HARLEY-DAVIDSON Combination, 7-9h.p., late 1915, new coachbuilt sidecar and tyres, splendid condition, Bosch mag.; £30.—122, Coventry Rd., Ilford. [X2166]

1915 Harley Combination, 3-speed, mag., model, splendid condition; 110 gns.; modern solo considered part exchange.—Grasmere, Glencaira Park Rd., Cheltenham. [X1986]

HARLEY-DAVIDSON, late 1915, 11h.p., complete with coachbuilt sidecar, standard grey colour, excellent condition; £125, or nearest offer.—James Garages, Church Stretton. [X1900]

HARLEY-DAVIDSON 7-9h.p., late 1915 electric model, lamps and horn, speedometer, clutch, 3-speed, kick start; £30.—Curtis, 18, St. Thomas Rd., Finsbury Park, N.4. [X2004]

HARLEY-DAVIDSON Combination, 1916, 3 speeds, dynamo lighting, electric horn, spare chains (unused), hood, screen, original tyres, unused 2 years; £140; any trial.—37, Meath Rd., Ilford. [X2162]

HARLEY-DAVIDSON Combination, late 1915, electrically equipped, mag., model, good condition throughout, ready ride away; £115; good solo taken part exchange.—J. C. Plipp, Sherston, Wilts. [X2108]

HARLEY-DAVIDSON 7-9h.p., 1917, sidecar, 3 speeds, clutch, kick starter, mag. ignition, C.A.V. lighting set, recently overhauled, tip-top condition, very fast; would change for Douglas 2½h.p. and cash on agreement; £150.—H. O. Moller, School House, Felstead, Essex. [X1790]

1919 Electric Model Harley-Davidson, just delivered, special sidecar with child's seat, electric side light, speedometer, wind screen, Cape hood, hood bag, etc.; best offer over £200 secures; cost considerably more than sum mentioned; full insurance included.—Write, H.D., 48, Alconbury Rd., Brook Rd., Clapton, E.5. [X1851]

1919 Electric Model Harley-Davidson, just delivered, special sidecar with child's seat, electric side light, speedometer, wind screen, Cape hood, hood bag, etc.; best offer over £200 secures; cost considerably more than sum mentioned; full insurance included.—Write, H.D., 48, Alconbury Rd., Brook Rd., Clapton, E.5. [X1851]

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MOTOR CYCLES FOR SALE.

Harley-Davidson.

HARLEY-DAVIDSON Combination, 7-9-h.p., 1915, electric model, little used, and in first-class condition; £125; lightweight solo as part exchange considered.—Daniels, 46, Upton Lane, Forest Gate, E.7. [X1340]

Hazlewood.

BARGAIN.—2½-h.p. 3-speed Hazlewood (J.A.P.), splendid condition throughout; £30.—Arlington, Lewes. [1873]

Henderson.

HENDERSON 4-cyl.—Official distributors, J. Blake and Co., Liverpool and Manchester. [X0439]

HENDERSON.—Cygnet Rear Car for Henderson, as in "The Motor Cycle," March 6th, new, first one in England. Cape top, front screen for driver, 28in. x 31in. Good year, blue streak, owner in similar car 47 p.h. with 2 adults and 2 children in car; on view Colmore Motor Cycle Depot, Paradise St., Liverpool; £45, or would exchange for any good make 4 or 5-h.p. cycle.—Croucher, 1, Oxford Rd., Southampton, (D) [9622]

Hobart.

HOBART, 1914, 2½-h.p., 3-speed, clutch, with dropped frame, good condition, really cheap, 32 gns., carriage paid.—Wilson, 36, Coney St., York. [2227]

Humber.

1914 Humber, 3½-h.p., 3-speed, good condition; 50 gns.—Swain, Southam Rd., Banbury. [1734]

1914 Humber, Rock gear, 3½-h.p., good condition; £30.—J. S. Nicholas, Yerboston, Begelly, Pen. [X1401]

HUMBER 3½-h.p., 2-speed, almost new, perfect order; £35.—Purnell, Worcester St., Kidderminster. [X1527]

2 h.p. Lightweight Humber, not done 1,000 miles, enamel, etc., as new, good goer; £32.—Scholefield, Middlewich. [X1335]

3 h.p. Humber, 3-speed Outfit, just overhauled, all working parts as new; £70.—J. Burfoot, Woodhouse, Andover. [2211]

HUMBER Lightweight, Danlows, R. and B., Eisenmann mag., recently tuned; £26.—6, Royal Terrace, Southport. [X1780]

3 h.p. Humber, chain drive, perfect running order; 31 first cheque £16 secures.—309, Two Mile Hill, Kingswood, Bristol. [2179]

HUMBER 3½-h.p., 3 speeds and clutch, coachbuilt sidecar and spares, splendid condition; accept £65.—E., 277, Camberwell Rd., S.E.5. [2187]

2 h.p. Twin Humber, 3-speed, F.E., new cyl., piston, 24 pulley, tyres and belt recently fitted; £30.—Hunter, 1, Barton Rd., Walton, Liverpool. [X1852]

3 h.p. Humber and C.B. sidecar, S.A. 3-speed hub and clutch, splendid condition; any trial; £60.—Greenwood, 40, Kidderminster Rd., Croydon. [1921]

HUMBER 1915 3½-h.p. Combination, 3-speed, clutch, K.S., Millford C.B. sidecar, 3 lamps, horn, speedometer, perfect condition, as new; £90.—8, St. George's Av., Ealing. [2258]

HUMBER 6-h.p., water-cooled, brand new, all-black combination, 3 lamps, F.R.S. accumulator set, Easting wind screen, and spares; £140.—Barns, Drummondhill, Inverness. [1781]

1917 3½-h.p. Flat Twin Humber and Sidecar, 3-speed countershaft, all chain, clutch, tyres and lamps new; £80. After 7 p.m.—Roden, 5, Burton Av., Watford. [2103]

3 h.p. Humber Combination, 2 speeds, handle start, 32 trial any hill, engine, enamel, plate, perfect, £50; also Fulford cane body, £1; no offers.—43, Westward Rd., Chingford. [2252]

1914-15 Humber 3½-h.p. Combination, 3-speed, kick start, clutch, superior roomy underslung coachbuilt sidecar, the whole unscratched, stored; £75.—Write, C.C.F., 2, Madeira Park, Tunbridge Wells. [2027]

HUMBER 3½-h.p., 2-speed, handle start, lamps, horn, tools, and coachbuilt sidecar, ready for road; best offer over £55 seen 8.30 a.m. to 1.30 p.m., or after 6 o'clock.—A. Florence, 1a, Farnham Rd., Hopton Rd., Streatham. [1723]

Indian.

INDIAN, 7-9-h.p., 2 speeds, coachbuilt sidecar; 85 gns.—245, Hammersmith Rd., W.6. [2215]

INDIAN, 5-6-h.p., clutch model, running order; £39.—Costa, 1, Victoria Rd., Brighton. [2186]

POWERPLUS Indian Combination, smart lot, fast; 125 gns. 245, Hammersmith Rd., W.6. [2214]

INDIAN 5-6-h.p. 1915 Combination, perfect order; £110.—Box L1.533, c/o The Motor Cycle. [2310]

5-6-h.p. Indian, 1915, clutch model, sporting combination, 3 speeds; £70.—112, Bury Park Rd., Luton, Beds. [2021]

INDIAN 7-9-h.p. Clutch Model, lamps, mechanical horn, good condition; £50.—Bromley Oswell, Hadley, Salop. [X1788]

INDIAN Combination 7-9-h.p., electric light set, good condition; £83; after 3 p.m.—74, Bramblebury Rd., Plumstead. [1979]

1915 Indian, 5-6-h.p., 3-speed, hand and foot clutch, kick starter, long exhaust, excellent condition; best offer over £65.—New, Ridgmont, Farnborough, Hants. [2156]



"Deliveries in Sequence."

In consequence of the limited output and spasmodic deliveries of motor cycles during the present "Reconstruction Period," we regret it is not possible to quote our clients more than approximate delivery dates. We are, however, able to assure intending purchasers that we are in a position to supply with a minimum of delay, as our contracts for all the most desirable machines are large, and were placed early enough to ensure preference. We shall be pleased to give the fullest possible information concerning the following, and if your order is placed with us, you will have the advantage of knowing that you will receive absolutely fair treatment, as we do not, under any circumstances, depart from our indelible rule of "Deliveries in Sequence."

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A.B.C., 3 h.p.

ARIEL, 3½ h.p.

ARIEL, 6 h.p.

BLACKBURN, 2½ h.p.

BLACKBURN, 4 h.p.

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MOTOR CYCLES FOR SALE.

Indian.

5-6-h.p. Indian Combination, clutch model, just being overhauled; £48/10.—Atkinson, Glaeshouse Mills, Pateley Bridge. [X1574]

INDIAN 7-9-h.p., 1914, clutch, very fast, excellent condition; £60 lowest; after 6 p.m.—Richardson, 74, Tulse Hill, S.W.2. [1996]

INDIAN, 5-6-h.p., lamp, horn, accessories, fast and powerful, excellent condition, like new; £55.—Box 3,065, c/o The Motor Cycle. [X1730]

LIVERPOOL and District Agents for Indian. Place orders new to secure early delivery.—Victor Horsman, Ltd., 9, Parr St., Liverpool. [0002]

1915 Indian, Millford sidecar, 7-9-h.p., road racer, clutch model, speedometer, lamps, and horn; £70.—10, Stockwell Park Rd., Clapham. [1817]

INDIAN, 1915, 7-9-h.p., 2-speed, clutch, kick start, spring frame, good order; £65; Douglas part exchange.—Graham, Sorig Rd., Wrexham. [1968]

INDIAN, 4-h.p., clutch model, spring frame, overhauled, re-enamelled, equal new, fast, smart machine; £45.—Hyde, Burnside, Shere, Surrey. [X1854]

1915 (late) 7-9-h.p. Indian Combination, hood, screen, electric lamps, horn, just overhauled, unused since 1917; 90 gns.—Hills, 18, Albert Rd., Canterbury. [1784]

1915 Indian, stored 3 years, 3-speed, clutch, kick start, 7-9-h.p., lovely condition; £78.—Apply, Brynmaer, Throley Rd., Sutton, Surrey, after 6 p.m. [2239]

1915 Indian, spring frame, 7-9-h.p., 3-speed, and Mills-Fulford coachbuilt sidecar, excellent machine, good tyres; £100.—S. B., University College, Oxford. [1869]

INDIAN 7-9-h.p. Powerplus, late model, and smart Bramble sidecar, good condition throughout; privately owned; what offers?—J. Barker, Lyth Hill, Shrewsbury. [X1726]

1915 Model C Indian, overhauled by manufacturers this month, combination, 7-9-h.p.; £125, or would consider exchange for new Ford car.—Cole, 198, High Rd., Ilford. [1885]

INDIAN 7-9-h.p. T.T., 2-speed, clutch model, garaged 3 years, thoroughly overhauled, very fast, lamps, horn, etc.; first £60 secures.—Rutland, 18, Deodar Rd., Putney, S.W. [1981]

WHAT Offers for nearly new Indian and sidecar, every possible accessory, spare handle-bars, etc.—Chamfer, The Junipers, Woodmansterne, Surrey. Tel.: No. 5 Burch Heath. [1860]

MY Pet Indian, 1916, 7-9-h.p. T.T., will do 70 m.p.h., bought new 1917, plating, enamel, tyres, perfect; £80 or nearest.—Tapstone, Church Rd., Farnborough, Hants. [2009]

INDIAN 1914 T.T. Clutch Model, speedometer, lamps, accessories, perfect order, very fast, owner returning New Zealand; £65.—Berks, Bridge St., Walton-on-Thames. [2048]

7-9-h.p. Indian, 1915 (October), road racing model, clutch, B. and B. carburettor, recently thoroughly overhauled; £65; after 6 p.m.—Weeden, Lynden House, Benhill St., Sutton, Surrey. [2073]

INDIAN 5-6-h.p., 3-speed, and clutch model, absolutely first-class machine, as new, fast, silent, and powerful; £80.—Aeroplanes Manufacturing Co., Albion Works, Albion St., King's Cross, London, N.1. [1933]

INDIAN Combination, 3-speed, 1915, 7-9-h.p., completely equipped, English controls, lamps, etc., magnificent condition and appearance; £115.—Longman Bros., 17, Bond St., Ealing. Phone: 1578 Chiswick. [2085]

LATE 1915 7-h.p. Indian Powerplus, 3 speeds, K.S., hand and foot clutch, torpedo sidecar; reason selling, too fast for owner; £100, or exchange lighter combination; seen any time between 3 and 5.—Persson, 56, Lower Kennington Lane, S.E. [1855]

RED Indian 1914-15 Combination, spring frame, 2-speed clutch, new tyres, speedometer, lamp sets, hood and screen, owned and driven by an engineer; best offer over £90.—71, South Side, Clapham Common, S.W. Phone: 322 Brixton. [2180]

Ivy.

2 h.p. Ivy 2-stroke, late 1915; £35; give cash, ex-2 change Indian.—1, Percy Rd., Hampton, Middlesex. [1920]

1914 4-h.p. Ivy-Precision, 3 speeds, clutch, coachbuilt sidecar, powerful; any trial; £65.—Wadlow, Chislehurst Rd., Orpington. [2233]

James.

JAMES 1914 big single 4½-h.p., 3-speed, F.E. combination, C.B. powerful; £78.—48, Prince George Rd., N. [2334]

JAMES.—Sole agents for Hertfordshire, 1919 machines in stock.—Chandler, Reye and Williams, Sun St., Hitchin. [0997]

3 h.p. 3-speed 1913 James Canoelet Combination, 32 Bosch, sound condition, only done 1,500 miles, engine just overhauled; £65.—Seen, 189, Gt. Western Rd., Aberdeen. [X1885]

JAMES 4½-h.p. 3-speed 1916 Combination, coachbuilt Canoelet sidecar, with extra silencer, recently overhauled at a cost of £20, lamps, horn, and speedometer; £78; seen at any time by appointment.—Wright, 16, Cazenove Rd., Stoke Newington, N.16. Phone: Dolston 2429. [1879]

MOTOR CYCLES FOR SALE.

P. and M.

P. AND M., just delivered, mounted, lamps, horn; having car; best offer over £85.—Box 3,057, *c/o The Motor Cycle*. [X1329]

P. AND M., 3½ h.p., wicker sidecar, 2-speed, clutch, kick start, accessories: £60; stored since 1916.—The Hawthorns, Gerrard's Cross, Bucks. [1836]

P. and M., 2-speed, Bosch mag., P. and M. carburettor, in good running order: £50, first cheque secured.—Mr. F. Upton, 25, Monk Bridge Rd., Headingley, Leeds. [1727]

Peco.

PECO 2-stroke, 2½ h.p., in good running order, 2-speed countershaft, tyres good, 1,900 miles, with lamps; 45 gns., or nearest.—63, Conway Rd., Southgate, N.14. [2305]

Peugeot.

5-h.p. Peugeot Twin Coachbuilt Combination, 2 speeds, Bosch, B. and B.; 48 gns.; trial by appointment.—Gibson, 101, Springbank Rd., Hither Green, London. S.E.13. [2265]

P.F.

P.F. 6-h.p. Twin Combination, wicker sidecar, chain drive; £28, offers.—Joyce, 1, Soitoris Rd., Rushden. [1741]

Precision.

1914 Precision 4½ h.p., Chatter-Lea frame and wheels, Bosch mag., adjustable pulley; £35.—7, Alma Rd., Enfield Wash, Middlesex. [X1747]

TORPEDO-PRECISION 2½ h.p., good running order, new belt, C.A.V. mag., lamps, horn; bargain, £25.—Heath, 2, Roshon Rd., Burslem. [X1946]

2½ h.p. Precision, late 1914, 3 speeds, clutch, complete with spares and lamp; £40, no offers.—Karu, 4, Cornwall Parade, Church End, Finchley. [1893]

Premier.

PREMIER, 3½ h.p., 3-speed, clutch, in perfect order; £45.—10, Milton Rd., Old Ford, E.5. [1894]

PREMIER Lightweight Clutch Model, good tyres; accept £34/10.—E., 277, Camberwell Rd. [2188]

PREMIER and Sidecar, 7 h.p., 3-speed, clutch; ride away; £55.—19, East St., Bexley Heath. [X1487]

PREMIER, 2½ h.p., 2-speed, Bosch, B. and B., perfect machine; £39.—13, Victoria Rd., Deal. [X1791]

PREMIER 3½ h.p., Sturmer 3-speed, clutch, been stored; £40.—Box L1537, *c/o The Motor Cycle*. [2314]

PREMIER 3½ h.p., T.T. engine, Philipson pulley, powerful machine; £45.—15, Wickham Rd., S.E.4. [2243]

3½ h.p. Premier fast and reliable, Bosch, splendid condition; 35 gns.—18, Kelmere Grove, East Dulwich, S.E. [1997]

PREMIER, 2½ h.p., condition as new, Bosch mag., new covers, low mount; £32; after 7.30.—147, Ravensbury Rd., Earlsfield, S.W. [1864]

PREMIER, 3½ h.p., 3-speed, 1914 model, excellent machine; £52.—Longman Bros., 2, King's Parade, Acton. Phone: 1873 Chiswick. [2088]

PREMIER 7-h.p. Twin, 3-speed gear box, kick start clutch, Ivy sidecar, hood and screen, really beautiful outfit, sonad; £110.—Longney, Oswestry. [X1939]

PREMIER Coachbuilt Combination, 1914, 3½ h.p., 3-speed, clutch, hood, screen, stored during war, first-class condition £70.—Highfield, Chase, Conisdon, Sarrey. [2092]

PREMIER 3½ h.p., 3-speed, clutch, with sporty torpedo sidecar, side entrance, luggage and petrol carrier, good condition, stored 3 years; £45.—136, Oakfield Rd., Penge. [1927]

PREMIER 3½ h.p., 3-speed, clutch, Bosch, new belt, new tyres, gears and motor been thoroughly overhauled, complete with coachbuilt sidecar; £65.—Isaac Richards, Rhosymedre, Rhonon. [X1776]

PREMIER, 3½ h.p., 3-speed, h.h.c. clutch, Watford, mirror, horn, P.H., Bosch, Senspray, new tyres and belt, tools, spares, stored 2 years; call after 6 p.m.—Howse, 37, Warrington Crescent, Maida Vale. [X1583]

3½ h.p. Premier and Sidecar, Grado gear, Simms mag., engine recently rebushed, lamps, horn, and spare tyre; 38 gns.—Edwards, 76, Hunterhouse Rd., Sheffield. [X1849]

PREMIER 3½ h.p., 1914, countershaft, coachbuilt combination, wind screen, apron, luggage carrier, electric lighting, tools, spares, new Dunlops; £65.—109, Onslow Gardens, Wallington, Surrey. [2072]

PREMIER, 1913-14, in fine condition, 3½ h.p., stored 4 years B. and B. carburettor, Bosch mag., clutch, pedal start, P. and H. lighting set, tyres good, ready to ride anywhere; best offer over £40 has it; buying lightweight.—168, Risley Av., Bruce Grove, London. [X1935]

Quadrant.

4½ h.p. Quadrant and wicker sidecar, 3-speed, clutch, Bosch, B. and B., lamps; ride away; 40 gns.—Entwistle, Knockhall House, Greenhithe, Kent. [X1485]

QUADRANT, 3½ h.p., enclosed Bosch, B. and B., nearly new belt and Dunlop, semi-T.T., running order, ready to ride; £20.—Box 3,066, *c/o The Motor Cycle*. [X1722]

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MOTOR CYCLES FOR SALE.

Radco.

RADCO, T.T. Model, powerful, splendid condition; £33, bargain.—36, King David Lane, Shadwell, E. [2040]

RADCO, splendid running order, good tyres and condition, footboards, horn; £33.—77, Worcester Villas, Hove. [1871]

RADCO, 2½ h.p., 2-stroke, excellent condition, perfect running order, tyres good; 30 gns.—Jarnan, 13, Crouch Hill, N.4. [2163]

1918 Radco, 2½ h.p., little used, ride away, owner having combination; offers.—8, Navy St., Clapham, London, S.W.4. [1867]

RADCO 2½ h.p. 2-stroke, 1916 model, condition like new, original tyres, footboards, splendid hill-climber; £35, or near offer; ride away.—34, Chatterton Rd., Bromley, Kent. [2194]

Rex

3½ h.p. Rex, low, Bosch magneto, B. and B., good tyres; £25.—8, Brandreth Rd., Balham. [2335]

5-h.p. Rex Combination, tyres and belt, new, horn and lamps, running order; £55.—12, Buckland Rd., Leyton, E.10. [2057]

LATE 1914 6-h.p. Rex Coachbuilt Combination, been stored, condition perfect; seen after 6; £75.—4, Clyde Rd., Brighton. [2147]

6 h.p. Rex V., 2-speed, chain drive, Bosch mag., handle start, and C.H. sidecar; £50.—56, Horton Rd., Kilmhurst, near Rotherham. [X1919]

1915 Rex, 4 h.p., Sturmer-Archer 3-speed, Binks carburettor, good condition; £55.—Pratt, Decorator, Tottenham Lane, Hornsey. [2224]

REX Combination, late 1913, 6 h.p. twin, P.E., 2-speed, overhauled, lamps, tools, etc.; ride away; £85.—5, Market Place, Northfield Av., West Ealing. [2113]

3½ h.p. Rex, in good working order, tyres and tubes good as new, Bosch; £28, or nearest offer; going abroad.—Box L1475, *c/o The Motor Cycle*. [1841]

3½ h.p. Rex, single, very powerful and fast, any test, any guarantee, been overhauled, smart appearance; £33; reason selling, leaving the country.—15, Cardigan Rd., Richmond Hill. [1735]

1913 Rex Combination, twin, 2-speed, clutch back wheel, handle start, not run since 1915, splendid condition; £70, or best offer.—Evans, 53, Bridge St., Kington, Herefordshire. [X1864]

1914 6-h.p. Twin Rex C.B. Combination, 2-speed, clutch, foot control, handle starting, Bosch, B. and B. Cowey speedometer, new Dunlops on cycle recently, lamps, horn, tools, pump, and spares; any trial or inspection; £80.—Noneley, Beaumhurst, Uttroxeater, Staffordshire. [X1800]

Rex-Jap.

1915 Rex-Jap, 8 h.p., 3-speed countershaft, all enclosed chain drive coach sidecar; £95.—29, St. Leonard's St., Bromley-by-Bow. [2083]

REX-J.A.P., T.T., overhead valves, 4 h.p. J.A.P. engine, fitted with Grado gear, very fast and powerful; any trial; £48.—C.S., 14, Swaton Rd., Bow, E.3. [2101]

Rover.

£55.—1914 3-speed Rover, lamps, horn, etc.; any trial.—Empson, Gamlingay, Sandy. [2278]

ROVER, earliest deliveries; your name on our book ensures this.—Martin Mitchell, Ltd., Stafford. [X59799a]

ROVER 3½ h.p., 2-speed, kick start, coach sidecar, any trial; £56.—C.S., 14, Swaton Rd., Bow, E.3. [2099]

ROVER 1914 3½ h.p., sporting combination, C.B., 3 speeds, clutch, fully equipped; 55 gns.—93, Northwold Rd., Clapton. [2109]

ROVER.—Several T.T. with or without Philipson pulley (second-hand), in excellent condition.—Turpin, 29, Preston Rd., Brighton. [1758]

ROVER 1914 3½ h.p. Combination, excellent condition, P. and H., mechanical hooter; 58 gns.—101, Aylesbury Rd., Walworth, S.E. [X2094]

1913 3½ h.p. Rover, Bosch, B. and B., clutch, new cover; £35, or exchange variable gear machine, cash adjustment.—Clarke, 24, Adderwell Rd., Frome. [2116]

ROVER (Imperial) 3½ h.p., as new, T.T., 3-speed, clutch, Senspray, Bosch, all accessories, new tyres; £75; after 6.—Apply, 472, Hornsey Rd., Holloway, N. [2069]

3½ h.p. T.T. 1917 Rover, Philipson pulley, lamps, tools, £22, etc., very fast, been stored 15 months, excellent condition; £65, no offers.—H., 117, London Rd., Twickenham. [2275]

ROVER 3½ h.p. 3-speed, free engine, good lamps, horn, some accessories, perfect condition; 50 gns.—Morford, Torret House, Bradbourne Rd., Sevenoaks. [2296]

ROVER Combination, 1914, 3-speed, coachbuilt sidecar, speedometer, lamps, tools, spares, excellent condition; £75.—Philcox, 4, Hewett's Villas, Greenhithe, Kent. [2018]

1918-19 Rover Combination, 3-speed countershaft, kick starter, lamps, Klaxon, all accessories, everything perfect, condition as new; owner bought car; 95 gns.—Durose, Scropton Farm, Poston, Derby. [2161]

MOTOR CYCLES FOR SALE.

Rover.

BARGAIN, £65.—Rover, 3½ h.p., with coachbuilt sidecar, absolutely as new, bought new late 1914, unused during war, 3 speeds, lamps, outfit in splendid condition, ready to drive away.—Clovelly House, Banbury Rd., Oxford. [X1779]

Royal Ruby.

ROYAL Ruby 1916 2-speed 2-stroke, fully equipped, perfect; £39.—6, Rylston Rd., Fulham, S.W.6. [X1991]

Rudge.

RUDGE 3½ h.p., clutch, free engine, good condition; £27.—Kirkwood, Helmsley. [X1531]

RUDGE Multi Combination, not used during war; £75.—Capt. Forster, Brackley. [X1528]

RUDGE 1913 3½ h.p. T.T. Clutch Model; £30; after 7.—Harveyson, Station Rd., Finchley, N. [X1715]

RUDGE, 1915, 3½ h.p., free engine, perfect order; £50.—Thornely, 34, South St., Ashbourne. [X1250]

3½ h.p. T.T. Rudge Combination, fast; £45.—Frost, 11, Chitty St., Tottenham Court Rd., W. [X2045]

RUDGE Multi Combination, 5-6 h.p., end 1913 model, mechanically new; bargain, £80. Kirklands, Tetbury, Glos. [X1883]

RUDGE Multi 1915 3½ h.p.; price £48; owner bought combination.—Harst, 78, Edgell Rd., Staines Middlesex. [X1794]

1913 Rudge Multi, 3½ h.p., very little used, not ridden since 1914, perfect condition; immediate sale.—76, Eaton Terrace, S.W.1. [X1848]

5 h.p. Rudge Multi, 1914, first-class condition, with Rudge coachbuilt sidecar; been stored; £70.—Cooper, 7, Holdsworth St., Windhill, Shipley. [X1887]

1915 3½ h.p. Rudge Multi Combination, clutch, pedal start, good tyres and tubes, lamps; first cheque for £62 secured.—21, Keppel Rd., East Ham. [X1980]

RUDGE C. Combination, 1914, all accessories, spare tyres, tubes, belts, speedometer, lamps; ride away; £80.—8, Grosvenor Gardens, Cricklewood, N.W.2. [X1705]

1914 Rudge, not ridden 400 miles, free engine and clutch, in first-class condition; owner in army since 1914; £48/10.—Heaps, 51, Crosby St., Cale Green, Stockport. [X1892]

RUDGE T.T. Model, tyres and belt not done 100 miles, fixed engine, fast, engine in excellent condition; £37/10.—Lacton, 15, Rutland Terrace, Stamford. [X1925]

RUDGE Multi, T.T. Model, disc wheels, new Dunlops, torpedo steel sidecar, pillion seat; owner going abroad; 60 gns., no offers.—Capt. Clark, 60, St. George's Rd., Aldershot. [X1902]

RUDGE T.T., fixed gear, Binks, Dunlop studded and belt nearly new, improvised footboards, excellent condition, ready for any journey; £40.—Sergt. Ridgway, Royal Engineers, Wendover Hall, Humberston, Cleethorpes. [X1724]

RUDGE Multi 3½ h.p., with Rudge coachbuilt underslung sidecar, fitted new heavy Dunlops throughout, outfit not run 1,000, been stored, complete with storm apron, lamps, spares, etc.; 87 gns.; eotertain part exchange furniture.—36, Lerborne Park, Kew. [X2075]

Ruffles.

RUFFLES.—Delivery from stock, 2½ h.p., 2-speed.—W. H. Grimes and Co., 18a, Bruton Place, New Bond St., W. [X2107]

Scott.

SCOTT, 1915, 3½ h.p., 2-speed, kick-start, fair condition; £43.—Box L1545, c/o The Motor Cycle. [X2322]

3½ h.p. Scott, Bosch mag., 2-speed, kick start, last, £44 perfect, 1914; £60.—323, Romford Rd., Forest Gate. [X1787]

1914 Scott Combination, Mills-Fulford sidecar, excellent engine, fast.—Midgley, 187, Toller Lane, Bradford. [X2263]

SCOTT, nearly new, semi-T.T., Cowey speedometer, k.s., low mileage, perfect; £90.—J. Fox, Ferry Bank, Queenslerry, Chester. [X1863]

3½ h.p. Scott, 2-speed, clutch, kick start, Bosch mag., very fast, stored during war; seen after 6 p.m.; £45.—Oakmeade, Barnet. [X1942]

SCOTT 3½ h.p., Nov., 1914, new tyres, lamps, horn, just overhauled, any trial; 60 gns.—Wilson, 45, Malden Rd., Kentish Town, London. [X2003]

SCOTT Combination, 1915, like new, believed not ridden 50 miles, W.D. model, very fast; any trial; £75.—Wadlow, Chislehurst Rd., Orpington. [X2232]

SCOTT 3½ h.p., Bosch mag., B. and B., Smith speedometer, lamp, horn, newly enamelled, needs overhauling; 32 gns., bargain.—26, Victoria St., Scarborough. [X1701]

1916 Scott Combination, 2 speeds, clutch, kick starter, overhauled, all in splendid condition, and very good tyres; £75.—Martin, 8, Grenville St., W.C. [X2290]

SCOTT Combination, coachbuilt, upholstered, ready to ride away, B. and B., Bosch, clutch, lamps complete next turnout; £55.—Harrison, 33, Lawn Rd., Fishponds, Bristol. [X1407]

SPORTING Scott, 1913-14, 2 speeds, clutch, kick start, disc wheels, T.T. bars, unused during war, very fast; £45; also coachbuilt sidecar for same.—Wood, Greenford House, Greenford, Middlesex. [X1828]

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MOTOR CYCLES FOR SALE.

Scott.

SCOTT, 3½ h.p., 1915, all red, T.T., disc wheels, gear just overhauled, replacement invoices given, many new spares, new Dunlop back; £70, or nearest offer.—Capt. Buck, R.A.F., Eastchurch, Sheppey, Kent. [X2193]

LATE 1914 genuine Scott motor cycle and Scott sidecar, W.D. type, just overhauled, kick-start, 2 speeds, no lamps or accessories, good tyres; quick sale £65, no offers.—Berresford's Garage, Holywell Cross, Chesterfield. [X1481]

Sheffield Minor.

SHEFFIELD Minor, 2½ h.p., 2-stroke, 2-speed, perfect order, wide bars; £38.—Virgo, 156, High St., Hounslow. Tel.: 125. [X1799]

Singer.

SINGER 2½ h.p., variable gear, Bosch, B. and B., wants overhauling; cheap.—Martin, Wangford, Suffolk. [X2229]

1915 Singer, 3½ h.p., 3-speed gear, free engine, very little used, in good condition; £58.—Mitchell, 14, Lebanon Park, Twickenham. 'Phone: Richmond 1444. [X2192]

SINGER Coachbuilt 2-speed Combination, all good tyres, lamps, speedometer, glass, horn, spares, and tools, first-class condition; £85.—62, Beachcroft Rd., Leytonstone, N.E.11. [X2137]

SINGER, latest model, 4½ h.p., Singer coachbuilt sidecar, countershaft gears, all enclosed chain drive, foot clutch, kick start, speedometer, wind screen, electric lighting; £85, or offer; after 6 p.m.—61, Colvestone Crescent, Dalston, E.8. [X2184]

Sun.

EARLY Delivery from the sole Sun Vitesse Sheffield and District agent, Dan Bradbury, 224, London Rd., Sheffield. [X17271]

SUN-VITESSE, 2-stroke, 12 speeds, condition as new, lamps, horn, etc.; £42, genuine.—34, Cassland Rd., South Hackney, N.E. [X2150]

SUN 2-stroke, Oct., 1918, V.T.S., 2-speed countershaft, good condition, all accessories; £38.—Lt. Gaudet, M.T.R.D., R.A.F., Harlescott, Shrewsbury. [X1894]

Sunbeam

SUNBEAM, 1918 Army model, 3½ h.p., Chater-Lea wicker sidecar, 3-speed countershaft, complete £110, or solo £105.—5, Chatterton Rd., Bromley, Kent. [X2236]

SUNBEAM 1917 (November) 8hp. Combination, spare wheel, hood and screen, Lucas lamps and horn, done about 2,000; price £165.—28, St. James's St., Brighton. [X1994]

SUNBEAM Combination, perfectly new sidecar, and 1915 3½ h.p. cycle, in grand running order, lamps, etc.; £120; trials invited.—Vivian, 12, Tennis Court Rd., Cambridge. [X1948]

8 h.p. Sunbeam Combination, almost new condition, speedometer, clock, horn, lamps unused, leg shields, Gloria spring wheel sidecar, hood, screen, luggage carrier, mileage about 5,000, a very smart outfit; £135.—Horden, 90, Castle St., Reading. [X2075]

Triumph

TRIUMPH 2-stroke, F.E., 2-speed, condition as new; £55.—94, High St., Tooting. [X2117]

3½ h.p. Triumph, 2-speed, Bosch, good order; £20.—17, Cannon Place, Hampstead. [X1982]

TRIUMPH 3½ h.p., clutch model, sidecar; £40.—Bird, 10, Shipton St., London Rd., S.E.1. [X1724]

1912 3½ h.p. Triumph, clutch, Grado gear; £45.—J. S. Nicholas, Yerbeston, Begelly, Perm. [X1400]

TRIUMPH, 1914-15, 3-speed, clutch, good condition; £45.—Box L1544, c/o The Motor Cycle. [X2321]

TRIUMPH, fixed gear, good order throughout; £30.—Brown Hill House, Stradbroke, Suffolk. [X1404]

BROOK Bros., Barnham, Som., can give early deliveries of Triumph cycle. Write for particulars. [X1699]

TRIUMPH, 3½ h.p., clutch, new tyres; £45.—Halifax Motor Exchange, Union St. South, Halifax. [X1984]

TRIUMPH, 3½ h.p., lamp, new tyres, tools; £45; after 5 o'clock.—14, Woolstone Rd., Catford. [X1909]

COUNTERSHAFT Triumph, in splendid condition, fully equipped; £80.—Empson, Gamlingay, Sandy. [X2279]

TRIUMPHS, two clutch models, one single speed; £36 to £45.—211, Garratt Lane, Wandsworth. [X2267]

TRIUMPH, 3½ h.p., stored during war, grand condition; £29; evenings.—25, Cromwell Rd., Forest Gate. [X1910]

TRIUMPH 1912, clutch model, in excellent condition, lamps, tools, etc.; £45.—104, Plough Rd., Battersea. [X2122]

TRIUMPH 3½ h.p., T.T. model, new lamps, very fast; £35.—29, St. Leonard's St., Bromley-by-Bow. [X2082]

TRIUMPH.—Triumph spare parts supplied by Coventry Motor Mart, Ltd., London Rd., Coventry. [X20613]

TRIUMPH 3½ h.p., Mahon, good running order; 30 gns.; seen after 6.—Wade, Bradfield, Manningtree, Essex. [X2264]

MOTOR CYCLES FOR SALE.

Triumph.

TRIUMPH 4hp. Combination, 3-speed, clutch, 1914 model; 60 gns.—Pearce, 5, Eastville, Weston, Portland. [X1919]

TRIUMPH, clutch model, little used, condition perfect, fully equipped; £50.—33, Courtenay Gardens, Upminster. [X1847]

TRIUMPH, 3½hp., 2-speed, countershaft, kick start, Bosch mag., in good condition; £33.—3, Salisbury Terrace, Yeovil. [X1845]

TRIUMPH, 1914, 3½hp., clutch model, good condition; £40, or nearest; after 5.—77, Wood Lane, Shepherd's Bush, W.12. [X1720]

1914 Triumph, 4hp., 3-speed, clutch, coachbuilt sidecar, perfect condition; £75.—Cayle, New Rd., Chilworth, near Guildford. [X1856]

TRIUMPH 3½hp., 3 speeds, clutch, coachbuilt sidecar, little used, perfect condition; £70.—S. Warboys, Belmishorpe, Stamford. [X1780]

1919 4hp. Triumph and cane sidecar, lamps, generator, speedometer; what offers over 120 gns.—108, Saltergate, Chesterfield. [X1896]

TRIUMPH 1913 3½hp., Bosch, B.R., good tyres, does a hundred m.p.g., fast and reliable; £33.—Collins, 21, Pulford St., S.W.1. [X2111]

TRIUMPH, clutch, free engine, no magneto, carburettor or belt; wants overhauling; engine perfect; 8 gns.—Saxby, Saddler, Margate. [X1492]

4hp. 1914 Triumph, 2-speed countershaft, K.S., new tyres; seen any time; £48.—Benjamin, Moorland, Lampton Rd., Heston, Hounslow. [X1702]

TRIUMPH 3½hp., clutch, overhauled, new T.T. bars, belt and parts, perfect running order; £48, no offers.—29, Ellesmere Rd., Cbiswick. [X2118]

1913 Triumph, 3 speeds, Bosch, lamps, horn, etc., good condition, and mechanically perfect; £55, no offers.—129, South Lambeth Rd., S.W. [X2119]

TRIUMPH, 3½hp., clutch model, tyres as new, complete with lamps, excellent order, stored during war; £42.—H. Judd, Fringford, near Bicester. [X1709]

TRIUMPH 1919 Model H. 4hp., 3-speed countershaft, never ridden; seen London; offers over £87/10 to Box L1460, c/o The Motor Cycle. [X1775]

TRIUMPH 1912 Clutch Model, N.S.U. gear, new cylinder valves and tyres, cane built sidecar; £47/10, or nearest.—Lawrence, Bourton-on-the-Water. [X1489]

TRIUMPH 1913, free engine clutch model, good condition, new back tyre, front good, ready to ride away; £38.—127, South St., Bishops Cleeve, Herts. [X2212]

TRIUMPH Combination, 1910, N.S.U. 2-speed gear, recently overhauled, perfect condition; any trial or examination.—Parker's, Bradshawgate, Bolton. [X1941]

TRIUMPH Combination, 3½hp., 2 speeds, free engine, stored during war, little used before; £45; genuine.—34, Cassland Rd., South Hackney, London, N.E. [X2149]

LATE 1914 4hp. Triumph Combination, 3-speed, with all accessories, perfect throughout; bargain, £65.—c/o A. E. Ellis, Boot Stores, Saxmundham, Suffolk. [X1956]

TRIUMPH, stored 4 years, 3½hp., mag., fine machine, only 38 gns.—Wandsworth Motor Exchange, Ebner St., Wandsworth. Phone: Battersea 327. [X2032]

TRIUMPH, 3½hp., B. and B. carburettor, new Dunlop, tank re-enamelled, lamp, etc., good running order; £34.—73, St. Leonard's Rd., East Sheen, S.W. [X2249]

3½hp. Clutch Triumph, overhauled, re-enamelled, replated, front tyre good, back new, new belt, renal accessories; £50.—Box L1541, c/o The Motor Cycle. [X2318]

TRIUMPH, 3½hp., 1912, fixed engine, Bosch mag., fast, new belt, back tyre good, front little worn, been stored; 38 gns.—G. Hollinghead, Pamber, Basingstoke, Hants. [X1845]

1916 Countershaft 4hp. Triumph, excellent condition; £80.—Langman Bros., 2, King Parade, Acton, or 17, Bond St., Ealing. Phone: 1578 Cbiswick. [X2036]

TRIUMPH 4hp., 1914 T.T., 3-speed, clutch, new tyres, overhauled last month; £65; reason for selling, buying car.—Keene, Homeland, The Beach, Shoreham-on-Sea. [X1946]

TRIUMPH 1915 4hp., 3 speeds, clutch, not done 1,000, perfect condition, horn, lamp, etc., very fast, stored 3 years; 80 gns.—Codrington, 110, Eaton Sq., S.W.1. [X1760]

TRIUMPH 1913 Clutch Model, under 3,000 miles, bought new 1914, not ridden during war, complete spares; £38; seen after 6.30.—30, Archibald Rd., Tatnell Park, N.7. [X1779]

TRIUMPH, 3½hp., 2-speed, F.E., good running order, new belt and tyres, wicker sidecar, upholstery slightly damaged; £30, or sell separately, £25 and 24.—Saker, 42, Hanover Park, Peckham, S.E. [X1854]

TRIUMPH 1914 Combination, 3-speed, clutch, kick start, lamps, horn, coachbuilt sidecar, wind screen, extra seat; best over £55; ride away. Wanted, Enfield twin.—514, Old Ford Rd., Bow, London. [X2106]

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Triumph.

1911 Triumph, clutch model, fitted N.S.U. gear, wicker boat sidecar (as new), good tyres all round, new belt, lamps, horn, spares, tools, ready for journey; £47, lowest.—A. Gillett, 37a, Marefair, Northampton. [X1762]

TRIUMPH 1914 T.T., complete with lamps, etc., less power unit, splendid condition, 30 gns.; underslung coachbuilt sidecar, wind screen, £15/10; 1911 frame and tank complete, £3.—Morgan, 17, Atherfold Rd., S.W.9. [X2334]

TRIUMPH T.T., 1912, overhauled, new piston and connecting rod complete, Binks carburettor, celluloid covered bars, sound fast solo mount, guaranteed, idle during war, all accessories; £35.—Write, Lieutenant Lewis, 39, Hartfield Rd., London, S.W.19. [X1904]

TRIUMPH 4hp. T.T., 1914 (December), stored 3½ years, recently overhauled by makers, perfect condition, extra Philipson pulley, Watford speedometer, large tank, usual accessories, new tyres and belt; 52 gns.—12, Cheltenham Terrace, Chelsea, London. [X1764]

TRIUMPH 1914-15 Combination, Sturmer-Archer 3-speed, tyres in topping condition, set lamps, 2 generators, back rest on seat, special Canoelet sidecar; 90 gns.; seen Thursday after 5 p.m., or Sunday morning.—W. I. Anstin, 272, Durnsford Rd., Wembleton Park, S.W.19. [X2008]

TRIUMPH 3½hp. Combination, Sturmer-Archer 3-speed hub, Bosch mag., Kempshall tyres in good condition, Mills-Fulford C.B. sidecar, Cowey speedometer, complete set 3 lamps, horn, pump, tools, spares, plate and enamel almost as new, sound mechanical condition; £80.—5, King Edward Rd., Rugby. [X1767]

Velocette.

LIVERPOOL and District Agents for Velocette. Place orders now to secure early delivery.—Victor Horne, Ltd., 9, Parr St., Liverpool. [X0005]

Verney.

VERNEY Motor Cycle for sale, B. and B. carburettor, Dixie mag., just been overhauled, needs timing; £10; new saddle; a bargain.—Box L1532, c/o The Motor Cycle. [X2309]

Victoria.

LATE 1915 2½hp. Victoria, 2-speed countershaft gear, Villiers 2-stroke engine, very little used, original heavy Dunlops still on; £28.—Cairns, Castlefin, Co. Donegal. [X1915]

Vindec.

6hp. Vindec Special, spring forks, Bosch mag.; bargain, £45.—8, Wordsworth Rd., Wallington. [X2009]

Wanderer.

WANDERER, twin 3hp., variable gear, spring frame, like new, any trial; £36.—C.S., 14, Swaton Rd., Bow, E.3. [X2098]

Williamson

WILLIAMSON w.c. Combination, really first-class, complete; £120.—Longney, Oswestry. [X1940]

WILLIAMSON, 1914, 8-10hp., coachbuilt sidecar; 95 gns.—245, Hammersmith Rd., W.6. [X2216]

WILLIAMSON'S 8hp., water-cooled, hood and screen.—Hayman, Chipping Norton, Oxon. [X1993]

WILLIAMSON Combination, 1915, 8hp. water-cooled, in new condition, used for a short time prior to owner joining up, coachbuilt sidecar with hood and screen, luggage carrier at rear, lamps, electric horn, speedometer, etc.; price £115.—E. F. Piggie, Ltd., Edgware. [X1744]

WILLIAMSON 8-10hp. Water-cooled 1914 Coachbuilt Combination, lamps, speedometer, renewed and overhauled by first-class engineer, as new in appearance, mechanically sound, and ready in every detail for hard business or pleasure use; £120.—47, Hamilton Rd., Reading. [X2074]

Wolf.

WOLF 2-stroke, done 400 miles; £32.—Longnev, Oswestry. [X1933]

2½hp. Wolf, 2-stroke, 1915, in new condition; £32.—34, Cassland Rd., South Hackney, London, N.E. [X2148]

WOLF, 2½hp., 2-stroke, 1916, splendid running order.—Johnson, Station Rd., Eynsford, Kent. [X1825]

WOLF, Barman, 1914, 2½hp., geared, running order; £30.—Cooper, Hillside, 71, Bath Rd., Worcester. [X1770]

WOLF, late 1916, 2½hp., 2-speed, hand clutch, stored for 2 years, fully equipped, new condition; 55 gns.—Brent, Knoll, Herbert Rd., Hornchurch. [X1846]

WOLF J.A.P., 1914, 4hp., 2-speed and clutch, all chain drive, tyres like new, lamp and horn, guaranteed condition; £45.—G. Bachs, 6, Wilton Mews, South Belgravia, S.W.1. [X1862]

Wooler

WOOLER 2-stroke, variable gear, American clutch, B. and B. Jones speedometer, P. and H. lamps, shock absorber, belt tightener, new; nearest, £45.—Heddon, University Hall, Ealing, W. [X1926]

Zenith.

1915 Zenith-Gradna, 6hp. (Bowser) Combination, splendid condition.—Gillingham, Springfield, Chard. [X1813]

MOTOR CYCLES FOR SALE.

Triumph.

ZENITH 6h.p. Twin, coachbuilt sidecar, Gradua gear, clutch; £75.—211, Garratt Lane, Wandsworth. [2268]

ZENITH Combination, Gradua gear, 3½h.p. single, absolutely O.K.; £50. Owen, 1, Hollyhedge Terrace, Lewisham. [2133]

ZENITH, late 1914, 6h.p., countershaft, kick starter, Millord Empress sidecar; £70.—Coronation Cottage, Longfield Rd., Tring. [1998]

ZENITH-GRADUA 4h.p., new Michelin, new belt, lamps, and horn, perfect mechanical order; £45.—7, Orchard St., Newport, Wight. [X1799]

SPORTING T.T. Zenith, 8-10h.p., 1917, light sidecar, electric lighting, little used; £87; appointment.—Littleboy, Leighton Park, Reading. [X1538]

ZENITH 6h.p., countershaft, kick start; £95; change lower power; cash adjustment.—Mosedale, 30, Canterbury Rd., West Kilburn, N.W.6. [2001]

ZENITH-GRADUA J.A.P., Bosch mag., very powerful, will take sidecar, perfect condition, ride away; £52 first cash. Saturdays.—47, Colvin Rd., East Ham, E.6. [X1999]

ZENITH 6h.p. and sidecar, excellent running condition, speedometer, Bleriot prismatic lamp, all accessories and A.A. insurance; £75.—Vokes, 40, Twickenham Rd., Teddington. [1974]

ZENITH-GRADUA, 4h.p., 1913, and Canoelet cane sidecar, thoroughly overhauled after 3 years' disuse; about £50, or sell separately.—Garner, Grey Friars, Ryhall Rd., Stamford. [X1710]

ZENITH-GRADUA 8h.p., hand controlled clutch, lamps, etc., excellent running order and condition, little used; £75; seen after 6 p.m.—436, Whitehorse Rd., Thornton Heath, S.E. [2131]

ZENITH-GRADUA 8h.p. J.A.P. Combination, speedometer, lamps, ready for road, good condition; nearest £85, bargain; severe trial; no dealers.—Apply, 3, Mayow Rd., Forest Hill, E. [2244]

ZENITH-GRADUA 4h.p., 1914 or 1915, enamelled red, discs, all lamps, mechanical horn, water idea for engine, good condition, very fast, tools, perfect, speed merchant; £60.—Mounsey, Newland, Ulverston, Lancs. [X1320]

RED Zenith, 6h.p., 1915, just overhauled, excellent condition, fast and sporting; 85 gns.; no dealers.—Lt. Dolman, The Cottage, Ramhill Rd., West Hampstead, N.W.2 (opposite Platt's Lane, Finchley Rd.). [X389]

1914 Zenith-Gradua Combination, 6h.p. J.A.P. twin, Bramble sidecar, lamps, horn, hood, screen, tubes, tyres practically new, perfect condition; £110 cash, no offers; owner buying car; after 7 p.m.—136, Hoppers Rd., Winchmore Hill. [X1801]

ZENITH New 4-5h.p. Twin, just delivered, complete with lamps, mechanical horn, speedometer, unused, cost £90, receipt shown, good reason for selling; best offer will be accepted; after 6 p.m.—"Rosemary," Tram Terminus, Ditton, Surrey. [1880]

Ladies' Motor Cycles.

CALTHORPE 2½h.p. Lady's De Luxe, Enfield 2-speed, soiled only; offers.—Briar Mill, Droitwich. [X1768]

LADY'S Levis 2½h.p., 2-speed, new condition, speedometer; £45.—32, Leigham St., Plymouth. [1977]

LADY'S Douglas, in good condition, as new, 2-speed, clutch, and kick starter; £55.—38, Upton Rd., Dalston. [2174]

LADY'S Motosacche, nice low machine. Bosch, B. and B., pedal start, easily handled, now being ridden by lady, very good condition; £22, or offer.—Grove Hotel, Balderton, Newark. [X1587]

VELOCETTE 2½h.p. 2-stroke, lady's model, 2-speed, all chain drive, Senspray carburettor, E.I.C. mag., done 250 miles only, and is absolutely as new; £45.—Watson, 132, High St., Aldeburgh, Suffolk. [2130]

Miscellaneous

1913 Douglas, 2-speed, clutch; £38.

1911 Triumph, clutch model; £37/10.

1914 B.S.A., 4½h.p., clutch model; £49.

1915 Indian, 7-9h.p., 2-speed, spring frame; £85.

1914 N.S.U., 5h.p., twin, 2-speed; £42.

GUMMERSON, John's Place, Acton, W. (next post office). [1934]

1918 Alders 2-stroke, 1912 Douglas 2-speed.—54, Pritchard Rd., Hackney Rd., E. [2276]

1919 Hobart and British Excelsior 2-speed 2-strokes in stock.—Clifford, Motorcycles, Eastwood, Nottingham. [2235]

MOTOR Cycles; any make new machine supplied on best terms; quick delivery secured; second-hand bargains in motor cycles and combinations.—The Mart, 161, Caledonian Rd., King's Cross, London. [1590]

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Miscellaneous.

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IVY 1919 2½h.p., 2-speed, new machine; list price.

NEW Hudson 1913 3½h.p., 3-speed, clutch, guaranteed; 37 gns. (160.)

SCOTT Combination, 1913, 3½h.p., coach sidecar, 2-speed, kick start, in perfect order; 55 gns. (178.)

NEW Imperial 1916 2½h.p., 2-speed, T.T. model, just overhauled; 35 gns. (177.)

DENE-PRECISION, 1914, 4h.p., 3-speed, clutch, as new throughout; 55 gns. (179.)

DOUGLAS 1915 2½h.p., 3-speed, T.T., unscratched; 62 gns. (181.)

TRIUMPH 1912 3½h.p., clutch model, T.T. bars, overhauled; 29 gns. (174.)

PULLMAN Pilot, 1914, 3½h.p., 3-speed, clutch, just overhauled, J.A.P. engine; 50 gns. (154.)

DOUGLAS 1914 2½h.p., T.T. model 2-speed, very fast; 45 gns. (180.)

ENFIELD 1915 3h.p. T.T. Model, 2-speed, Enfield gear, just completely overhauled; 47 gns. (176.)

N.S.U. Combination, 1914, 3½h.p. twin engine, 2-speed, kick start and clutch, complete with sidecar; 49 gns. (175.)

TRIUMPH 1915 2½h.p., 2-speed, 2-stroke, like new; 59 gns. (169.)

WOLF 1915 2½h.p., 2-speed, 2-stroke, in fine order, and very fast; 36 gns. (148.)

THE H.C. Motor Co., 347, Finchley Rd., N.W.3. Phone: Hampstead 4631. Open Saturday afternoons and Sundays. [949C]

FOR Sale, 3½h.p. racing J.A.P. in perfect running order; £45.—Apply, R. Brown 30, Boundstone St., Trowbridge, Wiltshire. [2245]

4h.p. Motor Cycle, mag., spring forks, B. and B. perfect, ride away; £25.—4, Scotts Villas, Thornton Hill Rd., Thames Ditton. After 6. [2246]

TWO Motor Cycles, snit mechanic, one fitted H.T. mag., less cylinder, good tyres; £15 the two.—Bedford, Sonnyhill Rd., Streatham, S.W.16. [2172]

1913 5-6h.p., 4-cyl., shaft drive, two speeds, P.B. clutch, spring forks, T.T. bars, just been thoroughly overhauled; first £36 scores.—Millard's, Chesterfield. [X1482]

MOTOR Cycle, 3h.p., F.E. hand-operated clutch, Ariel engine, kick start, in perfect condition, ready to ride away; price 38 gns.—Apply to Morgan, 7, Lancashire St., Queen's Park, Harrow Rd. [1833]

WILLIAMSON 8h.p., Douglas engine, 2-speed, clutch, magnificent underslung coachbuilt sidecar, like new, with wind screen, cover, speedometer, mirror, horn, etc., perfect, £100.—22, Drayson Mews, back of Kensington Town Hall.

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4h.p. Douglas, 1915, kick start, clutch, 2-speed, speedometer, mechanical horn, knee grips, condition fine, 70 gns.; also 4h.p. water-cooled Precision, 1915, 2-speed, fully equipped, £45; will sell both £114, or exchange small car.—Ellis, 59, Hugh Rd., Coventry. [X1870]

CLEARING Out Sale.—3½h.p. Minerva, complete with sidecar chassis, good order, £14/10; Blackburne, 6h.p., overhead valves, wants magneto and exhaust pipes, £14/5; DH2 Bosch magneto, clock-wise, nearly new, for twin, £4/10; lot £32; all carriage paid.—Clifton, 62, Wells Rd., Bristol. [X1995]

TRICARS FOR SALE.

A.C. Sociable, seats 3, good going order, all sound; £30.—Bellairs, Branspore, Christchurch. [X1993]

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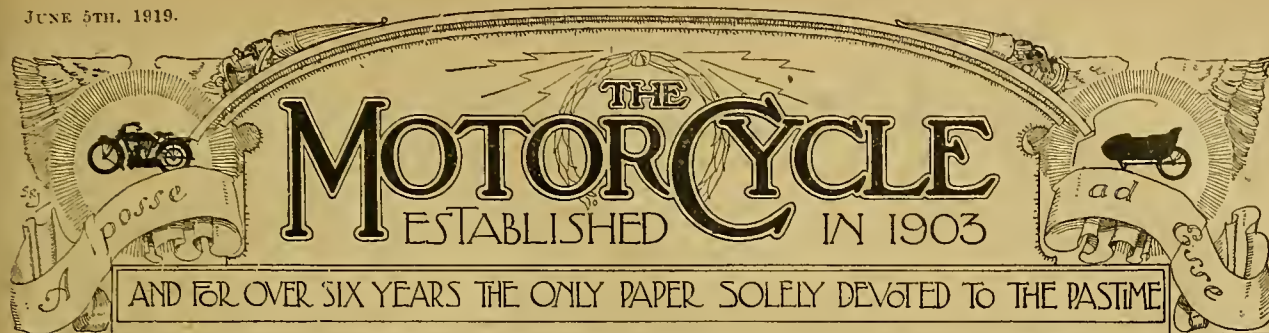
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Co-operation.

WHEN one spends £60 to £150 on a motor cycle it is probably the event of a lifetime, at least for many. Therefore it is not surprising that such purchasers should have definite views of their own requirements, such desiderata constituting what is generally termed "demand."

Now the people who should be in the best position to gauge this demand are the salesmen, because they know what the public asks for and are constantly in contact with experienced motor cyclists who are never loth to discuss the features of their previous mounts. It is, therefore, obvious that for this knowledge to be fully utilised there must be close co-operation between the designing department of the motor cycle manufacturing concerns and the men who sell their machines. This has frequently been done to a certain extent, and demands even anticipated, but there is also often a dormant demand the existence of which is not realised.

The public, and the motor cycling public particularly, likes to be educated, but in its own time and way. It is not particularly anxious to have anything forced on it, and this cannot be done except by tremendous effort. There has been too much tendency to introduce new essentials in construction instead of refining those already in existence. In spite of reconstruction, this is not an age of radicalism; it is rather a period of intelligent refining of essentials. We have the essentials that make up a successful motor cycle in various price limits. The problem is to make the things we already have better, more saleable; to recognise more what the public wants in the form of convenience, appearance, and cleanliness.

The designer is undoubtedly in a difficult and delicate position. He has to steer a medium course between the demands of production and the public desires. The public wants many things that the production department finds it impracticable to build. The sales department

does not want certain features on a machine for the sake of causing trouble in the production department. It wants particular features that, as shown by the experience gained in meeting the users and dealers who buy machines, are demanded.

Motor cycles are divided into classes according to the order of the five essentials of the successful machine: reliability, appearance, performance, economy, and price. Reliability should come first in all cases, and "appearance" covers mudguarding, etc. The other qualities take precedence according to circumstances.

The manufacturing end of the industry is constantly looking out for new developments in the engineering side; this is good, but we would like to see more attention devoted to the many things that can be refined.

Taxation of Miniatures.

IT seems absurd that, while the pedal cycle is free from taxation, a miniature machine fitted with a diminutive engine at once becomes subject to a tax of £1, and also entails registration and a driving licence.

We have frequently referred to the desirability of a reduced tax for such machines as motorised bicycles, and the need for some reform again becomes apparent now that several firms are seriously entering the industry with such auxiliary motors and "scooters."

If the pedal cycle is exempt because it is a machine used by the multitude for utilitarian purposes, then the case for motor cycles designed with a similar object should also be considered by the authorities.

It is suggested that a 50% reduction in tax should be made where a motor scooter does not exceed 2 h.p. and a weight of 80 lb.—a suggestion we commend to the notice of the A.C.U. and the A.A. for consideration in connection with their plans to combat any unfair taxation which may be suggested when the Chancellor of the Exchequer revises the present schedules.

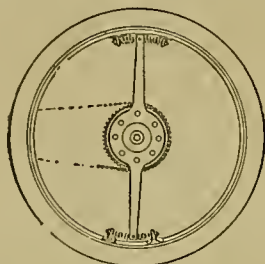
IDEAS: Useful and Ingenious.

Gray R Jones.



An Amateur's Cush Drive.

A HOME-MADE shock absorber on a chain-driven machine was made as follows: Four small brackets were bolted to the rear wheel rim as shown—two on each side, each pair being connected by a rod which carries two stiff coil springs. The chain wheel, instead of being attached to the spokes, is carried



An easily-made shock absorber.

on a disc which has two arms projecting almost to the rim. At their extremities a loop is formed, which passes round the rod between the springs. It will be seen that the drive must of necessity be taken, via the arms, through the springs, with consequent saving in tyre wear.

A Saddle Improvement.

ACCORDING to Mr. F. G. Ratcliff, of Birmingham, the ordinary saddle can be made very much more comfortable, especially for long-distance riding, by making a felt pad as follows: Procure a piece of felt half an inch



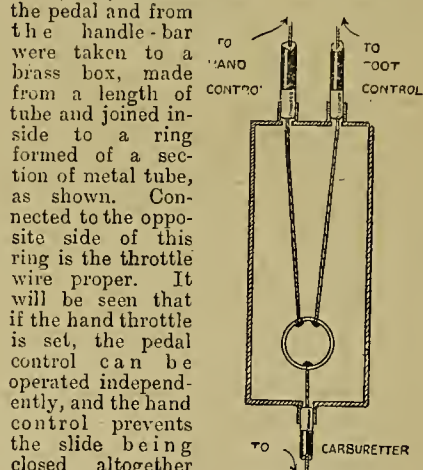
Adding comfort to the saddle by the addition of a felt pad.

thick, and cut to the shape of the saddle, and sew thinner pieces in a semi-circle round the back to make it thicker there. Then cover the whole with American leather, which will make it waterproof. It is secured to the saddle by wires—tapes are not strong enough—one over the peak and two at the rear. The additional thickness at the back provides a better shaped seat than the standard saddle.

Readers of "The Motor Cycle" are invited to contribute to this page any ideas successfully adapted to their motor cycles. Contributions will be paid for at our usual rates. Rough explanatory sketches will suffice

Dual Throttle Control.

THOSE who favour pedal control of the throttle will be interested in the device fitted by Mr. E. H. Craig, of Newcastle, to his machine. The wires from



Foot control in addition to handle-bar control for the throttle.

Cleaning Off Enamel.

MANY ex-members of H.M. Forces will be acquainted with the disinfectant known as Creosole. Creosole, if used in its neat state, has the effect of cleaning all enamel from an article. The instructions are very simple. Apply the liquid with a piece of waste to the enamel which it is desired to be removed.

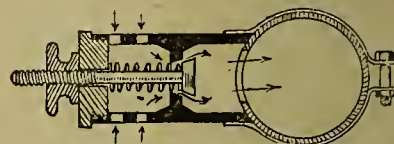
Apply thickly, and allow the fluid to soak in for about half an hour. After the expiration of this time the enamel will have crinkled up. This can now be removed with the aid of a piece of waste. The crinkled portions will wipe off quite easily, but in the case of any small patches remaining, these can be removed by a slight rubbing with waste soaked

in Creosole. The surface will be free from scratches to spoil the effect of re-enamelling.

One must be careful to clean the Creosole from the hands as soon as possible. The English equivalent to Creosole is Jeyes' fluid, but any Creosole-base disinfectant will do.—W. A. EGGINGTON.

Extra Air Valve.

MR. L. R. CUTLER, of Birmingham, has made a useful extra air valve, particulars of which are here given. The valve was made for use while running on benzole, and has proved very useful, especially so because a fine adjustment is provided. The body is turned and bored out of a piece of brass, and the



A simple extra air valve.

valve made from a small bolt with the head tapered slightly to make a good joint with the seat. A light spring is slipped over the stem to open the valve when the nut, which is off a plug terminal, is unscrewed. An ordinary spring clip is attached to the valve body by small screws and soldered, which holds it firmly to the induction pipe.

Induction Pipe Warmer.

TO facilitate easy starting up in cold weather, Mr. G. R. C. Spencer, a Kent reader, utilises the device illustrated. A holder is made from a small tin, to the bottom of which an acetylene burner is attached. Air holes are drilled in the bottom round the burner and also in the sides, and a wire clip is made to suspend the whole from the induction pipe. When required for use, the tube from the generator is connected up and the gas lit, which soon raises the pipe to the required temperature.



A unique method of warming the induction pipe for starting purposes.



American "Service."

MY comments of May 15th have provoked quite a barrage of private correspondence, some of it reasoned and some of it acrimonious. The enthusiasts for the big Yankee twins either state or betray three main reasons for their partisanship. On the first point they are all agreed, viz., that for courteous, efficient, and businesslike "service," the importers usually have the home manufacturers beat to a frazzle. The second ground for adherence to the foreign makes is technical—one engineer sends me a closely reasoned claim that the Americans are superior in design and workmanship to our best products. The third factor is non-arguable, irrational, and feminine, but intensely valid—it is simply "I don't know why I luv you, but I do, do, do."

Maker and User.

SO far as "service" is concerned, I am and must remain a thorough-going ignoramus, for, if a firm supplies my wants promptly and generously, answers my letters by return of post, and treats me decently if a legitimate grievance arises, I cannot safely assume that an unknown private owner at home or overseas would inevitably receive similar consideration; he might, or he might not. But I can assure our home makers that there is a remarkable unanimity amongst correspondents to the effect that you should buy an American if you want to be petted and nursed; and eke that there is a deep and sturdy body of resentment at the manner in which some British firms treat their customers. I will quote one or two recent cases in point, without being guilty of the fallacious suggestion that they are typical. Some months ago I personally ordered a leading British machine. The other day I wrote and asked if the firm could state an approximate delivery date. For ten days I heard nothing; then a curt letter arrived, obviously dictated after a most cursory and unintelligent glance at my query, stating that if I wanted an X—, I had better apply to the local agents (whose name and address were not mentioned). Or, again, the other day a demobilised pal of mine bought a 1913 Indian and sidecar, much against his will, impelled by the fact that it was the only tolerable machine available at his price. He bought it with qualms, and assumed rather an apologetic attitude when mentioning his choice. I am not going to say he had no trouble with it—what can you expect with a 7th-hand six year old? But "service" has converted him into a pro-Yankee of the purest water. When he called at the London depot—which must have been carried on at a heavy loss for several years—he was greeted by an exceptionally intelligent girl, who promptly handed out the required spares across the counter, and that at a rational price. Or, again, a demobilised doctor tells me that he wrote to several British firms on donning civvies, and got replies of the "don't bother me" order: in several cases he made further enquiries, and got no answer at all.

The deduction is obvious. That a number of British firms give "service" of a super-American type is not sufficient. If *all* the importers give A₁ service, and only 10% of the home makers give C₃ service, an impression will be created that for courtesy and good business methods you must buy foreign stuff. The surly, haphazard, exploiting type of maker is not merely a bankrupt in embryo or an irritation to the unfortunate riders who tumble into his maw. He is an incubus to the entire British trade, and ought to be blacklisted by the firms who supply raw materials and accessories, by the shows, and by the trials.

An Engineer on the Americans.

IT is only fair to state both sides, and a technical correspondent takes the following line: "I think Americans in general make better engineering jobs from start to finish. The balance is better, the cam gear is more silent, and the slow running is superior, since the inlet pipe does not require lagging with insulating tape. The weight of the reciprocating parts and the bearing surfaces compare favourably with home practice. The finish of the engines is above reproach, and all spares are a dead fit. The engines wear well, whatever they used to do. Referring to my —, can you name a better hub adjustment, a spring fork with more lateral rigidity or better provision for taking up wear, a better clutch, steering head, etc., etc.? The detail work is simply excellent. Felt-lined chain case—no rattles, and removable in three minutes. A fall does not weld foot-rest spindles to frame. The carburettor gives 85 m.p.g., is adjustable from the saddle, is proof against airleaks, and has a jet which cannot be fouled. Finally, the machine will do from 11 to 70 m.p.h. on top gear." If these claims are facts, they are, of course, unanswerable.

I deduce that the Americans have been steadily growing better and better at a high rate, and that their 1919 models constitute a very serious proposition for our own trade to tackle. Wherefore I repeat my warning of May 15th: Let the British trade establish a reputation for class in big twins and good service before the tariff comes off.

The Weight of Solo Mounts.

ANOTHER correspondent takes exception to my suggestion that three hundredweight is an excessive weight for a solo machine. Of course, I freely admit that 8 h.p. Britishers run quite as heavy as any American 7-9 h.p. My point was that three hundredweight was a ridiculous figure for solo machines, irrespective of nationality. So long as unsprung frames were the rule, machines which exceeded two, or possibly three, hundredweight were emphatically the goods for long distance work. Lighter machines joggled you up badly and roughly, in proportion to their lightness. 200 miles on a lightweight spelt torture; a similar distance on the best

Occasional Comments.—

2½ h.p. machine was tedious; on a two hundredweight machine, with a 3½ h.p. engine, 200 miles did not represent an effort; and the double century on a three hundredweight striding twin was positively enjoyable from start to finish. But the spring frame has changed all that. Even now there are comparatively few spring frames on the road; some of them chiefly serve to elucidate the faults of front forks, which were once unsuspected; others are bad at both ends; and only a few are genuinely satisfactory under hard wear. But the spring frame has washed out the old necessity for a very heavy mount as an essential of comfortable riding, and modern engines can provide the necessary "pep" without undue bulk. I am open to conviction as events develop; but I am quite distinctly and unashamedly of the opinion that a weight of three hundredweight and an engine of 1,000 c.c. will strike the solo rider of the near future as laughable.

If You Don't Have to Push It.

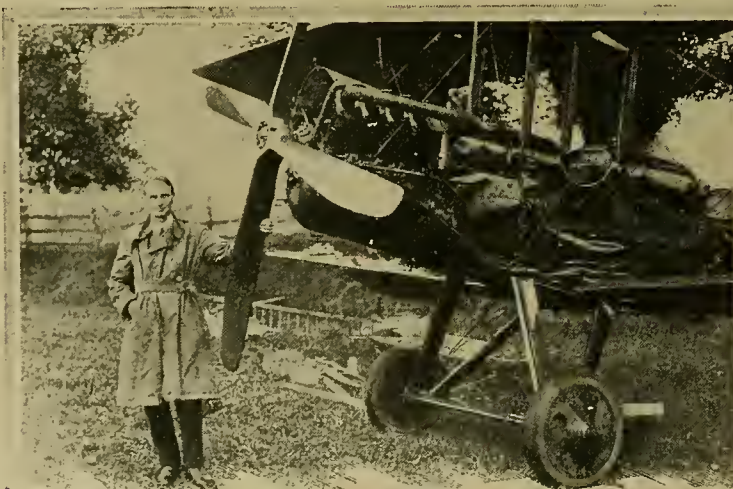
Of course, I am eating my own words—not for the first time. In the early days of the motor cycle, there was a "light v. heavy" controversy. The light brigade wrung their hands, pointed out that the first imported Werners and Minervas weighed one hundredweight or whatever it was, and that misguided Britishers were inflating motor cycles into unwieldy monstrosities with incredible horse-powers (2½ h.p. was the limit in those days). I used to opine that the weight did not matter so long as it propelled itself, and that the real point was to get a reliable runner and a good climber. The claim was true, and we pushed weight up to over two hundredweight and horse-power up to 3½ h.p. nominal. Then the Americans chipped in, and extended the process to the three hundredweight 12 b.h.p. line. Now, I fancy, we shall see the process reversed. The medium-weight will develop until it can do all we want, and finally the pukka lightweight, which no man living has ever seen, will annex half the solo market. After all, weight does matter—it always mattered. It had to yield to reliability, to climbing, to comfort, and to speed. Given those things, no sane man is going to carry an ounce more than is necessary. The heavy machine costs more to buy and to run, and it is always unwieldy to handle, whether "handling" means getting it out of the garage or pushing it to the nearest railway station. One of the main interests of the next two years consists in the fact that we shall be offered machines scaling well under 2 cwt., which will do all that seventy-five per cent. of our riders ask.

The Pioneer in Weight Reduction.

Of course, the Douglas people were the real pioneers in this line. When their first 350 c.c. engines appeared, they represented a definite challenge. Avoiding the pitfall of the featherweight ideal, which was then—as now—impracticable, they said in effect, "Why do you fellows lug so much unnecessary weight about with you? We are cheaper and lighter than your present mounts, but they cannot slip us uphill or on the flat, and they cannot give us any start in reliability or comfort." It just was not quite true, but it was so nearly true that in a year or two Douglas was established as one of the select coterie of best sellers. In 1920, or possibly earlier, one or two machines, including the Douglas and rivals which embody its principles, will repeat that ancient challenge, and every word in it will this time stand analysis. The smaller engine will give the required power, and evince the full standard of reliability. The economy will be there, and the comfort. Youngsters may continue to lug round one or more unnecessary cwt.s., but women will not, neither will men over thirty years of age. Weight reduction is a prime factor in the open market; and the firm which ignores the point will live to regret it. I go so far as to think that the production of a single first-class scooter would eat deeply into the motor cycle market, for thousands of people use their machines simply as short-distance conveniences. If you can get the work done by a machine scaling 100 lb., costing £30, and doing 150 m.p.g., why go in for 220 lb., £80, and 75 m.p.g.?

Incredible?

THE old yarn of the £10 Ford motor cycle was on the rounds once more last week. The daily press had the story again as usual without foundation. As we cannot get a push-bicycle, even of the gaspipe order, at such a figure, the story is obviously absurd. But I am perfectly prepared to credit that Ford can and will market a very usable motor bicycle at £25 if the fit takes him. It will not weigh 3 cwt. It will not develop a brake-horse-power running into double figures. But it will not sell a penny the less readily because of these peculiarities, and it would cause a very perceptible slump in the value of urban cottage property. After all, it was rather absurd that in 1914 in Detroit you could get a 20 h.p. five-seated car of very decent quality for £77, and that the cheap two-wheeler of any class obtainable in the same city cost over £50. This particular anomaly has never been realised over here, for the simple reason that this country has yet to produce its first really cheap car.



Mr. Trevor T. Laker, a well-known competition rider before the war, who is starting an aeroplane passenger service at Nuneaton at Whitsuntide.

176 Entrants for the London-Edinburgh Run.

Official List of Entrants, their Numbers, and Starting Times. Some Hints to Competitors. Catering Arrangements. The Course Described.

TO-MORROW evening (Friday) will see the start once more of the famous London-Edinburgh run, the popular event which the Motor Cycling Club ran every year without a break from 1904 to 1914. Now, after five weary years, this classic event will take place once more, and at 9 p.m. of the 6th inst. 176 competitors will start at half-minute intervals from the Old Gatehouse, Highgate, for their four hundred miles trip northwards.

Mr. H. J. C. Spring, proprietor of Ye Olde Gatehouse Hotel, Highgate, has undertaken to provide supper for competitors from 6.30 to 8.45 on the evening of the start. He is also prepared to fill vacuum flasks with hot coffee and to provide sandwiches to take away. Naturally, it will greatly facilitate his arrangements if those who desire supper, coffee, and sandwiches will notify him, so that he will know for how many to provide. Mr. Spring's telephone number is Hornsey 168.

This year there will be coffee and sandwiches at Biggleswade, the first stop, where are excellent foundations for the dreary drive through the hours of darkness; and the same fare will be on hand at the garage at Grantham.

In such places as York (second "breakfast") and Carlisle (lunch) it will probably be a case of first come first served, and the solo riders will (as it is right they should, since they have no accommodation for luncheon baskets) most likely score. All alcohol should be eschewed during the run, though perhaps a light wine at dinner before the start will do no harm.

The most important advice to competitors is that they should not forget to wind up and set their watches before the start.

The secretary of the A.A. has placed the A.A. road scouts at the disposal of the committee, so that the route should be well marshalled.

For the first time in the history of the London-Edinburgh run, thanks to the Daylight Saving Act, the competitors will start in broad daylight, and enjoy over an hour's run before it is completely dark. This will take them to Hatfield. Thereafter, the road is good and practically flat to Biggleswade. In the dark portions there are one or two awkward places, but these are usually marked by willing helpers with lamps shining or arrows. The first of these is in Baldock, where at the end of the wide main street competitors turn right, and then sharp left, after which there follows a wonderfully straight road right to Biggleswade. On entering the town competitors bear to the left, then proceed straight on, and pull up at the Swan Hotel. On leaving the town they bear sharply to the left over the river Ivel, and then strike northwards for Girtford, where the main road turns very sharply to the right over the Ivel. This is quite a dangerous spot, as the turning comes quite unexpectedly in the dark.

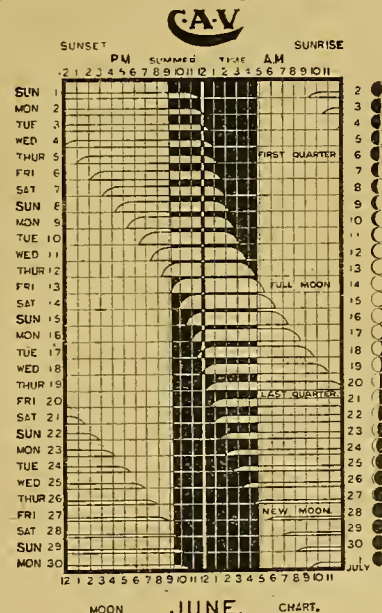
After this the course is straight forward to Tempsford, and about half a mile from this village the main road bears sharp

left, and it is quite easy to go straight on into St. Neots and Huntingdon unless the rider is careful. Here the left-hand road should be taken and the River Ouse crossed, after which competitors have no

This and the following page form a USEFUL GUIDE to Competitors and others interested in the London-Edinburgh Run, and we suggest that this copy of "The Motor Cycle" is carried by all who follow the event.

cause to worry, and a long easy run over straight road ensues to Wansford. Tomorrow the moon is one day over the first quarter and sets at 2.3 a.m., and so, given fine weather, the night portion of the trip should present few terrors to newcomers, who may be comforted by the fact that members of the committee, who know the road well, will be riding in front and will lead the way.

By means of the moon chart, reproduced here, and which is published by Messrs. C. A. Vandervell and Co., competitors can see at a glance that they



only have about three hours complete darkness. The sun sets just after the start, and it is not dark till one hour later, though lamps should be lit half an hour after sunset, and the moon will shine till after 2 a.m. The sun rises about a quarter to five, and so it should begin to get light at 3.45 a.m.

The Entrants and their Official Numbers.

	Time of Start.
1. Cooper, W. (2½ Douglas)	9 p.m.
2. Baddeley, L. A. (2½ Douglas)	9.0½
3. Olsson, V. (4 Douglas)	9.1
4. Sproston, A. J. (3½ Lea-Francis)	9.1½
5. Moffat, P. W. (3½ Douglas)	9.2
6. Boileau, E. M. P. (3 A.B.C.)	9.2½
7. Robbins, A. C. (2½ Wooler)	9.3
8. Hemy, W. C. (2½ Metro-Tyler)	9.3½
9. Scott, A. M. C. (5-6 James)	9.4

	Time of Start.
10. Armstrong, J. A. W. (3½ Lea-Francis)	9.4½
11. Williamson, R. L. (4 Triumph)	9.5
12. Notari, Fred. (4 Triumph)	9.5½
13. Ryeroff, N. (4 Triumph)	9.6
14. Reed, G. A. (2½ Coulson B.)	9.6½
15. Boxer, P. C. (4 Triumph)	9.7
16. Ross, T. J. (4 Triumph)	9.7½
17. Luigi, Mario (4 B.S.A.)	9.8
18. Lane, H. R. (4 B.S.A.)	9.8½
19. Cocks, A. G. (2½ Clyno)	9.9
20. Hall, S. (3½ Rover)	9.9½
21. Thompson, Tudor (2½ Douglas)	9.10
22. Walker, A. E. (2½ Hobart)	9.10½
23. Leather, R. T. (2½ Douglas)	9.11
24. White, P. W. (4 Triumph)	9.11½
25. Watson-Bourne, J. A. (4 Blackburne)	9.12
26. Weaver, T. H. (2½ Sirrah Vans)	9.12½
27. Nias, H. C. (3½ Rudge)	9.13
28. Preston, W. R. (3½ Sunbeam)	9.13½
29. Salter, F. E. (3½ Rudge)	9.14
30. Hunt, C. H. (3½ Zenith)	9.14½
31. Ronsley, F. H. (8 Zenith)	9.15
32. Udall, C. F. (2½ Chater-Lea)	9.15½
33. Pulham, Leslie (3½ Ariel)	9.16
34. Lake, W. J. (2½ Omega)	9.16½
35. Harrison, W. G. (3½ Norton)	9.17
36. Kidston, G. P. Glen (3½ Sunbeam)	9.17½
37. Pike, P. (2½ Levis)	9.18
38. Enticknap, P. J. (4 Blackburne)	9.18½
39. Arango, L. de (7 Harley-Davidson)	9.19
40. Hill, B. Alan (3½ Zenith)	9.19½
41. Harveyson, H. R. (6 Matchless)	9.20
42. Walker, H. (2½ Levis)	9.20½
43. Hull, J. F. (2½ Wooler)	9.21
44. Body, P. T. C. (3½ Sunbeam)	9.21½
45. Addingley, C. W. (3½ Humber)	9.22
46. Addingley, J. E. (4½ B.S.A.)	9.22½
47. Annon, George F. (2½ Metro-Tyler)	9.23
48. Smithies, J. (2½ Allon)	9.23½
49. Jameson, W. S. (6 A.J.S.)	9.24
50. Baddeley, D. S.	9.24½
51. Chidley, K. V. (2½ Wooler)	9.25
52. Sharp, J. E. (3½ Humber)	9.25½
53. Johnson, E. C. R. (3½ Humber)	9.26
54. Hewitt, A. H. N. H. (6 Zenith)	9.26½
55. Nicholson, L. (3½ Sunbeam)	9.27
56. Fleetwood, W. J. (2½ Douglas)	9.27½
57. Coulson, F. A. (2½ Coulson B.)	9.28
58. Phillips, H. (2½ Allon)	9.28½
59. McClude, Alec (2½ Allon)	9.29
60. Clules, L. E. (2½ Allon)	9.29½
61. Vickers, Phillip (3 A.B.C.)	9.30
62. Simms, B. H. (4 Triumph)	9.30½
63. Charlesworth, R. C. (5 Zenith)	9.31
64. Rutherford, T. (3½ Sunbeam)	9.31½
65. Rideout, F. G. (2½ Coulson B.)	9.32
66. Brown, J. Robertson (8-10 Henderson)	9.32½
67. Reyre, H. (4½ James)	9.33
68. Boby, R. S. P. (3½ Norton)	9.33½
69. Kingwell, A. N. (2½ Douglas)	9.34
70. Ball, F. C. (2½ Douglas)	9.34½
71. Wray, George (3½ Triumph)	9.35
72. Nicholson, Charles (3½ Sunbeam)	9.35½
73. Bateman, H. G. (2½ Diamond-J.A.P.)	9.36
74. Smart, K. de B.	9.36½
75. Bridgman, E. A. (7 Indian Sidecar)	9.37
76. Applebee, F. A. (7 Indian Sidecar)	9.37½
77. Haslam, J. (4 Douglas Sidecar)	9.38
78. Fletcher, Gordon (4 Douglas Sidecar)	9.38½
79. Gibb, W. B. (3½ Douglas Sidecar)	9.39
80. Dover, F. (4 Douglas Sidecar)	9.39½
81. Garrett, S. F. (8 Blackburne Sidecar)	9.40
82. Holroyd, J. S. (9 Blackburne Sidecar)	9.40½
83. Gibson, Hugh (8 Clyno Sidecar)	9.41
84. Stevens, J. (6 A.J.S. Sidecar)	9.41½
85. Davis, R. C. (8 Chater-Lea Sidecar)	9.42
86. McKenzie, Jas. (6 Humber Sidecar)	9.42½
87. Mabon, A. (4 Mabon Sidecar)	9.43
88. Fell-Smith, W. A. (7 H.-Davidson Sc.)	9.43½
89. Carton, Ado. (7 Indian Sidecar)	9.44
90. Jacobs, W. A. (6 Rex Sidecar)	9.44½
91. Le Grand, J. P. (6 Rex Sidecar)	9.45
92. White, Frank (6 Rex Sidecar)	9.45½
93. Walker, P. D. (4½ B.S.A. Sidecar)	9.46
94. Stocks, J. L. (3½ Ariel Sidecar)	9.46½
95. Saddington, H. H. (5-6 James Sidecar)	9.47
96. de la Haye, T. C. (3½ Sunbeam Sc.)	9.47½
97. Witt, T. H. L. (6 Enfield Sidecar)	9.48
98. Johnson, E. C. (4 Douglas Sidecar)	9.48½
99. Masters, J. A. (7 Harley-Davidson Sc.)	9.49
100. Thompson, Thompson (4 Douglas Sc.)	9.49½
101. Hilger, John (3½ Rover Sidecar)	9.50
102. Read, A. J. (8 Sunbeam Sidecar)	9.50½
103. Don, Kaye (8 Zenith Sidecar)	9.51
104. Milton, E. (6 A.J.S.)	9.51½
105. Douglass, F. H. (7 Harley-Davidson)	9.52
106. Tippet, N. P. (4 Rex)	9.52½



A HEAVY TWIN AS A SOLO MOUNT.

Some Personal Experiences with a "Victory" 8 h.p. Matchless.

ALTHOUGH there are hundreds of heavy twin sidecar outfits on the road at the present time, it is comparatively seldom that one comes across a heavy 1,000 c.c. twin, primarily designed for sidecar work, that is in daily use as a solo mount.

At the end of 1918 a lucky chance enabled the writer to pick up a practically new Victory model Matchless combination at a moderate price, which bargain was eagerly snapped up, and this somewhat extra-heavy motor cycle, built originally for machine-gun service in Russia, has since been ridden solo over 1,500 miles.

During this distance not a single mechanical failure has been experienced, and, with the exception of three or four punctures, all has gone well.

The sensation of bestriding such a heavy machine, fitted with 700 mm. x 80 mm. Hutchinsons (not blown up brick-hard), must be experienced to be realised.

Easy to Ride.

When once in the saddle, the motion from 4 m.p.h. to 50 m.p.h. is quite perfect, and, were it not that this particular machine is much under-geared for solo work, this latter speed could be easily bettered by 20% without detriment to one's personal comfort.

The gear ratios are approximately 5 to 1, 7½ to 1, and 12 to 1, so that it will be seen the 1,000 c.c. J.A.P. would, if necessary, lug the machine up a mountain side on the low gear; and it is comforting to think that the machine will climb anything, provided the back wheel can get a grip.

The steering and general balance are excellent, and these do not appear to be affected by either speed or road surface.

Of late the roads (!) within a thirty miles radius of London have been thoroughly explored: the condition of these "tracks" must be personally tested to be fully appreciated.

Heavy to Push.

The road between Acton and Uxbridge, and for five miles beyond the latter town, easily wins the first prize, it being impossible to remain on the saddle for stretches of one hundred yards at a time. These bits had to be traversed by pushing the Matchless (and luggage): no light task.

However, good, and even excellent, roads are still to be found, especially in the Midlands; and on these the entire absence of vibration and rattle makes the heavy machine a real joy to handle, and does away with any sensation of fatigue, even after the longest journeys.

The 8 h.p. Matchless, which the owner used as a solo mount for 1,500 miles.



Of recent long distance trips, a run from Coventry to Eastbourne (162 miles), *via* Oxford, Reading, and Horsham, in six hours is a good example. This journey was undertaken on a Saturday afternoon "against time," as it was impossible to start before 2.30 p.m., and only two stops were made for replenishments *en route* (Wallingford and Horsham).

Average Speeds.

Though a high average speed is possible on a machine of this description, perhaps the speediest trip was from Warwick to Banbury in the early morning, a distance of nineteen miles, which was covered in under the half-hour. This particular road is excellent, and but for a couple of cows, nothing impeded the speed which at times was a trifle alarming.

As a matter of fact, the pace was maintained as far as High Wycombe (a further sixty-five miles), which was reached in 1h. 40m. from Banbury.

The comparatively low top gear considerably assists the average speed on long trips, and enables a sidecar to be towed without much difference in maximum speeds, except, of course, on steep hills which, solo, the machine would naturally romp up on top.

The highest speeds so far registered by the Stewart speedometer have been 52 m.p.h. (solo) and 44 m.p.h. with the sidecar; but, to prove that a good average can be maintained with full load, a run of 102 miles, between Stamford and London, was accomplished with a fourteen-

stone and rather frightened passenger in four hours exactly, and this with a pile of Easter holiday luggage.

M.P.G.

The petrol consumption works out at about 55 m.p.g. solo, and in the neighbourhood of 40 m.p.g. with a sidecar, though this could be improved considerably if the writer was willing to sacrifice the remarkably slow running quality of the carburetter for the sake of adding a mile or two extra to the gallon.

To sum up, for an enthusiastic rider the heavy twin for solo work scores every time, but naturally does not recommend itself to any but the somewhat muscular motor cyclist. For this type of rider nothing could be better than the big Matchless. The sensation of overtaking and sweeping past another machine, on a hill especially, is one of the most satisfactory of motor cycling experiences, and is partly responsible for the writer having become an ardent advocate of the big twin for solo work.

B.

THE BUYERS' GUIDE.

Current Prices and Delivery Dates for 1919 Motor Cycles.

Make.	H.P.	Particulars in Brief.	Price.	Delivery.	Make.	H.P.	Particulars in Brief.	Price.	Delivery.
			£ s. d.					£ s. d.	
A.B.C.	3	Spring frame, 4-speed, flat twin	85 0 0	—	JAMES	4½	No. 6, single, 3-speed ..	98 0 0	—
ABINGDON	3½	3-speed	85 0 0	Delivery six to	JAMES	3½	No. 7, V twin, 3-speed ..	98 0 0	—
ABINGDON	6-7	3-speed	100 0 0	eight weeks.	JAMES	2½	No. 8, 2-stroke, 2-speed ..	60 0 0	Delivery com-
A.J.S.	6	Twin, 3-speed	119 5 0	Delivery com-	JAMES	5-6	No. 9, twin, 3-speed ..	99 15 0	menced.
A.J.S.	6	Sidecar combination ..	148 0 0	menced.	JAMES	—	Sidecar Canoelet	24 15 0	—
ALLON	2½	2-stroke, 2-speed, clutch, and kick-starter ..	65 0 0	Delivery com-	JAMES	—	Sidecar de luxe	28 17 6	—
ARIEL	3½	3-speed	85 0 0	menced.	LEVIS	2½	2-stroke, single-gear ...	43 13 0	Entire output
ARIEL	5-6	Twin, 3-speed	100 0 0	Delivery com-	L.M.C.	4½	ditto	85 0 0	booked.
ARIEL	6-7	Twin, 3-speed	100 0 0	menced.	L.M.C.	6	Twin ditto	95 0 0	Delivery com-
ARIEL	—	Sidecar	30 0 0	—	—	—	—	—	menced.
BLACKBURN	2½	4-stroke, 2-speed, clutch ..	60 0 0	—	MATCHLESS	8	Combination	140 0 0	—
BLACKBURN	4	3-speed	82 0 0	—	METRO-TYLER	2½	2-stroke, single-speed ..	49 9 0	Delivery
BLACKBURN	8	Combination	125 0 0	—	METRO-TYLER	2½	2-stroke, 2-speed	57 4 0	commenced.
BRADBURY	2½	4-stroke, 350 c.c., 2-sp.	68 0 0	—	MORCAN	8	Sporting model	145 0 0	Delivery com-
BRADBURY	4	Single gear	75 0 0	Delivery com-	MORCAN	8	G.P., J.A.P. engine	155 0 0	menced.
BRADBURY	4	Single, 3-speed, chain ..	92 0 0	menced.	MORGAN	8	De luxe, M.A.G. (w.c. J.A.P. (10 extra) ...	150 0 0	Entire out-
BRADBURY	6	Twin, 3-speed, chain ..	112 0 0	—	—	—	—	—	put for 1919
BRITISH EXCELSIOR ..	2½	2-stroke, 2-sp. counter-shaft, kick-starter ..	63 0 0	Delivery com-	—	—	—	—	booked by
BRITISH EXCELSIOR ..	2½	2-stroke, 2-speed	58 16 0	menced.	—	—	—	—	various
BRITISH EXCELSIOR ..	2½	2-stroke, single gear ..	50 0 0	—	—	—	—	—	agents.
BRITISH EXCELSIOR ..	6 or 8	3-speed, combination ..	150 0 0	—	NEW IMPERIAL	2½	J.A.P. engine, 2-speed ..	50 8 0	Delivery com-
B.S.A.	4½	All-chain drive	81 18 0	—	NEW IMPERIAL	2½	J.A.P. engine, 2-speed, clutch	58 16 0	menced
B.S.A.	4½	Chain-cum-belt	79 16 0	—	NEW RIDER	2½	Combination	132 6 0	—
B.S.A.	3½	Single gear	66 3 0	—	NEW RIDER	2½	2-stroke, single speed ..	48 0 0	At once
B.S.A.	—	Sidecar	29 8 0	—	NEW RIDER	2½	2-stroke, 2-speed	55 14 0	—
CALTHORPE	2½	J.A.P. engine, 2-speed ..	52 0 0	Delivery com-	NORTON	3½	All-chain drive	91 7 0	Delivery com-
CALTHORPE	2½	2-stroke, 2-speed	50 0 0	menced.	NORTON	3½	T.T., c/shaft, all-chain ..	89 5 0	menced.
CARFIELD	2½	2-stroke, 2-speed	51 0 0	Delivery com-	NORTON	3½	Single-gear, B.R.S. eng.	76 13 0	—
—	—	—	—	menced.	NORTON	3½	ditto, with B.S. engine	84 0 0	—
CONNAUGHT M'ture ..	2½	2-stroke, single-speed ..	78 0 0	—	NORTON	3½	Standard, T.T., all-belt ..	66 3 0	—
CONNAUGHT M'ture ..	2½	2-stroke, 2-speed	46 0 0	Delivery	—	—	—	—	—
CONNAUGHT Stand'd ..	2½	2-stroke, single-speed ..	42 0 0	commenced.	—	—	—	—	—
CONNAUGHT Stand'd ..	2½	2-stroke, 2-speed	49 15 0	—	OMEGA	2½	4-stroke, 2-speed	53 11 0	Delivery com-
CONNAUGHT Stand'd ..	2½	2-stroke, 2-speed, clutch ..	58 0 0	—	—	—	—	—	menced.
COULSON B.	2½	4-stroke, spring frame ..	69 6 0	Three or four weeks	OVERSEAS	3½	3-speed	80 0 0	Delivery com-
COVENTRY EAGLE ..	2½	2-stroke	47 5 0	—	OVERSEAS	6	Twin, 3-speed	92 0 0	menced
COVENTRY EAGLE ..	2½	ditto, 2-speed	51 12 0	—	P. and M.	3½	R.A.F. model	85 0 0	Delivery com-
COVENTRY EAGLE ..	2½	J.A.P.	47 5 0	Delivery com-	P. and M.	3½	Combination	113 0 0	menced
COVENTRY EAGLE ..	2½	ditto, 2-speed	54 12 0	—	RADCO	2½	2-stroke, single-gear ...	39 13 9	Delivery
COVENTRY EAGLE ..	3½	S.A. countershaft 3-sp ..	82 19 0	—	RADCO	2½	2-stroke, 2-speed	48 7 0	commenced.
DIAMOND	2½	J.A.P. Enfield 2-speed ..	60 18 0	Delivery com-	REX	4	3-speed	82 10 0	Shortly
DIAMOND	2½	2-stroke	47 5 0	menced.	ROVER	3½	Single-speed	67 0 0	—
DIAMOND	2½	2-stroke, 2-speed	56 14 0	—	ROVER	3½	Phillipson pulley	72 0 0	—
DOT	8	Combination	140 0 0	—	ROVER	3½	3-speed	85 0 0	Delivery com-
DOT	3	Twin, 2-speed	70 0 0	—	ROVER	3½	Combination	117 10 0	menced.
DOT	3	Twin, 2-speed	55 0 0	—	ROVER	5-6	3-speed	100 0 0	—
DOUGLAS	2½	W.D. model	65 0 0	Delivery com-	ROVER	5-6	Combination	132 10 0	—
DOUGLAS	4	W.D. model	85 0 0	menced	ROYAL RUBY	6 or 8	Twin, 3-sp. combination ..	141 15 0	Output booked
DOUGLAS	4	Combination	110 0 0	—	ROYAL RUBY	2½	2-stroke single-gear ...	40 0 0	—
ENFIELD	2½	2-str., 2-sp., chain drive ..	52 11 0	—	SEARKBROOK	2½	2-stroke, single-speed ..	46 4 0	Shortly.
ENFIELD	3	4-stroke, twin, 2-speed ..	69 6 0	—	SEARKBROOK	2½	2-stroke, 2-speed	52 10 0	—
ENFIELD	6	Combination, model 180 ..	126 0 0	Shortly	SUNBEAM	—	Sidecar for 8 h.p.	36 15 0	—
ENFIELD	8	Combination, model 190 ..	147 0 0	—	SUNBEAM	—	Sidecar for 3½ h.p.	28 7 0	Delivery com-
G.N. CYCLE CAR ..	10	2-cyl., Standard model ..	140 0 0	September.	SUNBEAM	3½	3-speed, all-chain	96 12 0	menced.
G.N. CYCLE CAR ..	10	2-cyl., Vitesse model ..	170 0 0	—	SUNBEAM	8	3-speed, all-chain	120 15 0	—
HUMBER	3½	Flat twin, 3-speed	85 0 0	Three months.	SUN-VITESSE	2½	2-stroke, single-speed ..	43 10 0	Shortly.
—	—	—	—	—	SUN-VITESSE	2½	2-stroke 2-speed	55 0 0	—
IVY de LUXE	2½	2-stroke, single-speed ..	45 3 0	—	TRIUMPH	1	W.D. model	92 0 0	Delivery com-
IVY de LUXE	2½	ditto, 2-speed	53 15 0	—	TRIUMPH	2½	2-stroke, 2-speed	60 0 0	menced.
IVY de LUXE	2½	1.O.M. model, single-sp.	48 7 6	—	VELOCETTE	2½	2-stroke, 2-speed	48 0 0	—
IVY de LUXE	2½	ditto, 2-speed	56 19 6	—	WOLF	2½	2-str., 2-sp.	48 0 0	—
IXION	2½	2-stroke, single-speed ..	42 0 0	Delivery com-	WOOLER	2½	2-stroke, variable gear ..	61 19 0	—
IXION	2½	2-stroke, 2-speed	50 0 0	menced	WOOLER	2½	Flat twin, 4-stroke ...	61 19 0	—
IXION	2½	2-stroke, 2-speed, lady's	56 0 0	—	—	—	—	—	—

READERS' ROAD REPORTS.

A SELECTION from the many road reports received from readers is given below:

YORKSHIRE.—Middlesbrough to Saltburn: This road is now being repaired, but stretches are still in a shocking condition. Middlesbrough to Sunderland: By the transporter bridge this road is fair as far as Ryhope, whence into Sunderland it is very bad. Sunderland to Newcastle: This road is very bad indeed. The East Boldon to Sunderland stretch has been renovated in places, but is getting cut up again by the heavy traffic. Middlesbrough to

Darlington: Bad to Stockton; thence good to Darlington. Middlesbrough to Whitby: Not very good to Guisborough; thence not bad. Practically all the roads near and around manufacturing centres like Middlesbrough, Sunderland, South Shields, Stockton, etc., are very bad indeed. Away from these the roads are, on the whole, not bad.

Farnham to Plymouth: The Winchester-Salisbury road is very good. There is a bad patch on the Sherborne side of Yeovil, just outside the town, and others on either side of Shaftesbury, but none of them

serious. A road to be avoided by motor cyclists is the one from Chudleigh to Kingsteignton, en route for Newton. Entering Plymouth, the road following the Plym, from Laira Bridge to Plympton toll bridge, should be avoided and the town entered from the north-east via Mutley Plain. With the above exceptions, the roads on the route, Alton, Winchester, Salisbury, Yeovil, Chard, Honiton, Exeter, Chudleigh, and Totnes, are surprisingly good.

Glen Eagles (Auchterarder to Murchart): This road is practically impossible now for motor cycles.

THE ARBUTHNOT TROPHY.

Competition Rules and Details of a Sporting Naval Event Next Month.

WE are now able to publish particulars relating to the Arbuthnot Trophy trial, to be held under the competition rules of the Auto Cycle Union on Friday and Saturday, July 4th and 5th. In framing the rules the A.C.U. Competitions Committee has endeavoured to promote a sporting event which would have appealed to the gallant officer whose name the trophy bears. It is intended that a similar trial, or some other form of competition, shall be held annually, the holder of the trophy being eligible to compete free of entry fee. The trial this year will occupy two days, and the total distance will not exceed 250 miles. The start and finish will be at Plymouth.

General Conditions.

It may be remembered that this important competition, which is quite unlike any other which has ever been held, was the outcome of a suggestion made by *The Motor Cycle*, which was instrumental in collecting the fund for the purchase of the trophy, and in getting it executed by Lady Scott, the widow of the famous explorer.

Although it had been finally decided that the trial should be open to any officer in H.M. Navy, at the last moment the Competitions Committee of the A.C.U. also made it open to any officer of the Royal Naval Reserve, or Royal Naval Volunteer Reserve, on the active service list on the date on which entries close, which is 5 p.m. on Monday, the 23rd inst. Each entry must be accompanied by a fee of one guinea, and if the entrant is not already on the competition register of the Union, by the application for such registration, the fee for which is 5s., or, in the case of a member of a club affiliated to the Auto Cycle Union, 2s. 6d.

The course each day will be between 100 and 150 miles in length, and details will be published the day previous to the trial. A competitor may not leave the

course under any circumstances, and may be disqualified or otherwise penalised should he do so.

Competitors' motor cycles must be driven under their own power only throughout the trial, during which their road wheels may not be brought to rest under any circumstances whatever, except for exigencies of traffic and at the official controls. Pedalling or running alongside is prohibited, as is kicking on the ground for purposes of propulsion. Outside assistance, or assistance by another competitor, is forbidden.

The maximum time allowed for a competitor to cover each section will be that requisite for an average speed of 18 m.p.h., whilst the minimum time allowed shall require an average speed of 20 m.p.h., allowances being made for ten-mile limits, difficult country, etc. Arrival times will be taken at the finish of each section only, namely, at the luncheon control, the test hill, and finish each day. The earliest and latest times of arrival at all important points will be shown on each competitor's route card. There will be no secret checks.



THE ARBUTHNOT TROPHY.

Designed and executed by Lady Scott, and subscribed for by the motor cycle public to perpetuate the memory of the late Rear-Admiral Sir Robert Keith Arbuthnot, Bt., K.C.B., M.V.O., who gave his life for his country at the Battle of Jutland.

Any competitor not ready to start at the appointed time will be disqualified. The order of starting will be by ballot each day, and the first competitor will start at 8.30 a.m.

Throughout the trial, no adjustments, repairs, or replenishments of any competitor's motor cycle, including repairs or replenishment of tyres, may be carried out, except that a replenishment of oil, petrol, and water is permitted during the luncheon control.

Efficient silencers must be fitted, and any competitor who, in the opinion of the stewards, fails to comply with this regulation will be disqualified.

Defining the Winner.

A "consistent driving" test will be held on the same hill each day, the ascent of the hill being part of the route of the trial. The hill will be divided into two parts, the first part to be climbed at an average speed of not more than 10 m.p.h., and the second part at an average speed of not less than 15 m.p.h. The difference between the time taken by a competitor to climb the slow and the fast parts of the hill respectively will be noted each day, and the competitor who most nearly repeats on the second day his performance of the first day shall be adjudged the winner of this test.

Every competitor who completes the trial according to these regulations will be awarded a silver medal, and the trophy will be held by one of the medal-winners who makes the best performance in the consistent driving test.

If no competitor succeeds in completing the trial according to these regulations, the competitor who makes the fewest number of involuntary stops will hold the trophy, or if such number of stops is the same for more than one competitor, then, of these competitors, the one who makes the best performance in the consistent driving test.



Plain Talk to American Motor Cycle Manufacturers.

VERY often British motor cyclists point to American machines as being a standard which manufacturers should aspire to obtain for colonial models. It has been said that the average British machine is too light for service overseas, yet an American dealer appeals to makers in the United States to make their machines lighter.

"Now think a minute," he says. "In 1912 we had some real motor cycles, lots of power, light in weight, and could handle them without letting them fall on us and break a leg. The small man mastered his machine, and now it takes a husky 'six-footer' to ride one."

"Let us sit in a comfortable position and not with our knees up under our chins, with all our weight on the saddle and our feet up alongside the front wheel."

"Now for a sidecar. Let's have a slow-speed motor, about 1,150 c.c., low compression, one that will run standing

still for a few hours without burning up, and cut the speed all out. Just let it pull a sidecar 40 m.p.h., and keep doing it! and a frame for sidecar work only, no spring frames. You wouldn't have springs on one side of your car at the rear end; this throws you out of balance. For sidecar work, your rear wheel doesn't set up straight now. Give us a lot of clearance for mud chains, a waterproof magneto, and spark plug connections that will stand a splash of water; a front guard that will keep us from getting drowned when we hit water. Make it entirely different from anything you now have. Give us a front fork with rocker arms and pins that won't have to be replaced every thousand miles. Give us a transmission for sidecars—one that won't strip and get out of order. If you can't build three speeds right, give us two speeds that are right. Give us sidecar clearance as much or more than a

'flivver.' If this outfit costs as much as a 'flivver,' let's have it. Then we could go when we wanted to, and get back and run so much cheaper than we do now. Remember this sidecar motor and machine is to be for sidecars only.

"Now, Mr. Manufacturer, your high-salaried men who design these two-wheelers sit in soft chairs and ride in Packards, and have a line of argument that would make a common motor cycle rider get down on his knees and ask to be forgiven for what he mentioned about improvements; they know, course they do! They draw from five to ten thousand a year, and do what the directors tell them to do in order to make big profits, and keep from changing any machinery. But, nevertheless, keep an eye on Henry Ford; he got by nicely, and you all laughed at his product in 1908. Ten years later he couldn't spend all of his money—because he made it in quantities."

Sidecarring with a 400 c.c. Flat Twin.

First Impressions of the A.B.C. Sidecar on the Road.

SO much interest has been displayed in the A.B.C. motor cycle, which hitherto has been seen by the majority only on paper, that some further details of its running are certain to be welcomed by our readers.

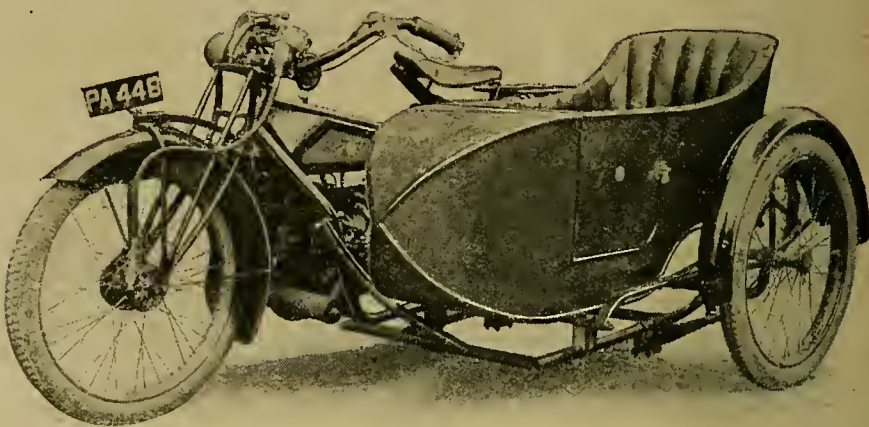
During a recent week-end we covered ninety miles solo and some seventy-five miles with a sidecar on a machine which is the prototype of the production models which the Sopwith Co. will launch on the market.

This early model, though it possesses certain faults which, we understand, will not be present in the later types, would satisfy the most critical motor cyclist.

These difficulties are a bad carburetter, which refuses to fire regularly under 17 or 18 m.p.h. on top gear and remarkable oil slinging propensities. In the later models a new carburetter will be fitted, and an improvement made in the crank case design, which will remedy the other trouble.

We drove the machine home without a passenger in the sidecar, and found that even over quite rough surfaces the outfit held the road extremely well. The sidecar, though not a luxurious affair, is of medium height, and comfortable, not because of the soft padding of the cushions, but owing to the excellent springing of the axle, which is mounted on quarter elliptical springs while the body is fixed on C springs.

Our first surprise came when we climbed a long and trying hill on top speed at 36 m.p.h. over the crest, and realised that the little 400 c.c. engine had made an



The 3 h.p. A.B.C. with a sidecar fitted with a sprung axle.

ascent equal to that of a 30 h.p. Lancia car which we had driven over the same road a week or two before.

40 m.p.h. with Sidecar.

Later the same evening we took a passenger for a short trial spin, touched nearly 40 m.p.h. on a slight up grade, and climbed a hill of average steepness at 30 m.p.h. On the return trip 42 m.p.h. was attained. The next day we drove the machine with a passenger over various by-roads in ordinary undulating country, and never used a lower speed than third, but we finished up with the impression that the 3 h.p.

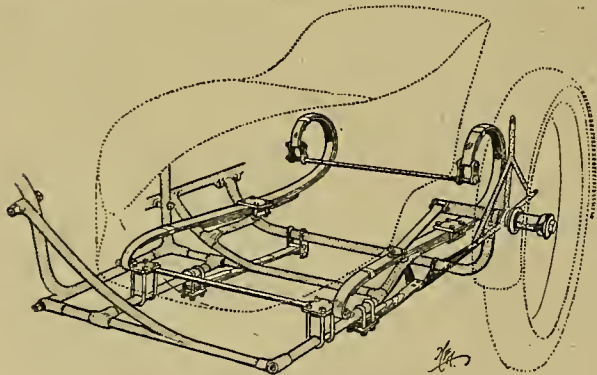
A.B.C. laden with one passenger and luggage will go practically anywhere in Great Britain, and be capable of climbing such hills as Birdlip or Sutton Bank under these conditions. Would that either had been close at hand so as to make the attempt! No matter how severely the engine was abused, it was impossible to make it knock, no matter whether the spark was fully advanced and the throttle suddenly opened on a hill.

The next day we removed the sidecar, and drove the machine up the Great North Road as far as Buckden. The surface was good on the whole, but where ordinary pot-holes occur these are hardly noticeable, so excellent is the springing, which with the Brooks saddle renders the A.B.C. luxuriously comfortable, there being an entire absence of unpleasant "rebound."

The Machine Criticised.

The steering is good on the whole, but wider handle-bars would, we think, be desirable, as the steering at low speeds was not very steady. Critics who have not tried the machine have suggested that with the machine set across the frame cornering would be difficult. This we did not find to be the case, as ordinary curves in the road could be taken at a good swinging pace. Needless to say, the engine is, to all intents and purposes, vibrationless, but the valves are a trifle noisy. Doubtless some of the noise could have been eliminated by careful tappet adjustment, but on the whole we are inclined to think that the slight clatter is the penalty of efficiency—a fault found in many motor cycle engines.

We are greatly looking forward to a closer acquaintance with the production model A.B.C., with its new carburetter, improved crank case, tool box under the footboards, and Lucas dynamo lighting set.



A.B.C. double-sprung sidecar chassis.

MOTOR CYCLING AND HEALTH.

THE fact that large numbers of doctors use motor cycles for their rounds is in itself a proof that the motor bicycle is a means of locomotion which can do no physical damage to the ordinary individual. In nine cases out of ten, if any doctor advises a man to give up motor cycling he is not a motor cyclist himself, and the advice of a doctor who is one should be sought before the idea of the patient riding a motor cycle is given up.

There is no doubt whatever that motor cycling is just as healthy an occupation

as exists. It is a means of getting fresh air, and of invigorating both body and mind, and is the greatest benefit to the worker in the town; but there is just one point to which the attention of the beginner should be called.

Many men, especially those who are just emerging from the prime of life into middle age may find that the first few miles on a motor bicycle or motor cycle and sidecar will cause various aches and pains, and a certain amount of fatigue, which may frighten him from continuing the pastime. The reason for these aches

and pains is not far to seek, and they are not serious. They simply mean that the riding of a motor bicycle brings fresh muscles into play.

Those who think of giving up motor cycling because they have suffered after a first ride should try to bear in mind the agonies of a man who has once ridden a horse, then given it up, and taken to it again, and his sufferings after his first ride. These are not to be compared with the paltry aches and pains that the unpractised motor cyclist may be called upon to experience. AILETTE.

CURRENT HAT

Times to Light Lamps.

SUMMER TIME.

June	5th	...	...	9.41 p.m.
"	6th	...	...	9.42 "
"	9th	...	...	9.44 "
"	11th	...	...	9.46 "

Summer Number on June 19th.

A fortnight hence, a special Summer Number of *The Motor Cycle* will be published. Definite orders should be placed with newsgents.

The Oldest Motor Cyclist.

We personally know a motor cyclist over sixty years of age. Others of mature years are to be seen on the road, and it would be interesting to know who is the oldest motor cyclist. Will these young-old riders send their photographs and brief particulars of their experiences?

Speed Limit.

Active co-operation by motorists using the Exeter-Plymouth road near Chudleigh is solicited by the R.A.C. in opposing the application for a ten-mile speed limit made by the Devon County Council, and now before the Local Government Board.

M.C.C. Team Trial for "The Motor Cycle" Cup.

The Motor Cycling Club has fixed a date in September for the inter-club team trial for the fifty-guinea cup presented for this purpose by *The Motor Cycle*. There is every prospect of this competition being held, provided there is sufficient support from the clubs.

Secretaries of motor cycling clubs who are able to send a team to compete in this popular competition are requested to communicate with the secretary of the M.C.C., Mr. Southcomb May, 34, Gower Place, London, W.C.1.

The P.S.M.C.C. and the Arbuthnot Trophy.

Naval officers who intend entering for the Arbuthnot Trophy are reminded that, if they are members of a club affiliated to the Auto-Cycle Union, they are entitled to be placed on the A.C.U. register of competitors at half fees, a procedure which is necessary, as the competition is counted as an open trial.

A suitable club affiliated to the A.C.U. which they may care to join is the Public Schools Motor Cycling Club—secretary, Mr. H. B. Browning, R.G.A., River Bank, Staines.

Officers who were educated in the *Britannia*, at Osborne, Dartmouth, or any of the recognised public schools, are eligible for membership of this club.

London-Edinburgh Run.

Readers who desire to see something of the London-Edinburgh run will find much useful information in this issue of *The Motor Cycle*. They should carry a copy with them.

Spectators who turn out during the hours of darkness to cheer the competitors on, should turn their motor cycles so that their lamps face northward. There is nothing more disconcerting to competitors than to meet motor cycles with head lights which shine directly into their eyes.

Petrol Tins.

Some curious situations are arising from the increase of charge for spirit cans to 3s. Some dealers insist on 3s. for every can, new or old, while others only charge the new price for cans stamped with that figure. An instance brought the state of confusion existing to our notice. Purchasing a tin of spirit, the garage proprietor offered us an unmarked tin for which he wanted to charge 3s. We offered him a tin in exchange, but he would only allow 2s. for it. Fortunately, it was a tin which had been sold us the night before by his man, who confirmed our statement with satisfactory results. It would appear that some definite ruling on the matter, however, is necessary.

Special Features.

GUIDE TO THE LONDON-EDINBURGH RUN.

THE HEAVY TWIN AS A SOLO MOUNT.
TWO NEW SCOOTERS.

Beware near Chislehurst.

There is considerable police activity round Chislehurst, the police being very keen on securing summonses for inefficient silencers, and also for exceeding the speed limit. The traps are worked on the Royal Parade and on the main road.

Fighting Unfair Trading.

The solicitors to the A.C.U. obtained judgment for the full amount claimed from a motor dealer who, having already sold a machine, effected a resale of the machine which he was supposed to be keeping for the original purchaser. The A.C.U. endeavoured to obtain a second-hand machine of similar make for the victimised purchaser, but found this practically impossible, and therefore ordered a new machine. Thus, the defaulting dealer was given a deserved lesson on the danger of profiteering and sharp practice.



Since the removal of petrol restrictions motor cycling has again become very popular in the navy. In a large ship the machine can be kept on board, and even ridden round the quarter-deck for testing purposes. This photograph of a Douglas owner was taken aboard H.M.S. Barham.

A Midland Rendezvous.

The George in the Tree Hotel at Berkswell is well-known to Midland motor cyclists, who will be interested to know that it has been taken over by Lt. A. Milner, the competition rider, who intends making it a high-class motor cyclists' rendezvous.

Police Traps.

There is a police trap at the foot of Harrow Hill on the Sudbury side. The gradient is rather stiff and riders of single-gear motor cycles must rush it and are consequently caught.

Motor cyclists are being stopped in Hounslow to see if their machines are properly equipped with two brakes, that the number plates are of the correct size, and that the silencers are efficient.

A £25 Miniature.

We have received preliminary particulars of a small machine known as the Motocyclette, sold at £25 by the United Industries, 26, Ludgate Hill, London, E.C.4. This consists of a motor attachment fitted to an ordinary pedal cycle. The power unit is a 1 h.p. two-stroke engine, fitted with a Wizard damp-proof magneto, Sentinel carburetter, handle-bar control, 3in. cord leather belt drive, hub and rim brakes, and a petrol tank holding 1½ gallons of fuel. It is designed for a speed of twenty-five miles an hour, and is claimed to do 100 miles to the gallon of fuel. The cost of the unit excluding the bicycle is £17, and it is claimed that it will fit any pedal cycle without brazing lugs or to altering the frame.

Birmingham - Land's End Trial.

THE following entries have been received for the Lycett Trophy two-day event during the coming week-end:

E. Kickham (3½ Sunbeam sc.)
G. Kuhn (2½ Lewis)
F. J. Watson (3½ Ariel sc.)
A. H. Johnston (2½ Allon)
C. H. Arkwright (2½ New Imperial)
E. R. Troward (2½ Metro)
E. Henrie (2½ New Imperial)
W. A. Bown (2½ Bown-Villiers)
S. Wright (3½ Humber)
R. W. Duke (4 Triumph)
M. G. Silver (4 Quadrant)
T. Silver (8 Quadrant)
S. Rodway (4 Norton sc.)
G. A. Dalby (4 Triumph)
G. A. Dingle (4 Triumph)
H. B. Denley (8 Morgan)
H. Poole (6 A.J.S. sc.)
H. O. Heith (2½ A.J.S.)
F. W. Gies (6 A.J.S.)
R. Baker (4 Triumph)
H. Jones (3½ Sunbeam)
W. N. Tetley (3½ Sunbeam)
E. Arch (8 New Imperial sc.)
J. E. Greenwood (8 Sunbeam)
T. Stevens (4 James sc.)
H. R. Fowler (5-6 James sc.)
L. Clark (5-6 James sc.)
H. Boynton (5-6 James)
K. E. Hay (5 Hazlewood)
H. Edwards (4 Sunbeam)
E. Kibble (4 Triumph)
L. Baker (4½ B.S.A. sc.)
S. T. Hill (5-6 James sc.)
O. Oerton (4½ Ariel sc.)
L. Newey (4½ Ariel sc.)
W. E. Emery (3½ Rudge Multi)
E. W. Cholderoff (4 A.J.S.)
S. Pettit (5-6 James sc.)
H. P. Cutler (4 Norton sc.)
R. H. Nicholls (4½ B.S.A. sc.)
F. T. Watson (4 Norton sc.)
A. P. A. Rose (8 Royal Ruby sc.)
V. G. Webb (2½ Douglas)
H. D. Meade (2½ N.U.T.)
H. A. Pattman (4 Norton sc.)
R. W. Vaughan (5-6 James sc.)
F. E. Mucklow (4½ James sc.)
T. Pollock (5-6 James sc.)
H. I. Stretton-Ward (4 Triumph)

Price of Petrol.

The Petroleum Times says there is very little prospect of the price of petrol coming down to pre-war level.

THE MOTOR CYCLE SUMMER NUMBER JUNE 19th,

Will contain many SPECIAL ARTICLES of interest to all motor cyclists, including

HERE TO GO FOR THE SUMMER TOUR

Written by motor cyclists familiar with the districts they describe.

A REVIEW OF DESIGN IN 1919.

THE FAMILY SIDECAR.

The most popular vehicle on the road, and why.

THE YOUTHFUL MOTOR CYCLIST.

Why the motor cycle appeals to the young man.

NO AGE LIMIT.

The motor cycle as a suitable mount for the man of mature years.

The usual popular features of "The Motor Cycle" will be retained.

British Crude Oil.

It is difficult to estimate the true value of the reports concerning the oil boring undertaken by Lord Cowdray at Chesterfield.

Second A.C.U. Committee Meeting in the Provinces.

The directors of Douglas Motors, Ltd., and the Bristol M.C.C. are making arrangements to entertain the A.C.U. Committee when they visit Bristol for the second meeting of the 1919-20 session to be held in the provinces. The meeting will be held at the Grand Hotel, Bristol, on the 20th June, and a number of bedrooms have been reserved for members of the committee. Those members of the committee wishing to reserve a room should communicate with the manager.

For the morning of the 21st, Douglas Motors, Ltd., have invited the committee to view their works, and will provide sidecars to convey the visitors from the hotel. The directors have also invited the committee to take lunch with them that day, and afterwards propose to convey their guests to either Weston-super-Mare or Cheddar Gorge, where an event is being organised by the Bristol M.C.C.

Police and Lighting Regulations.

Exeter police are particularly busy regarding the motor light regulation. The regulation prohibits a car carrying lighted head lamps, the glass of which exceeds 5in. in diameter. A London chauffeur was summoned for an infringement of the regulation, and his solicitor rightly pleaded that the regulation was difficult to understand. A light up to five inches diameter need not be obscured, but if it exceeds that diameter the whole must be darkened. Few people, said the solicitor, knew this, and defendant pleaded ignorance of the regulation. The summons was dismissed on defendant paying the costs.

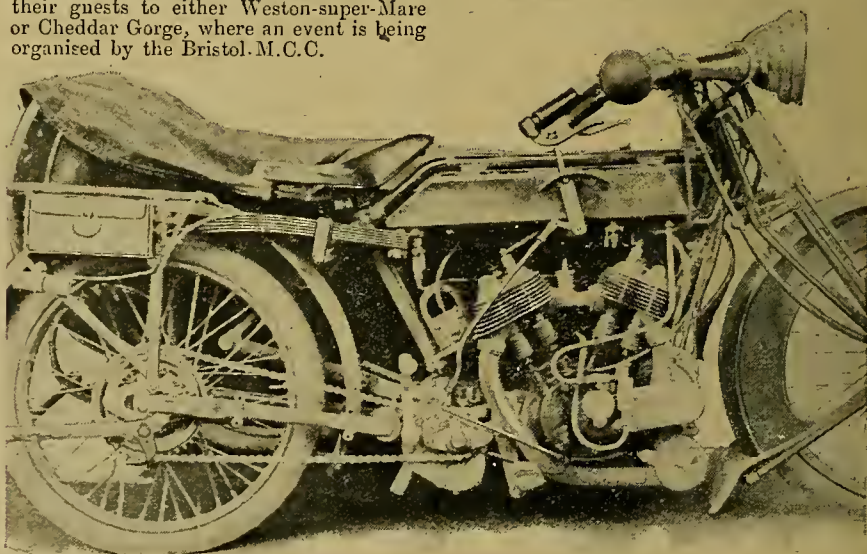
R.A.C. Annual General Meeting.

This meeting was held at the Club House, Pall Mall, on the 29th May, the chairman, the Hon. Sir Arthur Stanley, G.B.E., C.B., presiding.

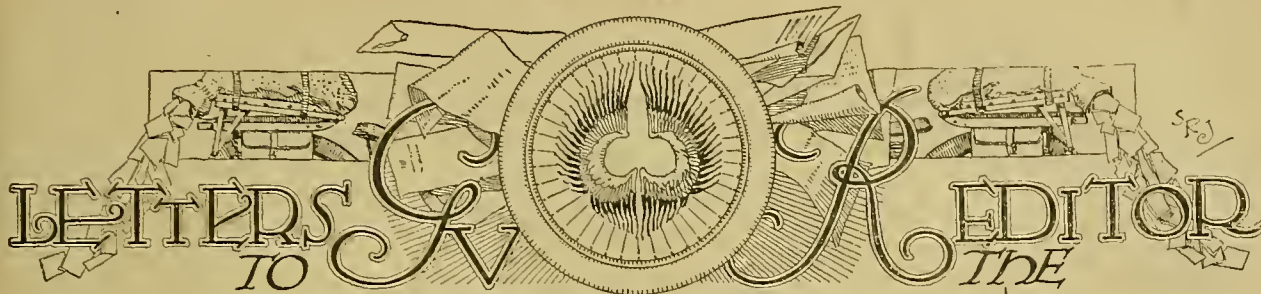
Reviewing the work of the Club during the war, the Chairman stated that there had been a large increase in the membership, and that the Club was in a sound financial position in spite of the difficulties caused by the war. In the first days of the war the Club offered honorary membership to all overseas officers: knowing that it was difficult for an officer from overseas to find accommodation in London, that he would be practically stranded, and probably know nobody, the Club felt that he was a man to whom of all others it should be the first to offer hospitality. 14,000 overseas officers had availed themselves of this privilege, and the committee had had gratifying testimony to the value and appreciation set upon the privilege of honorary membership. That hospitality would continue until all such officers had returned to their homes.

The R.A.C. War Service Department was instituted in order to help the Government at a difficult period. The total mileage accomplished by these voluntary drivers, as far as an estimate could be formed, was over 37,000,000.

Mr. A. F. Bird, M.P., expressed the appreciation and thanks of the Colonial Office for the splendid hospitality extended to overseas officers.



An experimental model 8 h.p. Sunbeam fitted with spring frame. This machine is undergoing strenuous tests at the present time.



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Herford Street, Coventry, and must be accompanied by the writer's name and address.

EASY STARTING.

Sir,—As an A.J.S. rider, I was much interested in "K.O.S.B.'s" letter in *The Motor Cycle* of May 15th. My machine is a 1914 2½ h.p. model, and I have never had the slightest trouble in starting. During the war the machine was idle at one period for over twelve months, and on taking it out it started at the first kick. This was with pre-war spirit, a little of which I had on hand. Again, however, the machine was "laid up," but this time for quite two years, and on trying the engine it started and ran perfectly at the third kick; the spirit used being War Grade 1. Such a performance may seem questionable, but I can absolutely guarantee the truth of my statement. AJ 2394.

South Shields.

Sir,—Several of your contributors have been complaining recently in your columns of difficulty in starting.

I was troubled with this very much until recently with a Morgan Runabout, and then I cured it in the following manner.

I now carry a small piece of muslin about two inches square, and when I flood the carburettor (Binks) I hold the rag underneath the float chamber, and let it absorb the overflow. Then, pushing the petrol-soaked piece of cloth into the air intake, one pull up of the starting handle invariably starts the engine. Then remove the rag.

Hoping this may be of some use to some of your readers, Dungannon. R.A.F. (Pilot).

THE CAPACITY OF TWO-STROKES.

Sir,—Would it not be far more accurate, and also more advantageous to the two-stroke, if the period that the ports are open is excluded from the stroke for the purpose of calculating its capacity? For instance, my Allon has a bore and stroke of 70 x 76 mm. = 292 c.c. Suppose that the ports are open for 6 mm. of the stroke, and calculate the capacity 70 x 70 mm. = 269 c.c. Also put down the nominal horse power from this.

My reasons for suggesting this are: (1.) That this really measures the quantity of mixture that the cylinder can take. (2.) That consequently the power can be more correctly assumed from this.

I should like to know of any objections to this by readers. Ilfracombe. R.E.C.

COURTESY ON THE ROAD.

Sir,—As some of your correspondents have pointed out, many present day motorists lack the *esprit de corps* to help motorists who are delayed by breakdown on the road. For instance, on May 10th, whilst travelling from Bradford to Bolton Abbey I spent an hour in assisting an unlucky rider. But, on the way back, my friend on a Harley-Davidson and sidecar ran into a flood on the road, and we could not do anything, and six miles from home. The Morgan I rode had sooted plugs, and no good spare plugs.

Out of well over one hundred motorists who passed not one stopped to ask if he could assist; and yet the aid of two plugs, which I would have paid anything for, would have got us out of the difficulty. Without them my own machine would hardly move.

Finally, we partially cleaned two plugs, and the Morgan was compelled to pull the Harley-Davidson and sidecar and three people six miles up steep gradients of between 1 in 10 to 1 in 5 up to Heaton. (Anyone who knows this district will realise what this means.) It did it with three stops, and all credit to the makers of the Morgan, but it has done a lot of damage as it is a 1914 machine.

A little "do as you would be done by" would have saved us all this trouble and expense.

I hope you will excuse this from a great admirer of your paper, to whom Thursday is the day of the week.

Bradford.

AH 1707.

ONE-LEGGED RIDERS.

Sir,—I regret to find that your correspondent "Gammy Leg" should have cause to complain at the manner in which manufacturers have treated his application for a machine suitable for a rider with only a right leg.

I have also lost my left leg, but have had no difficulty in finding a suitable machine. The machines I am riding, and will always ride, are the 2½ h.p. and the 4 h.p. Douglas.

This make is most comfortable and free from vibration, and I find it the most suitable machine. I am sure it would suit your correspondent, as the machine can be controlled without the use of the left leg.

I would also say that the Douglas is suitable to the man who has lost his right leg, and if he would take advantage of my experience, which I have previously recorded in these pages, he would have nothing but a Douglas. I have previously suffered considerably in using other engines that were not so vibrationless. E. G. FERY.

THE ARBUTHNOT TROPHY.

Sir,—I note with interest your statement that the rules and regulations for the Arbuthnot trophy event will be announced shortly. The point to which I wish to draw attention is the fact that "the start and finish will be at Plymouth." Though it does not necessarily follow that the whole event will be concentrated round that area, I submit it would be much more convenient for this event to be held in the Midlands, and more or less equidistant, and more get-at-able from all Naval depots and bases, such as Portsmouth, Chatham, Harwich, Rosyth, and even North of that. Probably it is too late now to alter any arrangements already made, but as the majority of the ships in home waters are not at Plymouth it consequently means at least two days more leave being asked for than if it had been held in the Midlands, and may prevent quite a number of would-be competitors from entering. It is not just a question of asking for leave and getting it even these days.

H.M.S. *Commonwealth*. CEDRIC NAYLOR, Lt. R.N.

[The rules and regulations of the Arbuthnot Trophy trial are given elsewhere in this issue.—Ed.]

EMPLOYMENT FOR DESPATCH RIDERS.

Sir,—We have noticed the letter from "L.A.C." in your issue of the 29th ult., and are writing so that he and any other despatch riders who may be in the same boat may take their opportunity.

As our name indicates, this company has been formed by ex-D.R.'s, and our aim is to employ as many ex-D.R.'s as possible.

We have not, unfortunately, been able to get into full swing as yet, and cannot offer employment to more than one or two at the moment, though later we shall hope to do more.

In the meantime we shall be glad to hear from any ex-D.R.'s who may be wanting employment. They should state their qualifications and also their army service, as, in the event of there being more applicants than we can employ, this will be taken into consideration.

THE D.R. ENGINEERING CO., LTD.
R. S. MANSFIELD, Director.

SALES OF ARMY MOTOR CYCLES IN THE PROVINCES.

Sir,—In a recent issue of your journal I was glad to see the article in connection with sales of Army motor cycles in the provinces. It is absolutely unfair to prospective buyers in other large towns to be denied this privilege, and especially men who have done their "bit," on the saddle. I feel sure your many readers outside London would be grateful to *The Motor Cycle* if a change of place for these sales is brought about. J. A. PARTINGTON.

PRICES OF MOTOR CYCLES.

Sir,—In your issue of May 22nd, "Satisfied" is certainly "one of the lucky boys!" My experience during the past few months has been the reverse. I have advertised and answered advertisements, but "na-poo." I am in want of a good combination, not less than 4 h.p. with suitable touring gears, and would have paid a good price, but nothing worth the money asked has crossed my path. Next season perhaps those who have paid such high prices for 1914 and older machines will be glad to sell at half the price they paid this year. Meanwhile, I think I shall not do better than wait until a good reliable single or twin combination is offered at a reasonable price. At the same time I am confident *The Motor Cycle* will be "dead nuts" on any shady deals that are exposed any time.

DISAPPOINTED.

SPARE PARTS.

Sir,—I have read your Correspondence columns with great interest, lately on the subject of obtaining spares, etc.

I was very badly placed through a mechanic fitting, or misfitting, an X-L-All pan-seat on my motor cycle with two springs of different tensions, resulting in smashing up the underwork. I was about to proceed on a tour, and tried every garage in my county, asking it to procure one for me. The great majority told me that they would order, but it would be weeks or even months perhaps before I got delivery.

I thereupon wrote X-L-All Ltd. explaining how I was placed, and they sent me the required part per return complete to the merest detail, and from a very vague description from me. I had not had any previous dealings with this excellent firm, although I have used their saddles for a considerable period, and I may say that they cannot be beaten for use and comfort when riding, especially on very long runs.

I may add that I did not send cash with order either.

In my opinion if the motoring public were to combine together and only patronise firms such as the above, leaving out of the running the firms who do not even reply to one's order, a change would result.

Westbury.

COMFORT SEEKER.

Sir,—I should like to present the other side of the spare part argument. I have a 1913 A.J.S., which required new valve guides. Although out of stock of these old parts the firm in question got them specially cast and machined in a little over a week, and at a reasonable charge. I am not even a shareholder.

MANCHESTER.

GOVERNMENT MOTOR CYCLES FOR EX-OFFICERS.

Sir,—With reference to the enormous numbers of motor cycles which are obsolete or must be sold, as they will not be required, would it not be a good opportunity for the Government to recognise the services of officers, who have been wounded or invalidated out of the Army, by allowing them the option of purchasing a motor cycle for their actual own use at a nominal sum?

A kindly act such as this would be greatly appreciated by numbers of officers who offered their services to their country, and would make them feel that they have not been overlooked in the disposal of the surplus stock.

It should, of course, be a *sine qua non* that, an officer being allowed to purchase a machine at a nominal cost, it should be for his own use only, and that he should not be allowed to part with the said machine without the consent of the War Office having first been obtained.

In hundreds of cases an arrangement of this kind would be an immense boon to officers who could not afford to purchase motor cycles in the open market, and it would provide them with a form of recreation which they could not obtain, except in rare cases, were they obliged to purchase machines through the ordinary business channels.

A concession such as this on the part of the War Office would be highly appreciated, and would be a further opportunity for it to recognise the services of young officers.

C. FITZGERALD A. BIRD.

GRADIENT WANTED.

Sir,—I would like to know the gradient of a hill in North Wales, which is situated about four miles from Mold and runs off the main road between Mold and Ruthin. The hill in question is on a byroad from Llanferres to Maes Hafn, and, I believe, has been used as a test hill by some of the Liverpool clubs.

H. MIDDLETON JONES.

Heswall.

FOUR-STROKE V. TWO-STROKE.

Sir,—As regards lightweights, I think the four-stroke type beats the two-stroke type every time. Let us compare the advantages and disadvantages of both types.

	Four-stroke.	Two-stroke.
Maximum speed ...	45-50 m.p.h.	35-40 m.p.h.
Reliability	Reliable.	Reliable.
Fuel consumption...	100-120 m.p.g.	80-110 m.p.g.
Oil consumption ...	Good.	Bad.
Simplicity	Not very simple.	Very simple.
Carbon deposit	Decarbonise once every 2,000 miles.	Decarbonise every 600 miles.
Starting	Easy to start.	Easy to start.
Overheating	Does not overheat easily.	Overheats very easily.
Hill-climbing	Good.	Very good.

Also, the average two-stroke's consumption of plugs is absolutely abnormal. If you drive over 25 m.p.h. for any length of time the average two-stroke machine will show distinct symptoms of "tiredness," whereas I have driven a 2½ h.p. J.A.P.-engined lightweight for nine miles at an average of 31 m.p.h. without showing any signs of overheating.

As far as I can see, the only advantages the two-stroke has are: (1) Simplicity; (2) good hill-climbing; and (3) cheapness. As regards cheapness, I think the average man would pay an extra £5 for a four-stroke.

R.N.



This narrow, rutty, and stony by-lane, with a gradient of 1 in 6 or so, is a sample of the "going" selected by trials committees in their endeavour to eliminate a number of riders. The modern machine, however, is seldom balked by gradients alone, but loose stones or mud on hills of 1 in 3 or less certainly do call for good driving.

A LIGHTWEIGHT T.T.

Sir,—We are pleased to see that you are taking up the question of a lightweight T.T., and notice you suggest a c.c. of 200 to 225. In our opinion it would be advisable to increase this to 275 c.c., as our experience proves that engines of very small capacity, after running a year or two, fall off in power to such an extent that the average owner becomes disgusted with it, for he does not properly understand that it is due to wear, and can be put in order by a little expert attention.

In addition, we would like to see some means taken, particularly with the two-stroke, to safeguard excessive petrol consumption, for, as you are no doubt aware, extraordinary power can be obtained from the two-stroke, but the petrol consumption is generally heavy, and would be entirely misleading to the public if some means were not taken to check this.

VELOCE, LTD.,

J. GOODMAN, Managing Director.

[We commend these suggestions to the notice of the Antio Cycle Union.—Ed.]

INFORMATION WANTED.

Sir,—Within the next few weeks I shall proceed to Basra on business, and desire to take with me my motor cycle, a 1914 Triumph (an old and trusted friend) fitted with Sturmey-Archer three speed hub. Would any of your readers, ex-D.R.'s in Mesopotamia, be good enough to give me the following information either direct or through your correspondence pages (in which latter case the information would, no doubt, be of general interest). (1.) Does the dust and sand in any way injuriously affect the engine, gear, or wheel bearings, and should any special precautions (such as fitting gauzes in the induction pipe) be taken? (2.) How does the summer heat affect the tyres? (3.) Are there any roads in the Basra-Bagdad district fit for riding on? (4.) Generally, whether it is desirable to take a motor cycle to such a climate and, if so, should any special steps be taken in order to keep it in good order and prevent undue deterioration?

R. A. GUTHRIE.

MOTOR CYCLES FOR THE DISABLED.

Sir,—After reading in *The Motor Cycle* "Motor Cycles for Disabled Men," I thought my own case might interest some of your readers. I was wounded rather severely in the left arm; but, strangely, the arm has grown quite strong, and has left the hand partly paralysed, so that it is impossible for me to get a grip. Under these circumstances it seemed as if I should have to give up motoring, but I "chanced my arm" with an Ivy two-stroke with fixed ignition and gear. I had to change the decompressor lever to the right handle-bar, and, to prevent my right hand slipping off the handle, I made a stiff leather gauntlet lined with camel fleece and fitted with a wind cuff. The elastic in the cuff of the gauntlet gripped my left wrist and held my hand in position. Thus, I was enabled to steer quite easily and comfortably with the damaged arm, and, when necessary, it was quite safe to take my right hand from the handle-bar for any purpose. Since my first experiment was successful I have grown bolder, and now ride a new model New Imperial with kick-starter, two-speed, and clutch. I converted the hand-controlled clutch into foot-controlled, and placed the lever on the right foot-board. Then I changed over the exhaust valve lifter to the right, and now all controls are operated by the right hand. With the aid of my priceless leather cone I can ride as easily and safely as if I had the full use of both hands.

In a few weeks I shall require some practical advice, as I have on order a new A.B.C., and that will have to undergo the same treatment as regards alterations to clutch and exhaust valve lifter, unless, of course, this catches Mr. Bradshaw's eye, and he can make the necessary alterations for me before I take delivery.

ONE PIP—YORKSHIRE.

Sir,—I noticed a letter in your issue of the 3rd inst. with reference to motor cycling with one leg. I regret not having been able to give my views earlier, but think my experience might be of use to many riders with one leg. Personally, I have lost my left leg above the knee (middle third). I had a $2\frac{3}{4}$ h.p. A.J.S. at the time, and rode it several times after having my leg off, but before I had much confidence, and decided it was too heavy and high. I then obtained a $2\frac{3}{4}$ h.p. James two-stroke with 24in. wheels, on which I covered thousands of miles, and climbed many long and steep hills, including Red Bank, near Grasmere.

I think for anyone starting to motor cycle with one leg it would be very inadvisable to try and ride solo a heavy machine such as the ones mentioned by your correspondent, who may possibly be very long in the leg, abnormally strong, or only have his leg off below the knee.

Another point I would mention is that with certain machines and types of handle-bars the latter are apt to catch the wooden leg when turning to the side of the wooden leg, and consequently throw one off.

With regard to the side for the brake, this is not very important, as it can easily be changed over. I have not had Bowden handle-bar controls fitted to rear brake, and do not personally consider it necessary.

The Baby Triumph, Enfield two-stroke, and Clyno two-stroke are all suitable machines, also the $2\frac{3}{4}$ h.p. Douglas. I never had any difficulty in starting by paddling off, provided I put a rag in the air inlet in cold weather and cleaned the dirt out of the carburetter occasionally.

Hulme.

N.O.O.E.

A.C.U. SIX DAYS TRIAL.

Sir,—I take the liberty of making the following suggestions for consideration by the A.C.U. Competitions Committee when the rules and regulations for the Six Days Trial are being compiled.

(1.) That two trials be held—(a) one for solo machines and (b) one for sidecar and passenger machines.

(2.) That all machines be ridden by amateurs.

(3.) That a reasonable allowance of petrol be made for each day's journey. The petrol to be obtained at certain points only, and the tanks sealed. Any machine failing to complete the journey on the allotted amount to fall out of the competition.

(4.) That, if it could be arranged, tyre trouble should not disqualify, provided in other respects the machine performed satisfactorily.

(5.) That a system of marking be adopted which should take into consideration the total weight of the cycle or outfit, plus passenger or passengers.

(6.) That cleanliness be given a prominent position as regards marks.

(7.) That a minimum low gear ratio be established.

Suggestions 1 and 2 would prevent the trial from becoming too unwieldy as regards numbers.

In addition, No. 2 would show the performance of machines in the hands of the ordinary riding public.

If desirable, a trade trial could also be held.

As regards No. 3, it could be arranged that a distance of 100 miles had to be traversed before additional petrol could be obtained. This would enforce the fitting of tanks of a sensible size.

It is obviously unfair that a machine should be penalised merely because a nail is picked up on the road. This is a case of luck, not mechanical weakness. Hence No. 4.

No. 5 protects the standard touring outfit. The same applies to No. 6.

No. 7 prevents a machine with freak gears from scoring over the machine fitted with the ordinary type gear box.

C. J. LEATHERBARROW.

MAPS FOR MOTOR CYCLISTS

"THE MOTOR CYCLE" ROAD MAPS.	Price.	Post free.
1. England & Wales. 2. Scotland. 3. London, (Showing roads into and out of London and avoiding London.) Set of three, complete in case	4/6	4/10
"The Autocar" Map of England and Wales. Dissected and folded in neat case cloth	12/6	13/-
Also on rollers (a good wall map)	12/6	13/-
"The Autocar" Map of Scotland		
"The Autocar" Map of Ireland.		
Same styles and prices as above.		
"The Autocar" Sectional Map of England and Wales, Consisting of 24 loose sections on strong card, in stout waterproof envelope .. (complete)	5/-	5/6
In leather case, transparent front	15/-	15/6
"The Autocar" Half Inch Map of England and Wales. In 37 sections. Each section	3/-	3/2
"The Autocar" Map of South Eastern England.		
In stout waterproof envelope	3/6	3/10
In leather case, transparent front	15/-	15/6

Obtainable by post (remittance with order) from
ILIFFE & SONS Ltd., 20, Tudor Street, London, E.C.4.
or of leading Booksellers and Railway Bookstalls.

A SIMPLE TAIL LAMP.

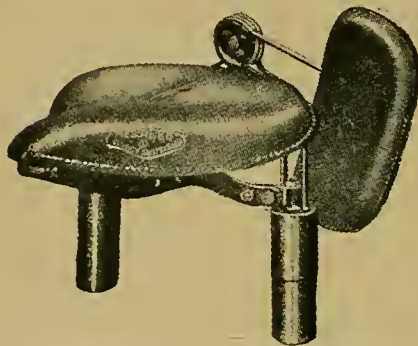
A TAIL lamp of simple design has lately been placed on the market by James Grose, Ltd., Old Jewry, London, E.C.2. The little lamp is symmetrical in appearance, and quite well finished. It is lit by applying the flame of a match to a couple of holes underneath the burner, so that the front need not be opened.



A tail lamp of a clean design.

SADDLE COMFORT.

ALTHOUGH quite a number of motor cyclists use back rests on their saddles, probably more would use them if arranged so that they could be



A "swing down" back rest of American design.

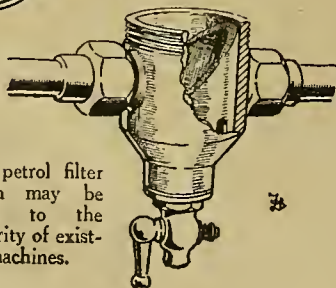
swung down conveniently for mounting. Such a back rest has recently been introduced by an American firm, and, as will be seen from the accompanying illustration, is quite simple in principle.

A NEAT PETROL FILTER.

MOTOR cyclists who have suffered from water and other impurities in war petrol will be interested in the simple little filter which is to be marketed by Messrs. Rotherham and Sons, Ltd., of Spon Street, Coventry. The body is a simple bronze casting, having an inlet orifice on one side and an outlet directly



A petrol filter which may be fitted to the majority of existing machines.



opposite. The filter gauze is attached to a short length of tube, which is held in position by a peg and is bevelled off from top to bottom so as to expose the largest possible gauze surface to the flow of petrol. A sump is formed in the body casting, directly below the gauze, and "sludge" may be drained from this either by a tap or plug. The gauze and its tubular mounting are held in position by a screw-on cap, and the complete filter is very small and neat.

THE LICOPHOTE INSPECTION LAMP.

ONE of the handiest and most ingenious inspection lamps we have yet had the pleasure of seeing is known as the "Licophote," sold by the Engineering Accessories Company, 2, Army and Navy Mansions, 115, Victoria Street, Westminster, London, S.W.1.

It consists of a small pocket flash lamp battery of good quality in a khaki twill case, held by a simple wire frame. On the top is a small box, at one end of which is a spare bulb in contact with the terminals of the battery and covered with a red celluloid disc. At the other end is a detachable plug, with an ample length of flexible wire leading to the inspection lamp, and also a switch for switching on the rear light.

In the twill case there is a pocket for a spare red disc. The battery frame is provided with a projection so that the battery can be hung inside the pocket or on the motor cyclist's belt. In this position the inspection lamp may be conveniently used, and in the event of there being necessity to do any serious work at night the inspection lamp is dropped down the sleeve and held by means of a wire clip, which can be slid up or down the flex so as to adjust the length of wire to suit the size of sleeve. In this position the lamp is securely held on the sleeve and shines on the work while the adjustment is made, leaving both hands free.

The spare-bulb holder can be removed and the bulb detached by pressing the two springs which hold the red disc in place. The red disc comes away and the bulb may be lifted from the clip which holds it.

The idea is that, in the event of a motor cyclist being suddenly overtaken by darkness, with both lamps out of order, he can hold the inspection lamp in his hand and use it as a head light, hook the battery on to his pocket, and shine the red light to the rear, thus covering two or three miles still conforming to the law.

The whole device is beautifully made and well finished, and should undoubtedly appeal to motor cyclists, especially those who are entering for the London-Edinburgh run. The inspection lamp may be switched on or off by twisting the metal part of the bulb holder.

TRIPLEX GLASS GOGGLES.

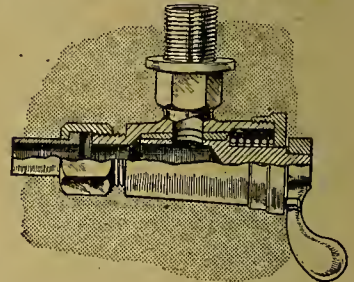


Triplex safety glass goggles returned from France by an officer who reports that he fell from a great height, but his eyes were not hurt owing to the fact that he was wearing Triplex unsplinterable goggles.

AN IMPROVED COMPRESSION TAP.

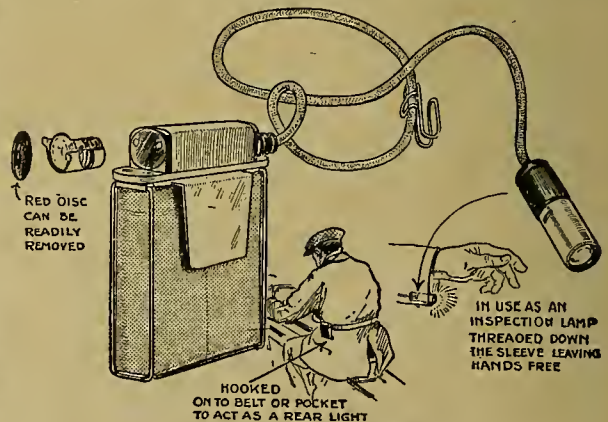
AN effort to improve upon the existing form of compression tap has been made by Capt. Lubbock, of the Sittie Valve and Engineering Co., 60, Chancery Lane, London, W.C.2.

In the left-hand drawing, Capt. Lubbock has attempted to show the source of leakage in the existing form of compression tap. From the drawing of his improved device, it will be seen that the



The usual type of compression tap, showing where leakage frequently takes place, and a needle type designed by Capt. Lubbock.

tap is of the needle valve variety, and screws down on to a ground tapered seating, while there is a lever for locking the stem, so that leakage is impossible. The lid covering the cup has a series of holes drilled in it, through which petrol may be injected, and its centre serves as a bearing for the valve stem.



The Licophote inspection lamp.

IMMEDIATE DELIVERY of the famous C.A.V. Magneto

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NOW GUARANTEED

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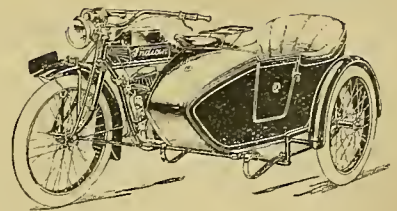
Telegrams: "Hendian, Eusroad, London."

AUSTRALIA—109-113, Russell Street, Melbourne.

AFRICA—Indian House, 127-9, Commissioner Street,

Johannesburg. Indian House, 579, West Street,

Durban. Indian House, Strand Street, Port Elizabeth.



SUNBEAM MOTOR CYCLES

WITH PERFECT POWER TRANSMISSION.

Three 3½ h.p. Sunbeams with Sidecars were entered in the Birmingham M.C.C. Easter Trial and won Three Gold Medals.

This fact speaks volumes for the power of the Sunbeam Engine and the perfection of the Sunbeam Transmission.

3½ h.p. . . . 95 guineas.

8 h.p. . . . 120 „

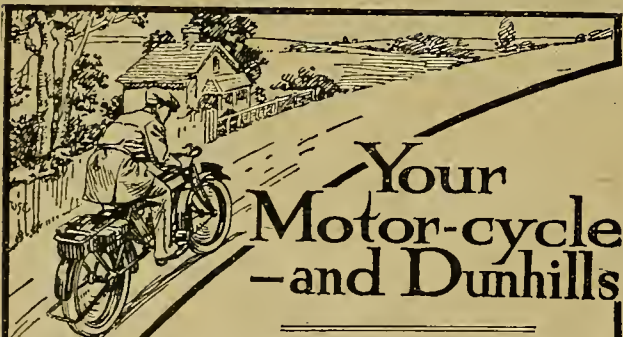
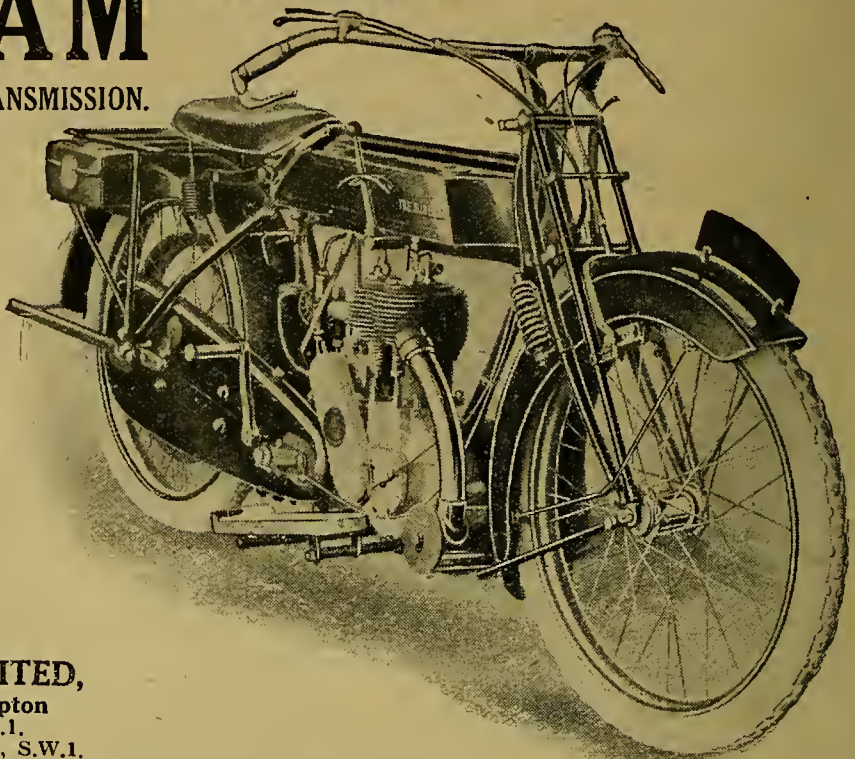
No. 1 Sidecar

for 3½ h.p. . . 30 „

No. 2 Sidecar

for 8 h.p. . . 38 „

JOHN MARSTON, LIMITED,
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Goggles, Lamps
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It is all very well to picture that whirl through the countryside as one long spell of unbroken pleasure, but it is more practical to reflect on the possibilities of mishap and to anticipate the troubles that may arise. It is still more practical to arm yourself with all those "Motorities" which add to the joy and enable you to deal promptly and effectively with "troubles." It is not good to find yourself in difficulty just as the shades of night are falling and you at a spot "miles from anywhere." Be a "road-wise" motorist and equip yourself fully and efficiently at Dunhills.

Drop us a card as to what you require, and we will send you particulars and quotations.

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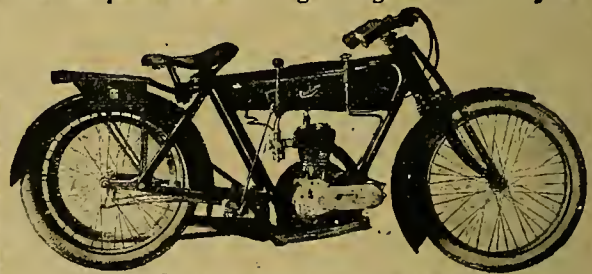
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Fitted with the Blackburne 2½ h.p. Engine.
The Super-excellent Lightweight Motor Cycle.



NOTE THE SPRING FRAME.
Brief Specification.

Engine, 2½ h.p. Blackburne.
Ignition, M.L. Magneto.
Gear, Two-speed Albion.
Transmission, Chain cum Belt.
Wheels, 26 x 2½.
Handle-bars, Wide T.T.
Springing, Rear pivoted arm.
Leaf spring. Only one working point.

PRESENT PRICE

60 Guineas

We are prepared to appoint agents where not already fixed for South Lancashire and North Cheshire.

Book your order now for early delivery of Coulson-B, Brough, Henderson, American Excelsior, B.S.A., A.B.C., J.E.S. Motor Cyclettes, and Chater-Lea 2-stroke Motor Cycles. Write for full particulars to

J. BLAKE & CO.,

22, Rodney Street,

Liverpool.



Sheffield and Hallamshire M.C.C.

The trial for the Dickenson and Darwen cup, held at the end of last month, will probably result in a tie between F. Dover (4 h.p. Douglas sc.) and H. Reynolds (4½ h.p. B.S.A. sc.).

Redditch and District M.C.C.

The results of the speed-judging competition are as follows: 1. W. Hillman (4¼ B.S.A. sc.), no error; 2. H. Herbert (4¼ B.S.A. sc.), 13s. fast; 3. R. Nicholls, jun. (4¼ B.S.A. sc.), 25s. slow.

N.M.C.F.U. (Wolverhampton).

The reorganised Wolverhampton branch of the N.M.C.F.U. promises to be a success, and the recent opening run to Wellington was well attended. Several members attempted to climb the Wrekin, and the riders of a 3½ h.p. Sunbeam, 7-9 h.p. Indian, and 3½ h.p. James succeeded. Mr. George Stevens (6 h.p. A.J.S.) made a sensational climb.

Western M.C.C. (Glasgow).

The opening run of the club took place under ideal weather conditions on May 25th, the destination being Rowardennan, Loch Lomond. Upwards of thirty partook of an excellent lunch provided at the hotel there, and an enjoyable hour was spent in enjoyment of the sunshine and beautiful surroundings. The hon. secretary is Mr. J. Robinson, 250, Great Western Road, Glasgow.

Blaenavon M.C.C.

Great interest was shown in the recent hill-climb on the hill between Govilon and Blaenavon which includes the noted Fiddler's Elbow. This was the first competition held by this newly formed club and proved a great success, the climb being witnessed by about 500 spectators. The results were as follows:

LIGHTWEIGHTS (up to 3 h.p.).—E. Howells (2¾ Calthorpe-Jap).
SOLO CLASS (3½ to 4¼ h.p.).—A. Williams (4¼ B.S.A.).
SIDECARS (3½ to 4¼ h.p.).—D. Williams (4¼ James).
SIDECARS (6 h.p. and over).—H. Howells (6 Enfield).

Worcester and District M.C.C.

A meeting was held at the Grandstand Hotel, Worcester, on Friday last, when it was unanimously decided to form the above club. There was a good attendance, and about twenty members were enrolled. It was resolved to hold a general meeting later on to elect officials, etc. The opening run was arranged for Sunday, June 15th, to Stratford-on-Avon, starting from the Grandstand Hotel at 2.30 p.m. prompt. All intending members and friends are especially asked to communicate with C. E. Tysoe, 38, Droitwich Road, Worcester (temp. hon. sec.).

Future Events.

June 6.—Essex Motor Club. Midnight Ride to Yarmouth.

JUNE 6.—M.C.C. LONDON-EDINBURGH RUN.

JUNE 7.—Blaenavon M.C.C. Run to Llangorse Lake.

JUNE 7.—BRISTOL M.C.C. RELIABILITY TRIAL.

June 7.—S. Birmingham M.C.C. Run to Haselor.

June 7.—Finsbury Park C. and M.C. Run to St. Neots.

June 7.—Woolwich, Plumstead, and District M.C. Run to Green Street Green.

JUNE 7-9.—BIRMINGHAM M.C.C. TRIAL TO LANDS END.

June 8.—N.M.C.F.U., Leeds. Run to Whitby.

June 8.—N.M.C.F.U., Portsmouth. Picnic Run to New Forest.

June 8.—Woolwich, Plumstead, and District M.C. Run to Charing.

JUNE 9.—CORK AND DISTRICT M.C.C. TWENTY-FOUR HOUR RELIABILITY TRIAL.

JUNE 9.—LIVERPOOL M.C. OPEN RELIABILITY TRIAL.

June 9.—Manchester M.C. Gymkhana.

June 11.—M.C.U. of Ireland, Ulster Centre. Speed Trials at Magilligan.

June 11.—Sheffield and Hallamshire M.C.C. Run to Cowdale.

JUNE 11.—WESTERN M.C.C. (GLASGOW). OPEN HILL-CLIMB.

June 11.—Wolverhampton M.C.C. Run to Wellington Wrekin.

JUNE 11.—YEovil AND DISTRICT M.C.C. RELIABILITY TRIAL.

June 15.—Essex M.C. Run to Southend.

June 15.—Middlesbrough and District M.C.C. Picnic on Whitby Moors.

June 15.—N.M.C.F.U., Birmingham and Coventry Branches. Joint Hill-climb at Broadway.

June 15.—N.M.C.F.U., Leeds. Run to Doncaster.

June 15.—N.M.C.F.U., Portsmouth. Picnic Run to Wagoner's Wells.

June 15.—North Derbyshire M.C.C. Run to Ashbourne.

June 15.—S. Birmingham M.C.C. Run to Knightwick.

June 15.—Worcester and District M.C.C. Opening Run to Stratford-on-Avon.

June 15.—Yeovil and District M.C.C. Run to Longleat.

JUNE 18.—MIDDLESBROUGH AND DISTRICT M.C.C. RELIABILITY TRIAL FOR CRADY CUP.

June 18.—Yeovil and District M.C.C. "Treasure Hunt."

JUNE 20.—A.C.U. COMMITTEE MEETING AT BRISTOL.

JUNE 21.—JUNIOR CAR CLUB. HILL-CLIMB AT SOUTH HARTING.

JUNE 21.—MIDDLESBROUGH AND DISTRICT M.C.C. SPEED JUDGING COMPETITION.

JUNE 26.—YEovil AND DISTRICT M.C.C. AND TAUNTON M.C.C. INTER-CLUB HILL-CLIMB.

JUNE 28.—BIRMINGHAM M.C.C. SPEED TRIALS.

JUNE 28.—LIVERPOOL M.C. TWENTY-FOUR HOUR TRIAL TO EDINBURGH.

JUNE 28.—M.C.U. OF IRELAND, ULSTER CENTRE. RELIABILITY RUN.

JUNE 28.—MIDLAND C. AND A.C. RELIABILITY TRIAL.

JULY 4 AND 5.—ARBUTHNOT TROPHY TWO DAYS TRIAL, PLYMOUTH DISTRICT.

JULY 5.—M.C.C. Hill-climb.

JULY 6.—OLDHAM AND DISTRICT M.C. RELIABILITY TRIAL.

JULY 12.—LIVERPOOL M.C. RACES AT COLWYN BAY.

JULY 12.—WOLVERHAMPTON M.C.C. OPEN TRIAL.

JULY 14-15.—M.C.U. OF IRELAND, ULSTER CENTRE. IRISH END-TO-END RELIABILITY RUN.

JULY 16.—ESSEX MOTOR CLUB. SPEED TRIALS AT SOUTHEND.

JULY 16.—BIRMINGHAM M.C.C. MIDLAND CUP TRIAL.

JULY 16.—MIDDLESBROUGH AND DISTRICT M.C.C. 200 MILES RELIABILITY TRIAL FOR GJERS AND NEW HUDSON CUPS.

AUG. 16.—S.E. COUNTIES INTER-TEAM TRIAL.

SEPT. 5.—M.C.C. TEAM TRIAL FOR "THE MOTOR CYCLE" CUP.

SEPT. 15-20.—A.C.U. SIX DAYS RELIABILITY TRIALS.

Birmingham M.C.C.

The Birmingham M.C.C. social run (vice-captain's day) was to Warwick via Kenilworth. The vice-captain, Mr. T. Silver, to give further interest to the run, organised boat races on the river at Warwick, for which twenty-four entries were received.

Rochester, Chatham and District M.C.

The run for the 8th inst. is to Herne Bay, and on Whit-Monday to Battle. On the 29th inst. there will be an inter-club meet with the Streatham and District M.C.C. and Woolwich, Plumstead, and District M.C.C., in order to go over the course for the intended team trial for the Matchless cup. The Rochester club has arranged to enter a team of six, and those wishing to compete should send their names to the hon. sec., Mr. S. White, 3, South Avenue, Rochester.

An Open Scottish Hill-climb.

To be held under the open competition rules of the Scottish Auto Cycle Union, the Western M.C.C., Glasgow, is organising an open hill-climb on the 14th inst., in which there will be five classes. These classes are as follows: (1.) Motor cycles under 350 c.c. (2.) Motor cycles over 350 c.c. and under 600 c.c. (3.) Motor cycles exceeding 600 c.c. (4.) Sidecars under 600 c.c. (5.) Sidecars exceeding 600 c.c. A prize will be awarded to the winner in each class on the following

formula, $\frac{\text{weight}}{\text{capacity} \times \text{time}}$, provided six

entries are received for each class. The trials hon. secretary is Mr. E. Napier White, Sunnybank, Campsie Road, Hillpark, Glasgow.

Edinburgh and District M.C.

The first open one-day trial of the Edinburgh and District M.C., held at the end of last month included a course of 170 miles. There was a large entry, but only thirteen competitors qualified for awards. These were:

Fred J. Hutchison (8 Matchless sc.)
 D. Balloch (6 Enfield sc.)
 G. Crinton (4¼ B.S.A.)
 A. J. C. Lindsay (6 A.J.S. sc.)
 W. H. S. Miller (3½ P. and M.)
 W. H. Anderson (4 Triumph)
 J. R. Alexander (8 Enfield sc.)
 R. S. Macrae (7 Harley-Davidson sc.)
 C. B. Burney (3½ Blackburne)
 A. L. Downie (2¾ A.J.S.)
 N. W. Downie (2¾ A.J.S.)
 D. Bell (6 A.J.S. sc.)
 D. S. Alexander (8 Enfield sc.)
 T. A. McCreadie (8 Sunbeam)

The club has decided to hold several very interesting trials in the near future, and the first of these will probably be on the 14th inst. Details of this trial can be obtained from Mr. J. W. Anderson, 6, Castle Terrace, Edinburgh.

Essex M.C.

It has unfortunately been found necessary to postpone the Southend speed trials, which were provisionally fixed for the 25th inst., and, subject to the approval of the Corporation of Southend-on-Sea, they will be held on July 16th, on the Western Esplanade, Westcliff-on-Sea.

Entry forms, etc., will be posted at the end of the present week to those who have applied for them. Full particulars may be obtained upon application to the hon. organising secretary, Mr. Harold Fuller, 51, Pulteney Road, South Woodford, Essex, E.18.

Glasgow M.C.C.

The results of the hill-climb on Rest and be Thankful are as follows:

CLASS 2, not exceeding 600 c.c. (formula).

1. W. Deans (3½ Ariel).
2. Capt. Walker (3½ Triumph).

Fastest time, Walker (3½ Triumph).

CLASS 3, exceeding 600 c.c. (formula).

1. D. Brash (7 Harley-Davidson).
2. A. Brash (7 Harley-Davidson).
3. D. S. Alexander (8 Enfield).

Fastest time, T. Brash (7 Harley-Davidson), formula.

CLASS 4, sidecars not exceeding 600 c.c.

1. W. Deans (3½ Ariel s.c.).
2. H. W. Ballardie (A.J.S. s.c.).
3. N. Fraser (Sunbeam s.c.).

CLASS 5, sidecars exceeding 600 c.c.

1. — Barclay (A.J.S. s.c.).
2. — Wright (5 Indian s.c.).
3. — Baddeley (A.J.S. s.c.).

Fastest time, A. Brash (7 Harley-Davidson).

Bristol M.C.C.

A special general meeting was held on Thursday, the 22nd ult., when there was a large attendance. Twenty-six new members were elected. Mr. J. King was elected vice-captain. The secretary reported that the entries for the Whitsuntide club trial are coming in splendidly; entries close to-day.

The speed trials (open) at Weston-super-Mare are fixed for Saturday, the 21st inst.

Coventry and Warwickshire M.C.

The winner of the Manville Trophy, for the second time in succession, is S. Crawley (4 Triumph sc.), whose error in time at the secret check, which had to be used to decide the winner, was eleven seconds.

The special prizes were awarded:

CLASS I. (Solo).—G. L. White (4 Triumph).

CLASS II. (Sidecar).—A. R. Grindlay (8 Harley-Davidson s.c.).

CLASS III. (Cars).—S. Wright (10 Humber).

It has been decided to hold a trial on the first or second Saturday in July in order to test the brakes and clutches of the machines and the skill of the drivers. The trial will be held on a circular course, not exceeding ten miles

in circumference, and will embrace several stiff hills, of which, both on the upward and downward journeys, there will be stopping and starting tests on each round.

In all probability the team which will be selected to represent the Coventry and Warwickshire Club in the M.C.C. team trials, to be held in September, will be picked as the result of this trial.

Exeter M.C. and Junior Car Club.

Exeter Motor Cycling Club has been revived and there is every prospect of a successful season. The name of the club has been altered to the Exeter Motor Cycling and Junior Car Club, this being with a view to bring into membership owners of light cars. At the opening run on the 24th ult., there was a good attendance.

Oldham and District M.C.

Practically ninety-eight per cent. of the competitors in the Oldham and District M.C. trial made a non-stop run. The ideal conditions were responsible for this, as the course would have been a difficult one had the weather been wet. The majority of the competitors were ahead of time at the secret check. The following are the results: T. Leach (4 Bradbury), loss of eight marks; F. Wilson (4 Triumph sc.), loss of eleven marks; H. Holt (6 Bradbury sc.), loss of twelve marks.

FAST AND SLOW HILL-CLIMB.

Northampton Club holds Interesting Event on Doddington Hill.

OVER a hundred spectators witnessed the Northamptonshire M.C.C. hill-climb last Thursday, when standard touring machines were made to climb Doddington Hill at their highest and lowest speeds on top gear.

The hill was 550 yards long with a gradient of 1 in 6, and each competitor had to make a standing start, returning to the bottom of the hill after his fast ascent and then making a second top gear climb in the "slow" test, the difference between the two times deciding the results.

It was originally intended to divide the entries into three classes, but finally only the heavyweight and 500 c.c. solo classes were adopted, as the sidecar class arranged did not attract sufficient entries to make a competition, but J. J. B. Croall (7 Harley-Davidson sc.) made an exhibition climb, covering the distance in exactly 30 secs.

The greatest speed on the hill was attained by G. M. Sharpe on a 3½ Norton, but his time, owing to a bad start, was 32½ secs. The various competitors' times are given:

HEAVYWEIGHT CLASS.

	Fast Climb.	Slow Climb.
	s.	m. s.
H. J. Bagsley, senr. (6 Rex)	30	.. 1 56
J. Bagsley, junr. (6 Rex)	33½	.. 1 51

500 C.C. CLASS.

J. B. Sneath (3½ Sunbeam)	37	.. 1 52
F. Grose (3½ Indian)	40½	.. 1 30
J. Paradise (3½ Norton)	31½	.. 1 45½
F. Jones (3½ Triumph)	36½	.. 2 0
M. Sharpe (3½ Norton)	32½	.. Failed.
R. Douglas (3½ Triumph)	41½	.. 1 48
J. Lucas (3½ Triumph)	50	.. Failed.
B. Dawson [ss. allow'ce] (2½ Douglas) ..	49½	.. "
J. Brown [ros. allow'ce] (2½ Campion) ..	63½	.. "



H. J. Bagsley, at the Northants M.C. hill-climb, winning the speed climb in the heavyweight class on a 6 h.p. Rex.

Finding a Winner by Efficiency Tests.

S. Birmingham Club holds Eighty Mile Trial with Stopping, Restarting, and Brake Test.

WITH the idea of eliminating the necessity of resorting to speed judging and secret checks as a means of finding winners of the Allday Cup and Joyce Shield, the S. Birmingham M.C.C. introduced tests for the competitors which had some bearing upon reliability and efficiency of their machines. A secret check was taken, however, in case of a tie. The features of the trial included a stopping and restarting test on Sunrising, a brake test on Edge, a surprise hill, and a water splash, and the exacting nature of the trial may be judged by the fact that only two competitors lost no marks.

Twenty-six entrants started, of which many were Allon two-strokes and Triumph solo and sidecars. The James, B.S.A., Norton, Clyno, A.J.S., Douglas, and Harley-Davidson were represented by one machine each.

Mr. E. Roberts, the organiser of the trial, evidently believes in the surprise element, and one must admit that a stop and restart on a hill are usually required when least expected. With this in mind, the spot selected for the stopping and restarting test was immediately round the S bend at a place where motor cyclists intent upon climbing the hill would be travelling fairly fast.

It was clear that few of the competitors properly understood what was demanded of them, and to this was due a large number of lightweight failures.

Such a test was comparatively easy for the larger powered machines, E. Boydell (6 A.J.S. sc.), H. Blumfield (6-7 Abingdon sc.), P. Cutler (4 Norton sc.), T. Stevens (4½ James sc.), H. J. Uzzels (4½ B.S.A. sc.), and T. Hufton (6 Clyno sc.), making the stop and restart in splendid style. S. Upton (7 Harley-Davidson) came round the bend too fast and, in pulling up inside the tapes, un-



Sidecars being timed away at Didsbury in the reliability trial held last Saturday by the Manchester Motor Club.

fortunately stopped his engine, and having to keep one foot on the brake to prevent the machine running backwards, could not restart the engine without assistance.

All the Triumphs, in the hands of A. W. Thrush, H. Walton, G. Dalby, — Hunting-ton, A. Gill, F. Stretton-Ward, and S. C. Lambert, did well, as did L. Newey on an Ariel sc.

From Sunrising the competitors were taken down Tysoe Hill, up Broom Hill, through Compton Wyniaties, and up Tysoe to Edge.

The brake test on Edge revealed that fully half the competitors had not read the rules thoroughly. 73½ yards were measured down the hill, which distance the competitors were required to cover in fifteen seconds (10 m.p.h.); at the end of this distance a marshal signalled for the competitors to stop, the distance allowed being three yards.

Very few succeeded in stopping in this distance, but it is probably true that all could have done so had they considered the matter properly.

Most of the competitors came down too fast, and did not apply the brake until they were actually on the first tape marking the three yards, with the result that they skidded a fair distance; the majority did not pull up under twenty to thirty feet outside the nine feet allowed. Upton (7 h.p. Harley-Davidson) proceeded for seventy or eighty feet with his rear wheel locked.

T. Stevens (James) stopped with his front wheel one foot over the line. G. Dalby (Triumph sc.) was one of the few to stop inside the tapes, while Newey (Ariel sc.) skidded right round inside the marks.

The test was very instructive, but also destructive to tyres.

After leaving Edge Hill the competitors had an easy run on main roads to Bearley Cross, after which place they had several miles of narrow lanes, with a surprise hill, unmarked on the route card, and a ford.

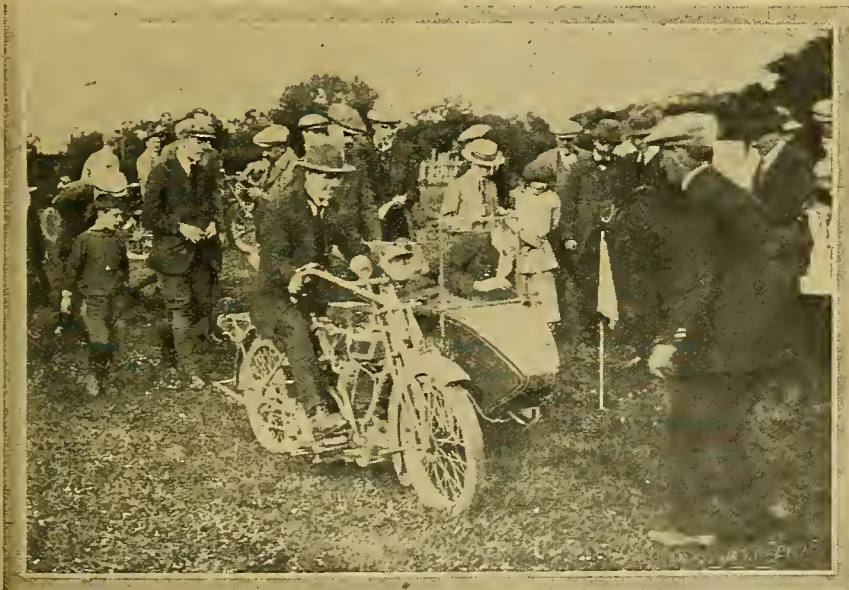
The results are as follow:

CLASS I.—MACHINES ABOVE 300 C.C.

1. L. Newey (3½ Ariel sidecar) No marks lost.
2. G. Dalby (4 Triumph)
3. T. Stevens (4½ James sidecar) ... Lost 2 marks.

CLASS II.—MACHINES UNDER 300 C.C.

1. B. Kershaw (2½ New Imperial) ... Lost 17 marks.
2. L. E. Clulee (2½ Allon) " 67 "
3. A. Elleman (2½ Allon) " 68 "



One of the competitors in the "potato race" event at the Hull Auto Cycle and Light Car Club gymkhana held last Saturday.

TWO NEW SCOOTERS OF THE PLATFORM TYPE.

Sir Henry Norman and Dr. A. M. Low's "Norlow" Described, and Particulars of a Privately-built Scooter.

constructed privately by Capt. Smith-Clarke, who is connected with one of the large Midland car firms.

The Norlow.

Sir Henry Norman and Dr. Low's machine is front wheel driven, and, although smaller and lighter than the American Auto-ped, it somewhat resembles it, in so far as well-guarded disc wheels and folding steering pillar are fitted.

The engine is a 60x60 mm. two-stroke, having an aluminium cylinder with a steel liner. The chain drive will be concealed, and adjustable through a 5in. diameter clutch. A main bearing 3in. long supports the crankshaft but at every other point ball bearings are used.

Petrol lubrication has been adopted as being the most simple, and a carburettor designed especially for the engine is fitted. For ignition the coil system has been adopted, dry batteries supplying the current for both ignition and lighting.

The main part of the engine unit is on one side of the front wheel, the main shaft passing through the centre of the hub, the flywheel being on the opposite side, and driving a countershaft on the fork side by a short chain, from the inner end of

which another chain transmits the power directly to the wheel.

An internal-expanding brake on the front wheel is operated by an upward movement of the steering pillar, and the compression release and throttle controls are by twist grips.

Leaf springs are fitted between the platform and the head, which, with the 2½in. tyres on 16in. wheels, should almost eliminate road shocks. The weight is said to be under 60 lb.

The Norlow will cost about £28, and will shortly be ready for the market, the commercial arrangements being in the hands of Major H. O. D. Segrave, 56, Conduit Street, W.1.

The Smith-Clarke Scooter.

The scooter designed by Capt. Smith-Clarke was made by him for use by his wife for shopping and general runabout purposes, and Mrs. Smith-Clarke informs us that, while the interest of the public is a little embarrassing, the machine has proved very useful.

We have tried this little machine and, while we think it would be improved by a spring fork and larger tyres, we were very favourably impressed by its running. So well distributed is the weight, that when one stands astride it and raises it by the handlebar, the wheels remain parallel with the ground. Capt. Smith-Clarke de-

monstrated that it was possible to ride for long distances without holding the steering bar.

We were particularly struck with the design and method of construction. The tubular portion is all triangulated, while the construction is such that "building" is reduced to mere assembling.

The framework consists of two steel plates, six tubes, with flattened and drilled ends, and a head and fork assembly with very few brazed joints. The engine fitted has a bore and stroke of 55 mm. and 60 mm. respectively, and has overhead valves. This is placed on one side of the frame, the "outside" flywheel and driving pulley being between the two main plates, with the direct-driven magneto on the opposite footboard. True, by driving the magneto at engine speed, an idle spark occurs in the top of the exhaust

A scooter designed and built by Capt. C. Smith-Clarke for use by his wife, who is now a scooter enthusiast.



stroke, but the higher speed of the magneto makes for easy starting.

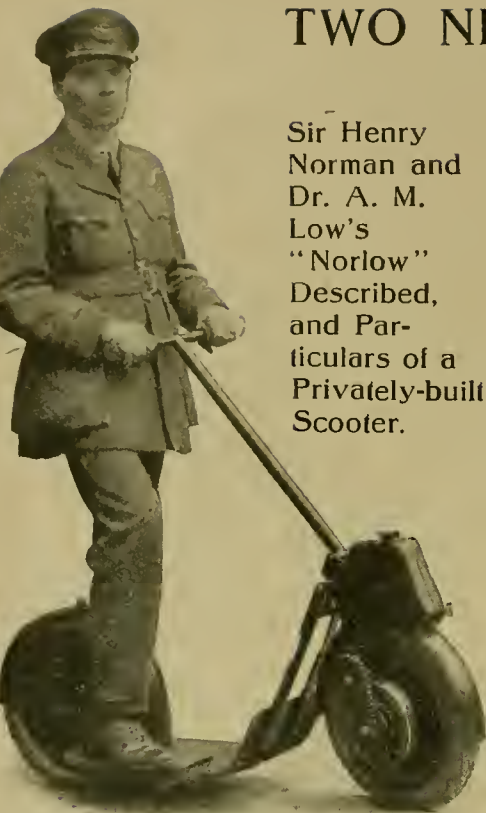
Between the engine and the rear wheel there is a countershaft built up on an ordinary bicycle hub and carrying a V pulley, taking the drive from the engine by a small Whittle belt, and a small sprocket for the final drive.

The wheels are 20x1½in., the Auto-wheel size, and the machine weighs 55 lb.

AN AMERICAN T.T.

DENVER motor cyclists are making efforts to bring about a T.T. race in their district which, if it materialises, will be held on the Fourth of July. The course proposed is a triangular one, just outside the city limits, and eleven and a half miles long. Three sharp bends are included to test human as well as mechanical efficiency.

In stating their claims for the race to be held in their district, Denver motor cyclists mention that the Isle of Man T.T. course is upwards of eight miles. For the benefit of our American readers, we would point out that this course is 37½ miles in length, and is usually covered six times.

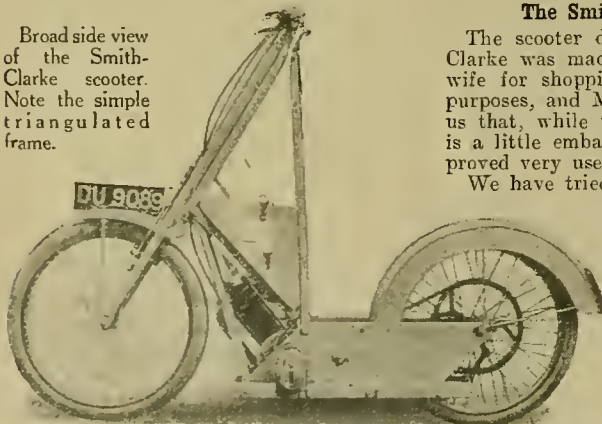


Dr. A. M. Low on the "Norlow," which he designed in conjunction with Sir Henry Norman.

SCOOTER enthusiasts are, at present, divided on the question of "to stand" or "not to stand," and the designs of the several little vehicles we have illustrated, and others which are in the experimental stage, are of two types—those fitted with seats, or saddles, and, therefore, to all intents and purposes miniature motor cycles, and those on which the accommodation is merely a platform.

Two additional machines of the latter type are illustrated, both of which are the designs of engineers, the Norlow being the result of experiments by Sir Henry Norman and Dr. A. M. Low, A.C.G.I., etc., and the other designed and

Broad side view of the Smith-Clarke scooter. Note the simple triangulated frame.



QUESTIONS AND REPLIES

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C.4, and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

The Local Taxation Licence.

Q. Having sold my car (for which I took out a £4 4s. licence in January), and having bought a sidecar outfit, can I have the licence transferred?—MOTOR.

There is no need for you to take any further steps. The same local taxation licence will do (the greater including the lesser).

Erratic Running.

Q. I have an early 2½ h.p. Douglas, which is very erratic when working the throttle. When running at a slow speed and opening the throttle it does not increase speed for a time; then it suddenly races off at a terrible pace. Would you be good enough to tell me how to rectify this? Is the petrol level too high?—C.W.J.

The trouble seems to be probably due to a partial obstruction in the jet, which clears itself. As the machine is an old one, we should recommend you to overhaul it carefully; see that the valve tappets have the correct clearance, that the valves are in order, and that the springs are of the correct tension.

Timing.

Q. (1.) Are the inlet valve guides of the 1913 and 1914 2½ h.p. Douglas detachable? (2.) If so, how can I get mine out, as they seem to have become practically welded in? (3.) What is the correct valve timing for a 2½ h.p. Douglas?—B.G.B.

(1-2.) Up to the 1916 model Douglas, valve guides were not made detachable, therefore you cannot get them out. (3.) The valves should be timed as follows: The exhaust valve closes $\frac{1}{8}$ in. after the piston has completed the exhaust stroke. The inlet valve opens $\frac{1}{8}$ in. after the piston has begun the induction stroke. When one cylinder has been timed the other will follow suit. To time the engine, remove the cage and washers securing the timing wheel spindles. Slacken the nut securing the toothed wheel to which the valve cams are attached, and loosen the wheel by pulling it forward. The inside cam operates the exhaust valve. Bring the piston to the top of its stroke, move round the cam against the valve tappet, in the opposite direction to that in which the flywheel moves, until it has just ceased to bear against the tappet, then move the flywheel forward so that the piston descends $\frac{1}{8}$ in., and mesh the gears. The valves will then be found to be set accurately.

Pre-ignition.

Q. I have a 1915 2½ h.p. Douglas, and, after running a few miles, the engine stops on any long hill. The stop is preceded by a series of jerks, and changing into low gear does not remedy matters. I have cleaned the jet (a No. 24), and, so far as I know, the Amac carburetter is quite all right. What puzzles me most is that, after stopping on the hill for a moment, a slight push starts the engine again, and it takes the hill satisfactorily. I should be extremely obliged if you could help me, as a local garage can only suggest a larger jet, which, seeing the hill failure is a recent development, can hardly be the source of the trouble.—J.H.B.

The trouble is probably due to the use of an unsuitable plug, which causes pre-ignition and the engine to behave in the manner described in your letter.

Scott Timing and Lubrication.

Q. I have a 1916 Scott, and I should be glad if you could put me right on two things. The first is I can get the right-hand cylinder to fire quite regularly, but the left will not fire at all, although everything seems all right, including the ignition. The second is I do not understand the mechanical lubricating system.—W.C.S.

The correct timing is as follows: begin with the left-hand cylinder, see that the piston is at the top of the stroke, and the contact breaker fully retarded. The platinum points should then be fully broken on the back segment. The rear high-tension wire should go to the left-hand cylinder. This applies to the Bosch magneto. The failure of the left-hand cylinder to fire is probably due to an air leak or defective crank case compression. The lubrication system is fully described in the Scott handbook. We presume your machine is fitted with a drip feed lubricator. Oil can run through to the crank case when the crank is in one position only, that is, the vertical, as the slot in the gland controlling this coincides with the oil-hole at this point, which is arranged so that at a particular moment the vacuum in the crank case is at its maximum, which occurs just prior to the inlet port opening to the carburetter, consequently the maximum quantity of oil can be sucked in. If the machine is in good order and no leaks occur at the oil pipe unions the suction is sufficient to operate the oiling, and all that is necessary is to regulate it by adjustment of the lubricator screw.

The pump plunger can be fixed in a down position by the clip provided, and can be instantly released should an extra amount of oil be required, the spring underneath the plunger putting pressure on the column of oil in addition to the suction.

Overheating.

Q. I recently purchased a 2½ h.p. two-speed, 1915 model Allon. This machine runs excellently on the level, and I have no difficulty in starting up. I have checked the timing, and it is correct: I give a fairly rapid drip of oil, but there is a great falling off of power on hills; even changing to bottom speed does not improve matters, as the machine usually peters out within 100 yards. There is no difficulty in restarting, and it usually manages the rest of the hill. The petrol level is correct. (1.) What is the cause of the trouble? (2.) Can I fit a more efficient silencer without impairing the engine's efficiency? (3.) If well tuned, will this machine take a featherweight sidecar?—L.P.J.

(1.) Evidently you are using too large a jet; also try a plug which is specially designed for two-strokes. New piston rings, which are too tight, may have been fitted. (2.) We are afraid you cannot alter the silencer without impairing efficiency. (3.) The engine in question is not suitable for serious sidecar work.

Running on Benzole.

Q. I have tried running my motor cycle on half benzole and half No. 3 petrol, and find it better on hills than No. 3 alone. Some people say benzole, even if thus diluted, will corrode and eat away the inside of the tank in time, while others say benzole used alone does no harm. (1.) By using half benzole and half No. 3 petrol, is there any danger of my tank being corroded inside? (2.) Would any harm be done to the engine or carburetter? (3.) Would it overheat the engine? (4.) Is there any guarantee that benzole bought has any harmful ingredients removed?—V.Q.

(1.) We should not think there is the slightest danger of corrosion in your tank; (2) or any harm to your engine or carburetter; (3) or overheating through the use of benzole. (4.) A standard of benzole has lately been adopted, and if the benzole is found to contain any harmful ingredients the matter should be reported to the National Benzole Association, Horseferry Road, Westminster, London, S.W.1.



Typical war-worn motor cycles offered for sale by auction. The majority of above are minus tyres and generally in a dilapidated condition.

The Result of Neglect.

[?] I have a 5 h.p. Indian, 1915, the left twist handle of which is practically immovable (the machine has been standing for 2½ years), except by using great force. I intended, therefore, to dismantle it in order to put matters right. Although I have taken the small screw out, I have not been able to get the twist handle off. I should be greatly obliged if you could tell me how to do it.—B.H.

The rubber grip is fitted on to a metal sleeve which goes over the handle-bar. The grip should be soaked in boiling water for five or ten minutes, when it can be twisted off. This will expose the nut which holds the sleeve to the inner control rod. The metal sleeve must then be removed together with the tube and cap at the front of the bar where the universal control is fitted. The cap is held in position by a small cheese-headed screw. After the removal of these parts, the control can be pulled a short way through the handle-bar at the forward end, and the universal joint can be detached by knocking out the rivet. This will allow the controls to be pulled out from the grip end.

A Cracked Crank Case.

[?] (1.) Would a cracked aluminium crank case be detrimental to hill climbing, etc.? (2.) Would it be possible to cause loss of compression in a four-stroke motor cycle engine? (3.) Could the crank case be repaired by oxy-acetylene, or electric welding, or by any other means? (4.) Could you give a rough estimate of the cost of the repair? (5.) Is a 3½ h.p. combination, with two-speed Roc gear, capable of carrying 27½ stone weight, over average roads, say with 19 stone on the motor cycle and 8½ stone in the sidecar?—W.W.

(1.) While the fact that the crank case is cracked could not be said to be

detrimental to the running of the engine, it is always possible that the crack may develop and cause serious trouble, and also that the oil may leak from the crack and a seized engine might result. (2.) Certainly this would not cause loss of compression in a four-stroke engine. (3.) It should be possible to weld the crank case. We should recommend you to get into communication with the following firms: Barimar, Ltd., 10, Poland Street, London, W.1; and the Oxygen Welding Works, Ltd., 44, New Summer Street, Birmingham. (4.) We regret to say we cannot give you an estimate of the cost. (5.) We should say that the machine would be distinctly overloaded.

The Low-tension Magneto.

[?] In 1916 I bought an N.S.U. for £11, and used it for about six days, when I was called up for service. It ran all right then, but was rather difficult to start; it has an accumulator magneto, B. and B. carburetter, and a 3½ h.p. single-cylinder engine, which pulls splendidly. From what I can gather from your book, "Motor Cycles and How to Manage Them," I should say it is good enough to learn on. Do you think it would be worth while to have an up-to-date magneto fitted on this machine? The present one is in front of the engine and is driven direct, but is worked by an accumulator in the front part of the tank. I am going to do as you suggest in your book—get familiar with the working of a motor cycle and then go in for a really good machine, and a new one.—C.I.

As you bought the machine cheaply it would be well worth keeping to learn on. The existing magneto should be quite satisfactory, though it is clear you do not understand its working. It is a low-tension magneto, the current from which is raised to a high-tension by a coil carried in the tank, not by an accumulator, as you suggest.

RECOMMENDED ROUTES.

DERBY TO HITCHIN.—S. DU R.

Derby, Castle Donington, Loughborough, Leicester, Market Harborough, Kettering, Higham Ferrers, Bedford, Shefford, Hitchin.

CARDIFF TO WOLVERHAMPTON.—H.E.J.

Cardiff, Newport, Chepstow, Lydney Junction, Newnham, Gloucester, Tewkesbury, Worcester, Hartlebury Junction, Stourbridge, Wolverhampton.

WEYMOUTH TO LONDON.—A.B.M.

Weymouth, Dorchester, Blandford, Thickthorn, Salisbury, Andover, Basingstoke, Hartley Row, Bagshot, Egham, Staines, Hounslow, London.

BRISTOL TO NOTTINGHAM.—G.E.J.

Filton, Alveston, right fork to Stone, Gloucester, Cheltenham, Winchcombe, Broadway, Stratford-on-Avon, Warwick, Kenilworth, Coventry, Hinckley, Ibstock, Whitwick, Isley, Walton, Long Eaton, Nottingham. Approximately 163 miles.

COVENTRY TO KING'S LYNN.—C.D.

Coventry, Binley, Brinklow, Stretton, Pailton, Lutterworth, Kibworth, Husband's Bosworth, Lubenham, Market Harborough, Stoke Albany, Cottingham, Corby Weldon, Oundle, Warrington, Elton, Chesterton, Peterborough, Eye, Thorney, Guyhirne, Wisbech, Walton, King's Lynn. Distance, 90 miles.

EDMONTON TO BOURNEMOUTH.—T.B.R.

Edmonton, Seven Sisters Road, Camden Town, Albany Street, Marylebone Road, across Edgware Road, Oxford and Cambridge Terrace, Bayswater Road, Shepherd's Bush Road, Hammersmith Bridge, Castelnau, Barnes, Roehampton, Kingston Hill, Kingston, Surbiton, Thames Ditton, Esher, Cobham, Ripley, Guildford, Hog's Back, Farnham, Alton, Winchester, Romsey, Cadnam, Lyndhurst, Christchurch, Bournemouth.



PATROLS and CAR THIEVES.

The A.A. patrol does things outside the province of other guardians of public interests, and the present epidemic of motor car thefts discloses additional evidence of his real utility.

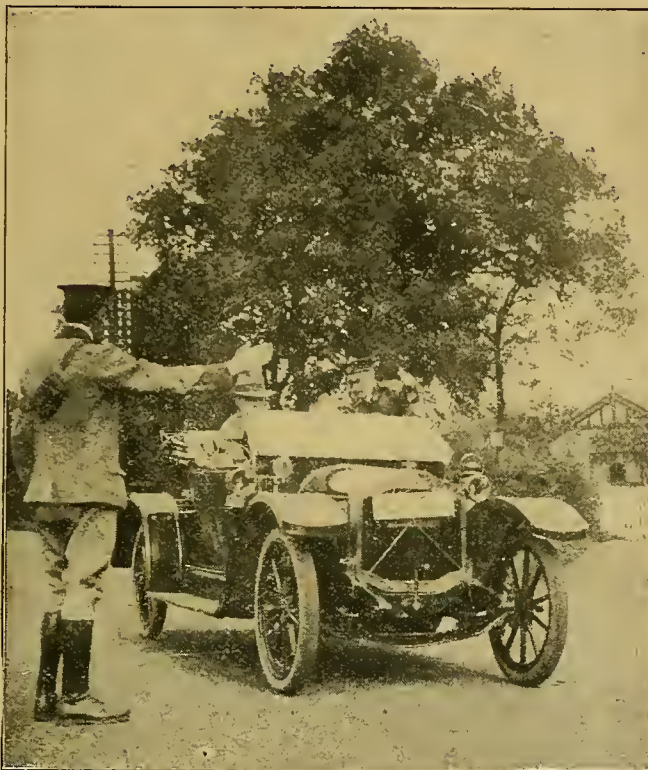
A member
loses his car or motor cycle,
either after leaving it standing for a few minutes, or from his private garage during the night. He may notify the police, but his most practical course is to telephone particulars immediately to the nearest A.A. office.

As soon as this information is received by the Association, a full description of the stolen vehicle, i.e., make, horse-power, colour, registered number, and other essential details is telephoned to the A.A. Branch Office and all the A.A. roadside sentry box telephones.

The patrols in charge, in turn, pass the information to all other patrols in their districts, or these men may receive telegrams from A.A. Headquarters.

The hue and cry is raised!

It is one of the ordinary duties of the patrols to record the numbers of all the cars and motor cycles



they see on their beats. It is, therefore, practically impossible for a stolen vehicle to be used on a road patrolled by the A.A. during daylight, without leaving clues concerning its whereabouts.

Cases are on record where the watchfulness of the patrols has resulted in a ring fence being drawn round the thief, and he has been driven to

abandon the car on the road,

with an empty fuel tank, for, in addition to tracking the thief, the patrols pass their information to garages, thereby rendering it difficult for the thief to obtain petrol or other supplies

When the car is seen, "necessary action" is taken for bringing it to a standstill. If such action is unsuccessful, the patrols use the wires running between the A.A. roadside telephones, and the

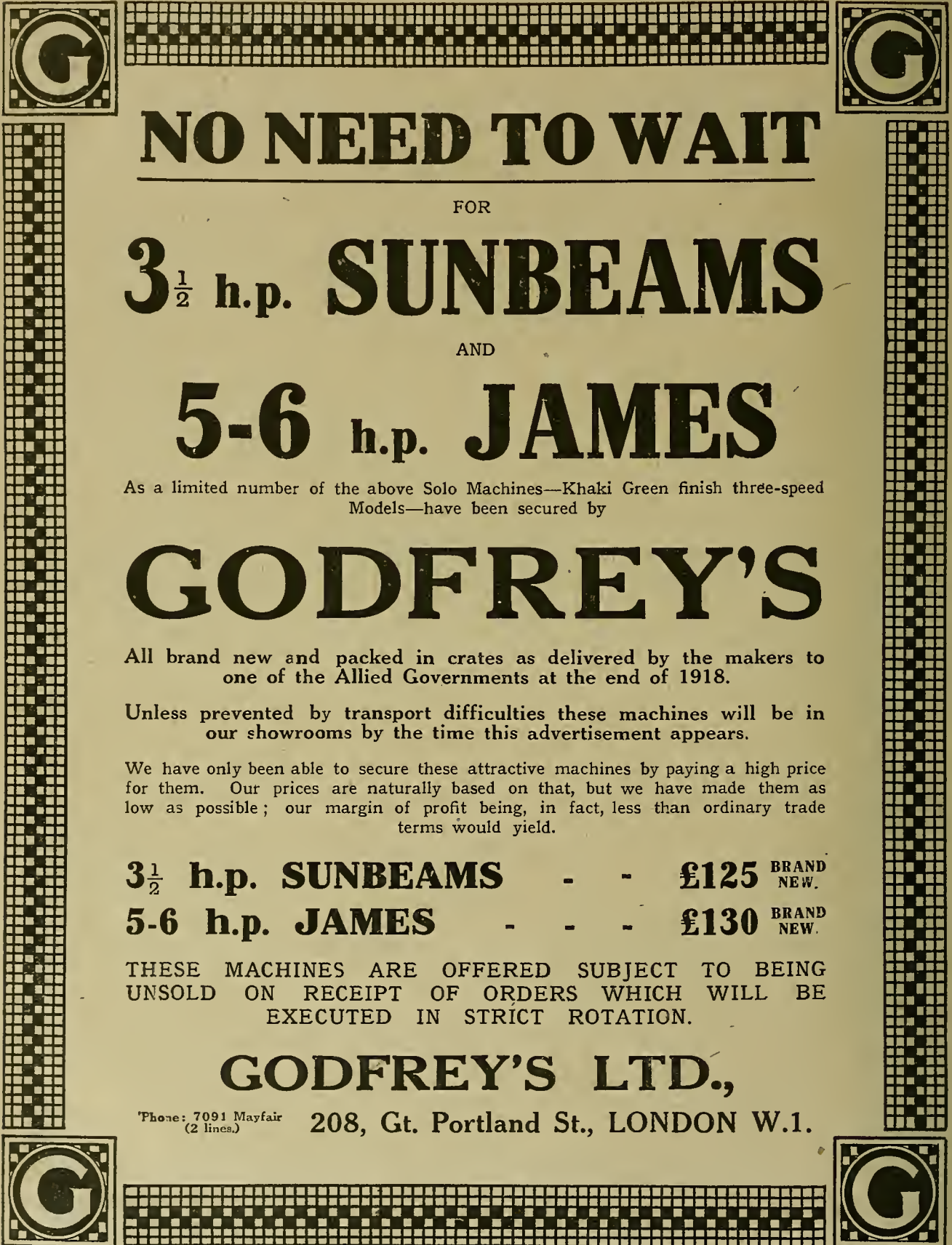
thief's progress is ultimately arrested,

unless he leaves the main road.

A.A. patrols are the "special police" of British motoring. While motor car thefts are rampant, the wise motorist will join the Automobile Association, and become entitled to their services in this connection, and benefit by the thousand and one other unique services afforded by membership of the A.A.

Every motorist who desires information as to the other privileges enjoyed by the members of the Automobile Association should read the booklet, "The Key to the Open Road," a copy of which can be obtained from the Secretary, A.A. & M.U., 21, Fannum House, Whitcomb Street, London, W.C.2.





NO NEED TO WAIT

FOR

3 $\frac{1}{2}$ h.p. SUNBEAMS

AND

5-6 h.p. JAMES

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MOTOR CYCLES FOR SALE.

Brown.

BROWN, $3\frac{1}{2}$ h.p., 3-speed, twin, free engine, wicker sidecar, in good running order and condition; £32.—T. Lucas, jun., Gas Works, Long Breckby, Rugby. [X2377]

B.S.A.

B.S.A.—Early deliveries from Turner Bros., 134, Upper Thames St., London, E.C. [2843]

NEW B.S.A.'s; repairs, overhauls, spares; any make supplied.—Alexander, Agent, 108, Wallasey Village. [1506]

1 b.p. B.S.A., clutch model, good condition; £36. 32 —Evenings, 74, Dollis Park, Church End, Finchley. [2761]

4 1 h.p. 1916 B.S.A., 3-speeds, chain-cum-belt transmission; 60 gns.—Wanchope's, 9, Sboa Lane, London. [2856]

B.S.A., 1913 clutch model, excellent condition, little used; £45; after 6.—6, Claverley Villas, Finchley, N. [2671]

JONES' Garage, special agents for B.S.A., Broadway, Muswell Hill, N.10, and Woodside Parade, North Finchley. [2919]

FOR SALE, B.S.A. $3\frac{1}{2}$ h.p. combination, 1915, free engine, 2 speeds, little used; £80.—Williams, Stanford-in-the-Vale, Berks. [2702]

B.S.A. 1919 Models. Deliveries commence shortly. Book up now.—George Smith's Motor Cycle Depot, Clapham Junction. [3034]

B.S.A. 1915 Combination, coach, 2 speeds, k.s., new condition, perfect order; £74, bargain.—53, Russell Rd., South Tottenham. [2394]

19 14 B.S.A., Tourist Trophy Model, stored since 1916, fine condition; best offer over £35 secures.—82, Balaam St., Plaistow, London, E. [2992]

B.S.A. Combination, 1914, stored 2 years, 2-speed clutch, tyres and belt, new; £85, spot cash, no offers.—Taylor, 54, Bishop St., Shrewsbury. [2611]

B.S.A. 1915 $4\frac{1}{2}$ h.p., 3 speeds, countershaft, clutch, K.S., all-chain, like new; seen running; offers.—Acacia House, Centre Av., Acton (side door). [2968]

19 16 B.S.A. $4\frac{1}{2}$ h.p. 3-speed Combination, suitable for tradesman, or without body, perfect; £80.—Agar, 34, St. John's Terrace, Sutton-at-Hone, Kent. [X2276]

B.S.A., $4\frac{1}{2}$ h.p., late 1913, single-gear model, stored during war, guaranteed perfect running order; accept £35, quick sale; silence negative.—Owen, Colyton, Devon. [X2210]

19 19 B.S.A. Model K, coachbuilt sidecar, P. and H. lamps, speedometer, horn, not done 600 miles; best offer over £105; seen only by appointment.—H. Bagott, 48, Broad St., Oxford. [X2215]

B.S.A., all-chain, 3-speed, kick start, coachbuilt sidecar, lamps, horn, done about 800 miles, as new; only wants seeing; £110, bargain.—Smith, 3, Parade, Staines Rd., Bedford, Middlesex. [2590]

LATE 1916 B.S.A. Combination, coachbuilt sidecar, speedometer, Klaxon, P.H. lamps, all accessories, splendid condition, little running; 80 gns.—Pennington, Berkeley House, Lymington, near Folkestone. [X2600]

B.S.A. 1915 $3\frac{1}{2}$ h.p. Combination, 3-speed, clutch, kick start, new belt and spare, O.B. sidecar, nearly new, new tyre and tube, splendid running condition; trial; £95.—Whait, Craven St., Melton Mowbray. [2750]

B.S.A., $4\frac{1}{2}$ h.p., late 1914, all chain, coachbuilt combination, 3-speed countershaft, lamps, speedometer, etc., stored 2 years, excellent condition; 85 gns.—Watkins, 2b, Morgan Mansions, Holloway, N.7. [2955]

19 19 B.S.A., $4\frac{1}{2}$ h.p., 3-speed, chain-cum-belt, model K, complete with Lucas lamp set and horn, first-class condition, ridden 300 miles, owner leaving district; what offers?—Box 4,009, c/o The Motor Cycle. [X2329]

B.S.A., 3-speed, K.S., late 1915, K., chain and belt, new gear box, good tyres, Lucas set, mechanical horn, reliable machine, go anywhere; £65; no rubbish; exchange Triumph or Norton.—Box 4,620, c/o The Motor Cycle. [X2560]

B.S.A. Combination, 1915, 3-speed, chain-cum-belt, fully equipped, speedometer, etc., perfect condition, mileage 9,000, 160 miles 2 gallons 21st May, tyres as new; £89.—Izzard, 585, Green Lanes, N.8. 'Phone: Hornsey 2214. [2491]

B.S.A., 1919, 3-speed, $4\frac{1}{2}$ h.p., countershaft gear, chain-cum-belt, not done 300 miles, only delivered from works last month, as new; £83/10, no offers; owner giving up.—Draper, Rottingdean, near Brighton, Sussex. [2528]

19 19 B.S.A., $4\frac{1}{2}$ h.p., Model K, as new, with horn, delivered March, not done 300 miles, Dunlops, with No. 4 Bowser coachbuilt sidecar and apron, delivered April, all perfect condition, guarantees and receipted bills shown; appointment, trial; £107.—Colman, 36, North Bailey, Durham. [X2217]

B.S.A., 1917, $4\frac{1}{2}$ h.p., chain-driven, 3-speed, B.S.A. countershaft clutch, K.S., E.I.C. magneto, tyres as new, Chater-Lea light coachbuilt sidecar (will separate), splendid condition throughout; thorough trial given; £100, or best offer spot cash.—61, Railway Approach, East Grinstead. [2982]

B.S.A.—The Birmingham City agents and specialists who confine their business absolutely to B.S.A. manufactures always holds the most complete stock of motor cycles, sidecars, bicycles, etc., and can give immediate delivery of all replacements.—The Conny Cycle and Motor Co., 507-8, Broad St. 'Phone: Midland 753. [7250]



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Midget size	1/6
Cycle size	2/6
Motor size	5/-

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Terry's One-minute Tyre Levers, 3 in one Set	price 1/0
Strong Single Tyre Levers, 6in.	7d.
Ditto, 9in.	1/2
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Auto-Wheel, only run 700 miles, price £13 13s.

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Ditto, 18in.	7/-
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6in. ditto	7/6
4in. King Dick pattern	3/6
6in. ditto	4/9
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11in. ditto	6/9
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light, strong, easily fixed, celluloid panel, nickel plated fittings, price 55/-; or complete with side curtains made in stout waterproof khaki	60/-
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MOTOR CYCLES FOR SALE.

B.S.A.

B.S.A. $3\frac{1}{2}$ h.p., 1913, 2-speed, free engine, pedalling gear for starting, stored greater part war, recently overhauled, splendid condition, complete with new electric lamp, electric horn, batteries, tools, pump; trial on deposit of amount; owner has car; bargain, £60 cash.—Kennard, Dumption House, Ramsgate. Tel.: 374. [X2355]

Calthorpe.

CALTHORPE Junior, Precision 2-stroke, 2-speed; £30.—82, Downs Park Rd., Hackney Downs. [2780]

CALTHORPE 2-stroke, 2-speed, perfect order; £37/10.—134, Cherry Orchard Rd., Croydon. [2741]

CALTHORPE Combination, 8-10 h.p., torpede sidecar, condition as new; £110.—Melrose, 1, Kenlor Rd., Tooting. [2949]

CALTHORPE, 1918, 2-stroke, lady's, Enfield 2-speed, as new; 52 gns.—Church House, 16, Maida Hill West, W.2. [2705]

CALTHORPE-J.A.P., 1916, $2\frac{1}{2}$ h.p., Enfield 2-speed, splendid condition; £47.—Spalding, 4, High St., Chelmsford. [2663]

19 16 Calthorpe-Jap, $2\frac{1}{2}$ h.p., 2-speed, just overhauled; letters only; first cheque secures.—7, William Place, Enfield. [2636]

CALTHORPE Junior, Precision, 2-speed, free engine, fine condition, all accessories, ready ride away; £35.—87, Truro Rd., Wood Green. [X2463]

CALTHORPE-J.A.P., $2\frac{1}{2}$ h.p., in perfect order, just been overhauled, Enfield 2-speed, all accessories; £40, no offers.—After 6 p.m., 10, Bisham Gardens, Highgate Hill. [2471]

CALTHORPE-J.A.P., 1915, $2\frac{1}{2}$ h.p., Enfield 2-speed, F.E., new tyres, recently overhauled, splendid condition throughout; £37; appointment.—61, Ellerton Rd., Surbiton. [2657]

19 17 Calthorpe-Jap $2\frac{1}{2}$ h.p., Enfield 2-speed, 2 generators and lamps, mudshield, special carrier, spare belt, etc., good condition; £50.—Pengelly, Trinity House, Abingdon, Berks. [X2558]

Campion.

CAMPION-PRECISION lightweight, 2-speed, good condition; £25.—Sgt. Errington, A.O.C. Hut, Lydd Camp. [2675]

2 1/2 h.p. Campion (Jap), 2-speeds, chain-cum-belt, excellent condition; £40.—Reeves, Guildford Rd., Farnborough, Hants. [2676]

CAMPION-J.A.P., $4\frac{1}{2}$ h.p., 2 speeds, free engine, condition perfect; £40.—Taylor, Brownlow Cottage, Pleasington, Blackburn. [2799]

CAMPION-J.A.P. 8 h.p., 1918 model, all-chain drive, 3 speeds, and O.B. sidecar, in perfect order, and little used; £125.—Raynam, Saffron Walden. [2891]

19 16 Campion 6 h.p. Combination, J.A.P. engine, 3-speed, countershaft, kick start, fully equipped, new tyres, splendid condition; after 6 o'clock; no dealers; £118.—317, Camden Rd., Holloway. [2662]

19 15 Campion Motor Cycle and coachbuilt sidecar, $4\frac{1}{2}$ h.p. Precision, B. and B., Jardine countershaft, chain, 2 speeds, free engine, kick start, good running order; 85 gns.—C. W. Hamel, 8, Park Rd. North, Bedford. [X2268]

19 15 Campion $4\frac{1}{2}$ h.p. Precision Combination, 2-speed, K.S., chain drive, Bosch mag., Millford sidecar, plating as new, perfect condition; £110.—Bampton, 132, Herrick Rd., Loughborough, Leicestershire. [2833]

Centaur.

3 1/2 h.p. Centaur and Sidecar, Mabon clutch, Bosch 32 mag.; £28.—Stanley, 56, Montague Rd., Cambridge. [X2604]

3 1/2 h.p. Centaur, chain drive, lamps, horn, etc.; £27. 32 —9, The Parade, Cambridge Rd., Northampton, Surrey. [2640]

CENTAUR, 1913 5-6 h.p. Twin, N.S.U. 2-speed, Bosch, B. and B., good tyres; £38.—12, Temple-sheen Rd., East Sheen, S.W.14. [X2594]

CENTAUR, T.T., $3\frac{1}{2}$ h.p., 2-speed, Dunlops, Bosch, B. and B., condition like new, been stored 2 years; bargain, £50.—23, Chapel St., Ulverston. [X2397]

Chater-Jap.

4 h.p. Chater-Jap, Bosch, 2-speed; £45.—47, Queen's Terrace, Newcastle. [X2372]

3 1/2 h.p. Chater-Jap, B.B., Bosch, new belt, tyres nearly new, variable pulley, take 2 up Reigate, in splendid condition; £45, a snap.—Jonas, 882, Garratt Lane, Tooting. [2887]

£85, or near offer.—8 h.p. Chater-Jap coachbuilt combination, 3-speed, clutch, handle start, all lamps, accessories, perfect running order.—After 8 p.m., 67, High St., St. John's Wood, N.W. [2603]

CHATER-JAP T.T. 6 h.p. twin, spring frame model, countershaft gears, enclosed Bosch, Binks, Best and Lloyd; exchange with cash for big single combination; sell £60.—26, Pulleys Av., East Ham, E.6. [2541]

CHATER-J.A.P., 6 h.p., 3-speed Sturmy hub gear, clutch, handle starter, Druids Mark II., fitted to run on paraffin, large roomy sidecar, pillion spring seat, new Palmers, Dunlops, belt, perfect condition throughout, lamps, horn, engine owned, trial, £80; large roomy 2-seater family sidecar for above, £25; all in new condition.—35, Park Rd., Green Lanes, Ilford. After 7. [2876]

MOTOR CYCLES FOR SALE.

Chater-Jap.

£25. 4hp. Chater-Jap. Armstrong 3-speed, F.E. U.I. mag., T.T. bars, R.B. adjusting 6in. adjusting pulley, requires £5 spent on frame, all parts complete.—Ford, Jno., North Moreton, near Wallingford, Berks. [X2367]

Chater-Lea.

CHATER-LEA 8-10hp. 3-speed, mud large sidecar, lamps, and accessories; £75.—Barnes, 308, Upper Richmond Rd., Mortlake. [X2427]

CHATER-LEA, 6-8hp., coachbuilt sidecar, accessories; £65; view by appointment.—"Granton," Gt. North Rd., Highgate, London, N.6. [X23523]

4hp. Chater-Lea, Stevens engine, Grado gear, spring forks, mag., good tyres; £25.—Murray, 37a, Charles St., Hatton Garden, Holborn. [X2431]

CHATER-LEA 4½hp. Combination, 2-speed countershaft gear, perfect condition; trial; 50 gns.—Bark attrace, 149, Bowes Rd., Palmer's Green, N.13. [X2700]

Chater-Lea-Jap.

CHATER-LEA 6hp. Twin J.A.P. Coachbuilt Combination, 3-speed, chain drive, excellent condition, equal to new; any trial; lamp set, horn, ready for tour; £80.—3, Park St., Wellington, Salop. [X2362]

CHATER-LEA, 8hp. J.A.P. engine, 3-speed, hood, screen, pillion seat, speedometer, Lucas horn, mirror, head and tail lamps, in sound mechanical condition; any trial given; £115.—Birch, Littlecot, Sutton-at-Hone, Kent. [X2454]

CHATER-LEA-J.A.P. 8hp. Combination, Nov., 1913, extra large C.B. sidecar, Jardine 2-speed countershaft, Amac, Bosch, Jones speedometer, spring pillion seat, lamps (gas and electric), horn, tyres new, stored during war; any trial; genuine outfit; after 5, 2 Saturdays; £107.—Smith, 32, Gorst Rd., Woking, Woking Common. [X2801]

Chater-Peugeot.

5-6hp. Peugeot, Chater-Lea combination, 3 speeds, hood, speedometer, spares; 50 gns.—30, Homestead Rd., Fulham. [X2593]

Clyno.

CLYNO, 1915, 2½hp., 2-speed, clutch, perfect; 42 gns; offers.—35, Westcombe Park Rd., Blackheath. [X2912]

CROW Bros., High St., Guildford, West Surrey agents for the 1919 Clyno. Order now to ensure early delivery. [X1553]

5-6hp. Clyno Coachbuilt Combination, late 1914, splendid condition, Klaxon, lamps, etc.; £80.—After 6, 16, Ifley Rd., Hammersmith. [X2613]

GROVER, Smith and Willis, Basingstoke.—Agents for Clyno combination. Don't wait until the fine weather comes before placing your order. [X2623]

CLYNO Combination, 6hp., 3 speeds, K.S., Lucas accessories, sound, reliable outfit; bargain, first cheque 95 gns.—Reynolds, Waterbeach, Camba. Phone: No. 7. [X2486]

CLYNO 2-speed Combination, cane sidecar, Bosch Amac; £75, or nearest offer.—Apply after 6.30, two knocks, L 36, Hawarden Grove, Herne Hill, S.E.24. [X2540]

CLYNO Combination, exceptional condition, 3-speed, completely equipped, spares, spare wheel, large Low generator, etc.; £120.—Westlake, Ashford, Middlesex. [X2607]

CLYNO, 1914, 2½hp., 2-speed, 2-stroke, clutch, complete, thoroughly overhauled, 100-120 m.p.g., tyres front good, back 1,000; inspection any time; 45 gns.—Job, St. James's Rd., Hampton Hill, Middlesex. [X2082]

1919 8hp. Clyno Combinations. Deliveries commence in June. Place your order with us at once to ensure early delivery. 1919 Clyno 2-strokes; deliveries this month; order at once.—Kays, 116-122, Pitshanger Lane, Ealing. Tel.: 553 Ealing. [X9694]

CLYNO Motor Cycle, 6hp., beautiful condition, 3-speed countershaft, kick starter, detachable wheels, lamps, horn, speedometer, chains run in oil bath, 700x80 new Palmer Cord tyres (light car), only done 200 miles since 1915, stored during war; inspection invited; price £98.—Apply, after 6 p.m., 31, Little Heath, Charlton, S.E.7. [X2445]

Connaught.

CONNAUGHT, splendid order; £30.—King, The Aviary, Byfleet, Surrey. [X2726]

CONNAUGHT 2-stroke, 2½hp., perfect running; £28.—58, Hamilton Rd., Salisbury. [X2659]

3hp. Connaught 2-stroke, 2-speed, P. and H. lamp set, new condition; £45.—21, Keppel Rd., East Ham. [X2756]

Coulson.

COULSON B; order now.—J. Blake and Co., Liverpool and Manchester. [X0440]

Coventry Eagle.

COVENTRY Eagle, 2-stroke, late model, good condition; £35.—Eldridge, Eastbury, Dukes' Av., Finchley, N.3. [X2587]

Dalman.

DALMAN 2-stroke, 2-speed, perfect running order, nice condition; £32.—Mead, 34, Willes Rd., Kentish Town. [X2568]

Dayton.

DATON 1½hp., new Model de Luxe, in perfect running order; £20, or near offer.—Burrow, Exmouth. [X2610]

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MOTOR CYCLES FOR SALE.

De Dion.

DE DION, 4½hp., hand clutch, good running order; £35.—63, Arlington Rd., Brixton, S.W. [X2527]

Dene.

DENE-J.A.P. Combination, 8hp., 1917, fully equipped, child's seat; £135; after 6 p.m.—78, Plumstead Common Rd., Plumstead, S.E.18. [X2952]

Dot.

8hp. Dot-Jap Combination, O.B. sidecar, 4-point connection, 2-speed gear, all-chain drive, Bosch mag., handle start, all spares, fully equipped; any trial; 75 gns.—669, Ashton New Rd., Clayton, Manchester. [X2369]

Douglas.

DOUGLAS, king of horizontals.—Gourlay, Agent, Fallowfield. [X2571]

1914 Douglas 2-speed 2½hp., in excellent condition; £50.—104, Plough Rd., Battersea, S.W. [X2961]

DOUGLAS 2½hp., 1912-13, T.T., 2-speed, tyres excellent; £45.—Noble, Chemist, Peterborough. [X2873]

DOUGLAS, 1915, T.T., in perfect condition; £55.—Between 7 and 9, 23, Edlerine Av., Norbury. [X2711]

2½hp. Douglas, 2-speed, free, excellent condition, lamp and speedometer.—King, Egrove, Oxford. [X2590]

DOUGLAS 1914 2½hp., 2-speed, new tyres, good order, stored 2 years; £46.—1, Deery, Strabane. [X2070]

DOUGLAS, 2½hp., 1915, been stored; £60, or offer.—Mills, The Firs, Spaniards Rd., Hampstead. [X2819]

DOUGLAS, late, W.D. 2½hp., 2-speed, all lamps, etc.; 52 gns.; as new.—53, Pelham St., S. Kensington. [X2495]

1914 Douglas, 2½hp., Bosch, Amac, perfect order; £45, or best offer.—Box L1,714, c/o The Motor Cycle. [X3006]

DOUGLAS 4hp. Combination, 1914, 3-speed, equipment seen London; £100.—Box 4,037, c/o The Motor Cycle. [X2655]

DOUGLAS.—Best deliveries; 4hp. combination, £110; War Office 2½hp., £65.—Moffat, Yeovil. Phone: 50. [X1103]

DOUGLAS 2-speed, good condition; can be seen after 6 p.m.; £50, or near offer.—112, Herbert Rd., Plumstead. [X2939]

2½hp. Douglas, 1913, 2-speed, Bosch, new tyre, perfect running order; £41.—32, Ballern Grove, Chiswick Lane, W.4. [X2811]

1914 2½hp. 2-speed Douglas Motor Cycle, new tyres, perfect condition; £48, no offers.—Seamark, Old Tiverton Rd., Exeter. [X2731]

1914 (late) Douglas, 2½hp., 2 speeds, splendid condition, like new; best offer over £48.—Box L1,730, c/o The Motor Cycle. [X3022]

DOUGLAS 1913 2½hp., 2 speeds, excellent condition, lamps, etc.; ride away; £42.—Lt. Joslin, Seaplanes, Westgate-on-Sea. [X2420]

2½hp. Douglas, 1915, Lucas accessories, tyres and belt as new; first cheque £54.—Reynolds, Waterbeach, Camba. Phone: No. 7. [X2485]

DOUGLAS, 2-speed, clutch, kick starter, good condition; £50; after 6.—35, Freeridge Rd., Caledonian Rd., Holloway, N. [X2789]

GIBB, The Douglas Expert, Gloucester (Phone: 852), regrets to inform his numerous clients he cannot accept orders for early deliveries. [X4749]

1919 Douglas 2½hp., W.D. model, no accessories, mileage under 200; 69 gns., no offers; deposit, approval.—7, Town St., Ulverston. [X2524]

DOUGLAS Late 1913 2½hp., 2-speed, new condition, new Hutchinsons, long exhaust; £50.—Lurcock, 44, Boston Rd., Hawell, W.7. [X2810]

DOUGLAS New Models, actually in stock, 4hp. combination and 2½hp. 2-speed solo.—Austin's Garage, Hoddesdon, Herts. Phone: 45. [X2795]

1917 Douglas, 2½hp., 2-speed, W.D., good condition, £56; another ditto, but needs carburettor, £53.—Box L1,727, c/o The Motor Cycle. [X3018]

2½hp. Douglas, late 1915, only 800 miles done, new condition, lamps, speedometer, Klaxon; offers.—1, Hillside, Stonebridge Park, Harlesden. [X2392]

DOUGLAS, 1911, single-speed, all good, new Dunlop and belt, needs part assembly; £18/10.—Wightwick, Stanley Rd. Av., Carshalton-on-Hill. [X2457]

DOUGLAS, 2½hp., in excellent condition, carefully stored during the war, ready to ride away; £30, no offers.—Box L1,635, c/o The Motor Cycle. [X2410]

DOUGLAS, 1911, 2-speed, Bosch, good running order, engine recently overhauled, new crankshaft fitted; £20.—Carter, 54, Dover Rd., Walmer. [X2748]

DOUGLAS, 2½hp., smart appearance; £35; ride away; exchange with cash for K.S. twin Indian, Pizzala, 17, Charles St., Hatton Garden, E.O.1. [X2518]

1919 Douglas, 4hp., as new, lamp, horn, speedometer, tools; 96 gns., or exchange recent Triumph, Norton, Rover.—1, Park Parade, Cambridge. [X2658]

DOUGLAS 2½hp. 2-speed, recently overhauled and enamelled, T.T. bars, XL-Air saddle, tyres good; 32 gns.—Hatchford Hill Cottages, Cobham, Surrey. [X2601]

MOTOR CYCLES FOR SALE.

Indian.

- INDIAN 1914 7.9-h.p., T.T. clutch, very fast; £55.—78, Springbank Rd., Hither Green. [2986]
- INDIAN Spring Frame Motor Cycle, in good running order.—30, Vauxhall Walk, S.E. [2935]
- INDIAN 5-h.p., 1915, 3-speed, hand and foot clutch, all in top-hole condition; £75.—27, Peldon Av., Richmond. [27814]
- INDIAN Combination, C.B., clutch model, thorough going order; £65 lowest.—12, Huntsmoor Rd., Woodsworth. [2440]
- 7.9-h.p. Indian Combination, spring frame, speeds and clutch, very fast; £95.—50, Harrow Rd., Leytonstone. [27674]
- 5.6-h.p. Indian, 1915, 3 speeds, clutch, excellent condition; £75; no dealers.—15, Alley Park, West Dulwich, S.E. [X2550]
- INDIAN, 7.9-h.p., free engine, 2-speed, Bosch, excellent condition; £70.—Bambridge, Decorator, Riverside, Kingston, Surrey. [X2370]
- 1914 7.9-h.p. Indian, spring frame, 2-speed, 1916 Canoelet sidecar, overhauled and enamelled. £90.—98, Oak St., Burton-on-Trent. [X2514]
- INDIAN Combination, 7.9-h.p., speeds, electric lighting, in splendid order; £105.—24, Townley Rd., E. Dulwich, S.E., after 6 p.m. [2669]
- 1915 (late) Indian, 7.9-h.p., T.T. clutch model, disc wheels, perfect condition; 65 gns.—109, Down-ton Av., Streatham Hill, S.W.2. [2905]
- INDIAN, 1915, 5-h.p., clutch, 3-speed, ridden 3,000 miles, as new; £75, or offers.—H. Leitwick, 13, Hartington Rd., Chiswick, W.4. [2690]
- LIVERPOOL and District Agents for Indian. Place orders now to secure early delivery.—Victor Hors-mau, Ltd., 9, Parr St., Liverpool. [0002]
- 1916 Powerplus Indian Combination, Hendee coach-built sidecar, excellent condition, new Splitdorf mag.; £110.—Wiles, Littlestone-on-Sea. [2644]
- INDIAN 1914 7.9-h.p., 2-speed, Swan coachbuilt side-car, accessories; £115; exchange lower power.—134, Cherry Orchard Rd., Croydon. [2740]
- 5.6-h.p. Indian Combination, 3-speed, kick starter, clutch, Mills-Fulford coachbuilt sidecar, new condition; £90.—Arthur Belcher, Wantage. [2784]
- 1916 7.9-h.p. Indian Powerplus Combination, splen-did condition, electric lighting, spares, etc.; £130.—Busby, 6, College St., Islington. [X2424]
- INDIAN 1916 7.9-h.p., 3-speed, clutch, in splendid condition, little used, lamps, ready ride away; £80.—Rhoshia Motor Co., Mawneys Rd., Romford. [2981]
- INDIAN Combination, 7.9-h.p., new 1914, 2-speed, lamps, horn, speedometer, mileage 4,300, tip-top condition; £95.—10, Gerald Rd., Bournemouth. [2470]
- 1915 Indian 7.9-h.p., 3-speed Combination, £125; 5.6-h.p., 3-speed Indian, £65; Ridge-Multi coach combination, £62.—24, Beauval Rd., East Dulwich. [2677]
- 1915 Twin Indian 5.6-h.p., 3-speed, Millford coach-built sidecar, wind screw, lamps, Lucas horn, as new; £100.—Jupp, 5, Devonshire Rd., Hove, Sussex. [2894]
- INDIAN C.B. Combination, 5.6-h.p., 1915, smart out-fit, 3 speeds, hand and foot clutch, fully equipped, nearly new tyres; £105.—27, Peldon Av., Richmond. [2781]
- INDIAN, 1915, 5.6-h.p., 3-speed, kick start, disc wheels, new Dunlop tyres, Canoelet sporting sidecar; £100.—23, South Bruton News, Bruton St., W. [2551]
- INDIAN 1915 5.6-h.p. Road Racer, electric lighting, new Swan sidecar, all accessories, exceptionally fast, fine condition; £110.—104, Whitechapel Rd., E.1. [2455]
- INDIAN 1915 (Oct) 7.9-h.p., clutch, road racing model, recently thoroughly overhauled, in splendid condition; £75, a bargain.—Jonas, 882, Garratt Lane, Tooting. [2886]
- INDIAN 7.9-h.p., 1914, red, clutch, speedometer, lamps, splendid condition; exchange Zenith, cash adjustment, or sell £70.—9, Temple St., Basford, Stoke-on-Trent. [X2517]
- INDIAN 7.9-h.p. Combination, coachbuilt, 2-speed, clutch, lamp and generator, horn; £90, or nearest; Wednesday, Saturday.—Birks, 702, Holloway Rd., London, N.19. [2698]
- INDIAN Combination, coachbuilt, 7.9-h.p., 2-speed, clutch, lamps, horn, tools, spares, splendid condition; £80.—Apply (after 6), F.B., 266, South Lambeth Rd., Stockwell. [2407]
- INDIAN 5.6-h.p., 1916 Combination, 3-speed, kick start, speedometer, electric lighting and sycro, new condition; 95 gns.—21, Cole St., Gt. Dover St., Borough, S.E.1. [2906]
- MY Pet Indian, 1916, 7.9-h.p., T.T., will do 70 m.p.h., bought new 1917, plating, enamel, tyres, perfect; £80 or nearest.—Tapstone, Church Rd., Farn-borough, Hants. [2009]
- 1916 Powerplus Indian, 7.9-h.p., with Phoenix sporting sidecar, Binks, electric lighting; seen after 6 p.m.; £120.—Humble, 200, Windmill Rd., Gillingham, Kent. [2473]
- INDIAN 1916 7.9-h.p. Powerplus Model G and Indian Sidecar, the whole outfit as new, not done 1,000 miles; £140.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0551]

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MOTOR CYCLES FOR SALE.

Indian.

- £42.—Indian 5.6-h.p., T.T., very fast, English con-trols, B. and H. new tyres, spare valves, etc., re-quires few adjustments, otherwise sound.—Jackson, The Springs, Bingley, Yorks. [2988]
- POWERPLUS Indian, just re-enamelled, with Mill-ford sidecar and apron, as new, little used, with new set of lamps; price £125, or best offer.—Pottier, 25, Bently St., Birmingham. [X2087]
- INDIAN, late 1913, 7.9-h.p., T.T. road racer, clutch model, in perfect running order, smart appearance, tyres good as new, complete with lamps and all accessories; £62.—F. McEwen, Bluntisham, Hants. [2586]
- 1915 7.9-h.p. Indian Coachbuilt Combination, spring frame, 3 speeds, clutch, kick start, lamps, horn, etc., being overhauled; 95 gns., no offers.—Morley, seen at 8, The Village, Old Charlton, S.E. [X2485]
- INDIAN Combination, 7.9-h.p., 1914 model, 2-speed, clutch, and k.s., electric lamps, Phoenix sporting sidecar and disc wheels, all in splendid condition; £95.—A.C.S., 91, Bellenden Rd., Peckham, S.E.15. [2441]
- INDIAN Combination, 5.6-h.p., late 1915, 3-speed, clutch, and kick start, new tyres and new sidecar, in perfect running order, stored 2 years, splendid con-dition; £100.—Ward, 18, Wendell Rd., Shepherd's Bush, W.12. [2848]
- 7.9-h.p. Indian Combination, coachbuilt sporting sidecar, 3-speed gear, clutch, and kick-starter, fast machine, late 1915 model, £145; also another with large sidecar, price £135.—Wanchop's, 9, Shoe Lane, London. [2850]
- INDIAN Combination, 1915, spring frame, 3 speeds, 3 electric lamps and horn, coachbuilt De Luxe sidecar, new tyres, extra luggage carrier, spare chains and accessories; £100; seen Louder.—Box 4,040, c/o The Motor Cycle. [2815]
- 1915 Indian Combination, spring frame, 3-speed, clutch, quick start, Klaxon, lamps, speedometer, tools complete, new tyres, hood, excellent condition; £90, no offer.—Barbezat, 53, St. Margaret's Rd., East Twickenham, S.W. [2993]
- POWERPLUS Mag. Dynamo Sprung Frame Indian Combination, in splendid condition, 7.9-h.p., hand and foot clutch, luxurious Mills-Fulford side-car, very easy starter, tools, etc.; £140.—Ramsden, Brincair, Wakefield. [2598]
- INDIAN Combination, Hendee Special, July, 1914, 7.9-h.p., countershaft gears, clutch, chain drive, electric starter and horn, dynamo lighting, speedometer, etc., mileage 3,500, tools, spares; 116 gns.—Lingard, Bridgeholme, Chapen-en-le-Frith. [X2496]
- 1915 Indian 7.9-h.p., new P. and H. lamps, chains, valves, etc., many replacements, just been thor-oughly overhauled, guaranteed in perfect mechanical condition — owner going abroad; £75.—L.T. Mayes, 10, Stanhope Terrace, Regent's Park, N.W.1. [X2272]
- 1916 Powerplus 7.9-h.p., T.T., 3 speeds, kick starter, dual controlled clutch, speedometer, luxurious Indian torpedo sidecar, discs all through, just over-hauled and renovated, equal to new, a beautiful outfit; £145.—Jones, 882, Garratt Lane, Tooting. [2885]
- LATE 1914 7.9-h.p. Indian, with sporting coachbuilt sidecar, 2 speeds, clutch, kick start, disc wheels, luggage grid, petrol carrier, wind screen, electric light-ing, electric and mechanical horns, very smart outfit; £110.—436, Whitehorse Rd., Thornton Heath. [2796]
- INDIAN 7.9-h.p., October, 1915, stored 2 years, 3 speed, kick starter, Phoenix sporting sidecar, locked in tail, 4-point attachment, aeroplane wind screen, alu-minium footboards, disc wheels, T.T. bars, long copper exhaust pipe, 5 electric lamps and horn, speedometer, special car type clutch pedal, petrol filter, extra leaves and shock absorbers to springs, overhauled, re-enamelled and varnished throughout, front and sidecar tyres un-structured, tools, spares, including chain; £120.—Lient, R. Nichols, 95, Cheriton Rd., Folkestone. [2889]
- Ivy.
- 1919 Ivy 2-stroke de Luxe Model, brand new, not yet ridden, enamelled buff, fitted new Klaxon horn, pump, tools, etc.; £55.—Write, Box 11,720, c/o The Motor Cycle. [3012]
- Ixion.
- LATE 1914 Ixion-Villiers 2-stroke, perfect order and good tune; £32; after 7 p.m.—107, Tyecroft Rd., Norbury, S.W.16. [2643]
- James.
- FOR Sale, James 4 1/2-h.p. combination, 3-speed counter-shaft, all-chain drive; £60.—Merry, 19, Victoria St., Nuneaton. [2584]
- JAMES.—Sole agents for Hertfordshire, 1919 mu-chines in stock.—Chandler, Reye and Williams, Sun St., Hitchin. [0997]
- 4 1/2-h.p. James Combination, perfect condition; what offers?—E. H. Hockley, Hatfield Heath, Essex. (Station Sawbridgeworth, G.E.R.) [2687]
- JAMES Combination, 1915 1/2, 3 speeds, countershaft, Canoelet sidecar, little used, beautiful condition; £95.—34, Birmingham Rd., Oldbury. [X2310]
- JAMES, 4 1/2-h.p., clutch model, excellent condition, £40; also Farnir, 3 1/2-h.p., Bosch, free engine, £20.—16, Belmont Rd., Maidenhead. [X2557]
- JAMES 4 1/2-h.p., big single, 3-speed hub gear, clutch, Bosch, B. and B., good tyres, fine condition; £55; overhauls.—105, Croydon Rd., Anerley, S.E. [2890]
- 1913 James, big single, and coach sidecar, 3-speed countershaft, chain, kick starter, Binks carbu-rettor, perfect condition, lamps, etc., complete; £75.—Plant, 10, North St., Derby. [X2483]

MOTOR CYCLES FOR SALE.

James.

JAMES 1914 Combination, 3-speed, countershaft, all-chain drive, kick start, fitted lamp set, speedometer, nearly new Dunlop tyres; £65.—Goss, 71, South Side, Clapham Common, S.W.4. Phone: 322 Brixton. [2910]

1915 James, 4½ h.p., big single Canelet Combination complete, privately owned, carefully used, splendid condition, 2 lamps, tools, sundry spares, ready for road; 84 gns., delivered, no offers.—Childs, Melbury, Dorchester. [2526]

1919 3-speed 5½ h.p. James and de luxe sidecar, kick starter, luggage grid, Klaxon, and tools complete, tyres unpunctured, mileage 800, absolutely perfect, £130; 4 h.p. clutch solo machine taken part exchange, must be of recent date.—Masscy, 45, Upper Tichborne St., Leicester. [2383]

4½ h.p. James Combination, 1916 model, 3-speed countershaft, foot clutch, kick starter, all-chain enclosed drive, Stewart speedometer, lamps, horn, apron, screen, new condition throughout, exceptionally smart outfit, 85 gns., bargain, reason for selling, no accommodation.—Hickmore, Kullah, Shalford, Surrey. [X2069]

JAMES 1919 5½ h.p. Twin Combination de Luxe, 3-speed, foot and hand-controlled clutch, best Lucas acetylene head lamp, electric sidecar and tail lamp, Klaxon horn, speedometer, wind screen, spare chain, tube, etc., as new, only done 400 miles; best offer secures; owner bought car.—Box L1,718, c/o The Motor Cycle. [3010]

J.A.P.

J.A.P., 7 h.p., a.r., new mag., coachbuilt sidecar; £40.—Neale, Thornwood, Epping. [2633]

J.A.P., 4 h.p., 1914 clutch, overhauled; trial; £39.—Moss, Churchill Rd., Bordesley Green, Birmingham. [X2518]

J.A.P. 4 h.p. Motor Cycle, brand new; £50; after 6.—251, Cricklewood Lane, Child's Hill, N.W.2. [2635]

1916 4 h.p. J.A.P., Bosch, B. and B., solo, after 6.30; £32.—Hubbard, 137, Hertford Rd., Enfield Wash. [2618]

J.A.P. 4 h.p., m.o.v., B.B., Bosch, Druids, tyres as new, ready drive away, 1912; £30.—T. W. Shaw, Wellington, Salop. [X2563]

J.A.P., 4 h.p., as new, 3 speeds, clutch, fully equipped, tools, etc., real sidecar machine; £54, no offers whatever.—Mason, Hawkstone Hall, near Shrewsbury (Hodnet Station). [X2507]

J.A.P. 4 h.p., Bosch, B. and B., Druid forks, N.S.U. gear, new belt, and spare tyre, rebushed and re-enamelled; £25; seen by appointment.—Owen, Stoke Grange, near Grantham. [X2417]

J.A.P., 1916, 2½ h.p., 2-speed countershaft, perfect running order, stored 18 months; £40; unemployment cause of selling; first cash secures.—18, Nelson Av., Wellington Lane, Hull. [X2068]

J.E.S.

LEA-FRANCIS Model de Luxe, as new, Sturmer-Archer 3-speed, 28 in. frame, fitted J.E.S. auxiliary motor, ready to ride away; £25.—194, Brighton Rd., Croydon. [2365]

J.E.S. Motor Cycle, 1½ h.p., very good condition, rider forks, original tyres, good running order, ride away; £12/10; trial here, suit lady rider.—Kynolds, Butcher, Wimbington, Cambs. [X2360]

Kalcumbe

KALCOMBE 3 h.p., Bosch, Amac, lamp, horn; ride away; bargain.—2, Westerdale Rd., Greenwich. [2492]

Kerry

KERRY, 3½ h.p., splendid condition, lamps, horn, take sidecar, ride away; £28; before 6 p.m.—36, Shaftesbury Rd., Forest Gate. [2665]

KERRY-ABINGDON and Sidecar, good running order, 2-speed, hand starter, lamps, watch, mirror, and spare wheel; £75, or nearest.—30, Star Hill, Rochester. [2951]

King Dick.

3½ h.p. King Dick, 2-speed, clutch, free engine; £22.—Full particulars, Box L1,715, c/o The Motor Cycle. [3007]

Lea-Francis.

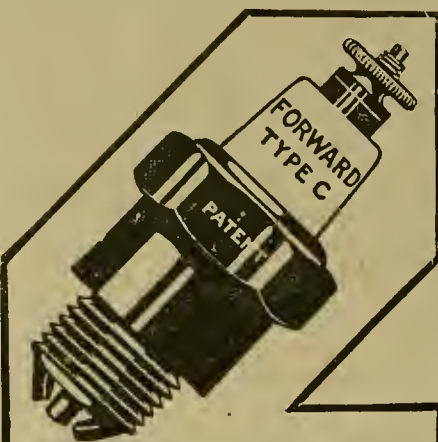
LEA-FRANCIS 1916 4 h.p. Twin, 2 speeds, countershaft, kick starter, enclosed chain drive, detachable wheels, excellent condition; any trial; £75.—Percy Nann, Whitfield, Ipswich. (D) [2864]

4 h.p. 1915 Lea-Francis, 3-speed, kick start, all-enclosed chain drive, quick detachable wheels, with Milford cane sidecar, lamps, horn, speedometer; £85.—Ridings, 70, Long St., Middleton. [X2588]

LEA-FRANCIS, 3½ h.p., 2-speed, hand and foot clutch, K.S., spares, under 4,000 miles, retired, perfect condition, Cowey speedometer, Lucas horn and lamps; £80.—45, Obarlton Rd., Blackheath, S.E. [X2481]

LEA-FRANCIS 1916 3-speed Twin, laid up two years, Lucas head light, mechanical horn, detachable wheels, enclosed all-chain drive, condition as new, magnificent sidecar machine; £95.—Smeal, Rose Cottage, Dunbar. [X2393]

LEA-FRANCIS, 3½ h.p. twin J.A.P. engine with latest large valves and springs, late 1915, stored 3 years, only used one season by original owner, 3-speed countershaft gear, kick starter, hand and foot-controlled clutch, enclosed chains, special Bosch mag., extra large Brooks saddle, oversize tyres, lighting, detachable wheels, splendid condition throughout, reliable and fast.—Moss, Wem. [X2425]



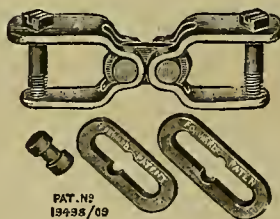
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"About three years ago I sent for one of your FORWARD Belt Fasteners for my (Big Six) Motor Cycle Combination. Up to that time I had tried almost every make of fastener, but every one failed. Almost every time I went out I broke a fastener, and I got downright sick of it. So you will understand how pleased I am to say that since I put in your Forward I have never had a break."

If you want a cheaper but excellent Fastener, there is

THE KING HOOK.

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FORWARD SPARKING PLUG Co., SUMMER ROW, BIRMINGHAM.

MOTOR CYCLES FOR SALE.

Lea-Francis.

LEA-FRANCIS, No. A1006, late 1915, 3½ h.p. J.A.P., 3-speed, clutch, kick start, Bosch, Amac, Druids, horn, tools, all enclosed chain drive, tyres and original enamel perfect, very little used, not done over 1,500 miles, smart appearance, very silent, fast, and does about 55 m.p.g., now under overhaul at Holland's Garage, Sleaford, Lincs., preparatory to sale; owner getting light car; easily worth £85, but near offers considered.—Apply, Capt. Watkins, Bridge Cottage, Scopwick, Lincs. [X2220]

Levis.

2½ h.p. Levis, 1916, excellent condition, lamps; £38.—61, Glenesk Rd., Eltham, S.E.9. [2699]

LEVIS, 2½ h.p., fast, excellent condition, all accessories.—Lovekin, Whitby, near Chester. [X2312]

BROOK Bros., Burnham, can deliver a Levis Popular cycle from stock; £44/13. Write to-day. [2424]

LEVIS 2½ h.p., perfect condition, new Dunlops, excellent climber; £32.—243, Waverley Rd., Reading. [2751]

LEVIS, 2½ h.p., new tyres and belt, splendid condition; £32/10.—1, The Rise, Crayford, Kent. [2762]

LEVIS, in good condition; £32.—3a, Devonshire Row Mews, Devonshire St. (off Gt. Portland St.), W. [2402]

LEVIS Popular, stored during war, original enamel, Hove. [X2083]

2½ h.p. Levis, tyres as new, Bosch mag.; ride away; £42.—229—Sutton, 63, Leathwhite Rd., Clapham Common, S.W.11. [X2579]

1916 Levis 2½ h.p., horn, electric lamps, speedometer, nearly new tyres; 30 gns.—P., Prospect House, Sandgate, Kent. [2456]

1916 Levis 2-stroke Popular Model, excellent condition, fitted complete with P. and H. lamps, horn, pump, tools, etc.; £44.—Write, Box L1,721, c/o The Motor Cycle. [3013]

LEVIS Popular, 2½ h.p., new last January, practically unused, sight lubricator, perfect order; £42, no offers.—Shrimpton, 24, Battersea Rise, Clapham Common, S.W. [2898]

Lincoln-Elk.

LINCOLN-ELK 3½ h.p., Bosch mag.; what offers?—Rogers, Braughing, Ware, Herts. [2537]

LINCOLN-ELK 4½ h.p., 2-speed, K.S.; £40, or nearest.—75, Abercrombie Av., High Wycombe. [2846]

L.M.C.

L.M.C. 4½ h.p., 1915, just overhauled, and in first-class condition, with wicker sidecar; £55.—Scotia Motor Co., Lochgelly. [X2066]

L.M.C. Motor Cycles.—The motor cycle with the comforts of a car. All models available shortly.—The sole distributing agents for London and the Home Counties, Mebes and Mebes, the original light car specialists, 144, 154-6, Gt. Portland St., W.1. Tel.: 3426 Mayfair. [2270]

FOR Sale, 6 h.p. L.M.C., 1916, 3-speed countershaft, stored 2½ years, coach sidecar, lamps, horn, etc., equal to new, £85, powerful machine; 6 h.p. 1914 Enfield and wicker sidecar, stored 2 years, mechanically perfect, 2-speed, lamp and horn. £65.—Supply Stores, Strathane. [X2584]

Lugton.

LUGTON, 3½ h.p., 1913, 2-speed, F.E. and kick start, Bosch waterproof mag., nearly new tyres, absolutely sound; £40.—Gibson, Towercroft, Eynsford, Kent. [X2209]

M.A.C.

4 h.p. M.A.C., just overhauled at a cost of £17, fitted with 1917 B.B. carburettor, Bosch mag., new Lucas lamps front and rear, Lucas horn, free engine, handle start, drip feed lubricator, tyres nearly new; bargain, £30; sidecar chassis springs and tyre, £2.—Frank P. Bomford, Drakes Broughton, near Pershore. [X2325]

Matchless.

MATCHLESS, 6 h.p., 1915, not done 1,000 miles; a beauty; £115.—53, Russell Rd., South Tottenham. [2395]

JONES' Garage, special agents for Matchless, Broadway, Muswell Hill, N.10, and Woodside Parade, North Finchley. [2921]

CROW Bros., High St., Guildford, West Surrey agents for the 1919 Matchless. Order now to ensure early delivery. [1552]

8 h.p. Matchless, 1913, 2-speed, clutch, sound engine, Gloria spring-wheel sidecar; £85.—15, Enmore Rd., S. Norwood, S.E. [2792]

MATCHLESS Victory Combination, interchangeable wheels, 3 speeds, new 15th May; £148.—113, Rodney Rd., Waltham, S.E. [2956]

MATCHLESS-JAP, 4 h.p., Binka, Bosch, T.T. 1914-15, perfect condition, fast, seen after 5.30; £68.—22, Racton Rd., Fulham, S.W.6. [2674]

MATCHLESS-J.A.P. Combination, 8 h.p., 2-speed, free engine, kick start, 1913, stored last 2 years, in good condition; £85.—A.W., 50, Market St., Watford. [2443]

1919 New Model H Matchless Combinations. Place your order with us at once to ensure early delivery.—Kays, 116-122, Pittsinger Lane, Ealing. Tel.: 553 Ealing. [9695]

MOTOR CYCLES FOR SALE.

Premier.

PREMIER, 3½ h.p., Sturmey 3-speed clutch, wicker sidecar, plating and enamel shabby, good running order; appointment letter; best over £40.—Stockdale, De la Warr Rd., East Grinstead. [2812]

PREMIER Combination, Bosch, 3-speed hub, clutch, tools, spare tubes, belt, etc., footboards, sidecar, wicker, upholstered leather, enamel good condition; £50.—Box L1.693, c/o The Motor Cycle. [2621]

PREMIER, 3½ h.p., 3 speeds, countershaft, F.E. clutch, large 2-seater cane sidecar (1 for child), £65 cash; another, similar, but hub gears, £50.—Hill, Ninfeld, Battle. Tel.: 201X7 Bexhill. [2973]

7-9h.p. Premier Combination, Fulford Empress sidecar, 3-speed, clutch, 3 new tyres, just thoroughly overhauled by makers, as good as new; £110.—Arc Engraving, Ashcombe Rd., Wimbledon. [2542]

P.V.

P.V.-J.A.P., 3½ h.p. twin, and Middleton sporting sidecar (S.C. new), tyres new, complete, splendid condition; price £70.—P. K. Butler, 46, Newlands Park, Sydenham, S.E. [2709]

Quadrant.

2½ h.p. Quadrant Lightweight, single-speed; £28.—4 93, Tollington Park, London, N.4. [X2368]

3½ h.p. Quadrant, Bosch magneto, B. and B., new 2½ tyres, ride away; £34.—11, Portland Rd., South Norwood, S.E.25. [2957]

4 h.p. Quadrant, Bosch mag., Chater-Lea frame, splendid running order; £29; after 7 p.m.—7, Eckington Gardens, New Cross, S.E.14. [2520]

Radco.

SALE, 1914 Radco 2-stroke, excellent condition; £25.—17, Regent St., Rugby. [X2091]

RADCO 2½ h.p., 2-stroke, excellent condition; £35.—78, Springbank Rd., Hither Green. [2987]

RADCO 2½ h.p. 2-stroke, absolutely perfect, ready to ride; £35.—Chalkley, The Broadway, New Southgate. [2772]

RADCO 2-stroke, 2½ h.p., 1918, equal to new, will climb any hill; a bargain, £42.—Jonas, 382, Gerrard Lane, Tooting. [2588]

JONES' Garage, special agents for Radco, Broadway, Muswell Hill, N.10, and Woodside Parade, North Finchley. [2923]

1914 Radco 2½ h.p. 2-stroke, just been thoroughly overhauled, and in splendid running condition; £32.—257, Cavendish Rd., Balham, S.W.12. [2822]

RADCO 2-stroke, perfect condition, very little used, aluminium footboards, Stewart speedometer, 2 good lamps, etc.; bargain, £25.—Tyler, Grocer, 13, Robey St., Stratford, E. [2443]

Rex

REX 3½ h.p., R.E., running order; £12.—111, Midland Rd., Nuneaton. [X2555]

5 h.p. Rex, 2 speeds, free engine, fine running order; £42.—Cross, Jeweller, Rotherham. [X2614]

6 h.p. Rex Combination, splendid condition; £65, or near.—Green, New Dale, Wellington, Salop. [2605]

REX, 6 h.p., 2-speed, cracked cylinder, otherwise good; £20.—Urquhart, Fire Station, Fulham Rd. [2558]

REX 3½ h.p., Bosch mag., B. and B., footboards, needs adjusting; £18.—33, Elizabeth St., Leigh, Lancs. [X2583]

REX 1913 6 h.p. Twin Combination, overhauled, ready for road; £75.—R., 30, Brunswick Sq., Camberwell, S.E. [2421]

REX, 5½ h.p., good condition, old pattern, less mag.; £15.—Horiey, (see at) 8, The Village, Old Charlton, S.E. [X2486]

COMBINATION, twin Rex 5-6 h.p., 2 speeds, overhead valves; £70.—Denson, 56, Blinco Rd., Peterborough. [X2603]

REX 2½ h.p., splendid condition, wants mag.; £16.—Wyle, Manchester Rd., Marsden, near Huddersfield. [2585a]

REX 3½ h.p., B. and B., h.b.c., footboards, enamel good condition, complete; £8; room wanted; bargain.—56, William St., Blackwood. [X2487]

REX 3½ h.p., adjustable pulley, new tyres and belt, Bosch watertight mag., De Luxe saddle; £22.—2, Canton Terrace, Farningham, Kent. [2831]

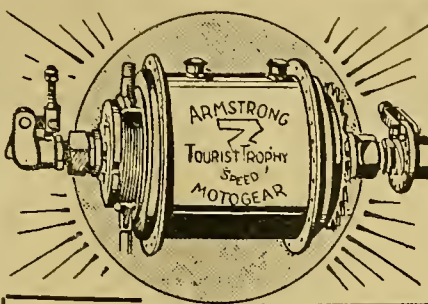
1916 Rex Combination, 6-8 h.p., coachbuilt sidecar, first-class condition, climb anything; £130.—A. Robinson and Sons, Derby Rd., Hinckley. [X2266]

REX 2-speed, handle start, twin Bosch mag., less engine; £25 lot, bargain, or buy J.A.P. 6-8 h.p. engine, fit above.—Rhodes, Hillside Av., Debross, Dr. Oldham. [2817]

1911 Rex, 6 h.p.; £35; 3 speeds and clutch, B. and B. carburettor, Bosch mag., in perfect running order.—Herrington, Easthamstead, Bracknell, Berks. [X2421]

REX 1914 7-9 h.p. Combination, new coach sidecar, 2-speed, handle start, splendid condition, just overhauled; nearest £90; before 6 p.m.—36, Shaftesbury Rd., Forest Gate. [2667]

ONE Rex Motor Cycle, 1910 model, 3½ h.p., minus mag., carburettor, and belt, engine just been overhauled and as good as new; what offers.—Mr. S. Cooper, Regent St., Finedon, Wellingborough. [X2318]



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True happiness depends upon Freedom from Worry.

TO many hundreds of motor cyclists the pleasure of the Whitsuntide ride or tour will be in great part due to the fact that their

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has been repaired by us, and is consequently as reliable as when it was fitted.

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Wires: "Threespeed."

Send wheels to Hounslow, L. & S.W. Ry., clearly labelled with sender's name. Nearest station for callers, Heston—HOUNSLOW, District Railway.

MOTOR CYCLES FOR SALE.

Rex.

6 h.p. Rex do Luxe Combination, 2-speed, clutch, kick start, £10 electric lighting set, engine overhauled and rebushed, new tank, etc., excellent condition, all grey finish; £92, or nearest.—3, Warwick Av., Coventry. (10) [X2387]

8 h.p. Rex, 1914, and coachbuilt sidecar, 3-speed countershaft, Binks carburettor, over 70 m.p.g., complete with 3 lamps, speedometer, clock, and 2 horns, good condition, and in perfect running order, fast and reliable; £89.—"Southborne," Ogden Rd., Bramhall, Cheshire. [X2494]

Rex-Jap.

REX-J.A.P. Coachbuilt Combination, 6-8 h.p., new tyres, lamps, requires a few repairs; £80.—Melrose, 1, Kenlor Rd., Tooting. [2950]

Roc

5 h.p. Roc Twin Combination, underslung, 2-speed, free engine, tyres good; £46.—79, Upton Lane, Forest Gate. [2560]

ROC, 4 h.p., 2 speeds, just been overhauled, new tyres and tubes, complete with all accessories; £40, or offers.—11, White, 16, Stockwell St., Greenwich. [2554]

Rover.

ROVER 3½ h.p. T.T. Model, 1915; £55.—Morris, Swepton, Leicestershire. [2480a]

ROVER, 3½ h.p., clutch, in very nice order; £51.—C.A.E. Co., 21, Hobson St., Cambridge. [2633]

1914 Rover, 3½ h.p., 3-speed, clutch, tyres, belt excellent, ready ride away.—King, Egrove, Oxford. [X2592]

ROVER 3½ h.p. T.T. Model, Philipson pulley, very fast, new; £79/10.—Morris, Swepton, Leicestershire. [2480]

ROVER, 3½ h.p., 3-speed, free engine, Bosch, just overhauled; £46.—Ball, 49, High St., Kingston-on-Thames. [X2369]

JONES' Garage, special agents for Rovers, Broadway, Muswell Hill, N.10, and Woodside Parade, North Finchley. [2924]

ROVER Combination, 3 speeds, clutch, screen, all in excellent condition, outfit looks like new; £75.—27, Peldon Av., Richmond. [2783]

ROVER—Several T.T. with or without Philipson pulley (second-hand), in excellent condition.—Turpin, 29, Preston Rd., Brighton. [1758]

1917 T.T. Rover, Philipson, condition as new, Lucas lamp sets, all spares complete; £70, no offers.—59, Hamlet Gardens, Ravenscourt Park, W.6. (5 to 7 p.m.) [X2555]

ROVER, 1917-18, 3½ h.p., T.T., Philipson, practically unsprayed, very fast, lamps, tools etc.; £68, first cheque secures.—Lt. Cunningham, 25, Leicester St., Southampton. [2379]

T.T. Rover, late 1916, 3½ h.p., Philipson pulley, exceedingly fast, and in exceptional condition, equipped with lamps, horn, knee grips, etc.; 65 gns.—Loweth, 6, Mount Pleasant Rd., Laling. [2307]

ROVER, 3½ h.p., 1914, single-speed, Senspray, Bosch, speedometer, new Palmer, 3 belts, fast and powerful, stored during war; 40 gns.—A. P. White, Cavendish Chambers, Buxton. [2566]

ROVER, 3½ h.p., Philipson, M.L.R. and B., lamps, horn, speedometer, tools, 1 new spare belt, very fast, in perfect running order, excellent condition; 58 gns.; evenings.—136, Brixton Rd., S.W.9. [2308]

ROVER 1917 T.T., Philipson, not done 1,500, owner abroad from April, 1917 to 1919, very fast, in first-class condition, tyres not marked, horn, lamps, tools; 80 gns.—Lloyd, Assam House, South Woodford. [2459]

ROVER 1914 3½ h.p., 3-speed, clutch, Millford coachbuilt sidecar, the whole in capital condition, new Goodyear studded cover on sidecar wheel; £60; would separate.—P. Charles, Newhouse, Northiam, Sussex. [2842]

4 h.p. Rover, 3-speed, clutch, tools, 2 lamps, 2 generators, mirror, horn, not ridden 500 miles since bought new 1914, perfect throughout, with Canoelet C.B. sidecar, hood, screen, Lucas lamp and generator; great bargain, £75; seen any time.—J. Harrison, 55, High St., Eastleigh. [2816]

Royal Ruby.

JONES' Garage, special agents for Royal Rubys, Broadway, Muswell Hill, N.10, and Woodside Parade, North Finchley. [2925]

1916 Royal Ruby 2-stroke, splendid condition, new heavy Dunlop and tubes, P. and H. lamp set; first £35.—Wiles, Littlestone-on-Sea. [2645]

1916-17 Royal Ruby 4-stroke, 2½ h.p. J.A.P., countershaft gears, lamps, handpump, spares, good condition; 38 gns.; part exchange combination.—Goodwin, St. Pancras Schools, near Watford. [2393]

Rudge.

1915 5-6 h.p. Rudge Multi, splendid condition; accept £55.—Todd, Waterbeach, Cambs. [2436]

RUDGE Multi, 5-6 h.p., 1915, new condition.—After 6 p.m., 24, Townley Rd., E. Dulwich, S.E. [2882]

RUDGE, 3½ h.p., hand clutch, very fast, powerful; £35.—Davis, 211, Garratt Lane, Wandsworth. [2916]

NEW 1919 3½ h.p. Rudge Multi, insurance policy and registration paid.—Maxted, Queen's College, Cambridge. [2489]

MOTOR CYCLES FOR SALE.

Rudge.

RUDGE 3½ h.p., tyres nearly new; 38 gns., lowest, bargain.—Brown, Rangenore Village, Burton-on-Trent. [X2476]

1916 Rudge Multi Combination, auto oil feed, splendid lot; bargain, £95.—Drew, 1, Station Rd., Upton-st. [X2358]

RUDGE, 3½ h.p., and sidecar, clutch model, h.b.c., spare tyre, tube, and accessories; £53.—56, Old St., E.C.1. [X2713]

31 h.p. Rudge and Sidecar, pedal starter, F.E., good 2nd order; £55.—Edwards, 73, Lyndhurst Grove, Peckham. [X2468]

31 h.p. Rudge, red tank, T.T. bars, about 1913 2nd model; price £47/10.—Wauchope's, 9, Shoe Lane, London. [X2854]

RUDGE 3½ h.p., T.T., variable gear, engine, tyres, and belt in excellent condition; £40.—156, Archway Rd., N.6. [X2996]

JONES' Garage, special agents for Rudge, Broadway, Muswell Hill, N.10, and Woodside Parade, North Finchley. [X2926]

31 h.p. Rudge Multi, pedal start, late model, fant 32 oiler, clutch in excellent order; £45.—200, High St., Tooting, S.W. [X2945]

RUDGE 3½ h.p. Multi, 1913, good condition; £35, or exchange combination or light car.—Jack Reid, 69, Curris St., Cwm, Mon. [X2296]

1914 3½ h.p. Rudge and Sidecar, N.S.U. 2-speed, lamps, etc., splendid condition; 60 gns.—Simmonds, Pimlico, Hemel Hempstead, Herts. [X2813]

RUDGE Combination, Grade Multi gear, coachbuilt sidecar, in excellent condition; £55; seen any time after Friday noon.—Bryant, 46, Northam St., Fratton, Portsmouth. [X2376]

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RUFFLES.—Delivery from stock, 2½ h.p., 2-speed.—W. H. Grimes and Co., 18a, Bruton Place, New Bond St., W. [X2107]

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SCOTT Combination, 1912, completely overhauled new chains, 1913 frame, mileage 5,000; £62/10.—37, Balvernie Grove, Southfields, S.W.18. [X2305]

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SUN-VILLIERS 2-stroke, 2-speed, 1913 Thomson-Bennett mag., Binks 3-jet carburetter, P. and H. head, Lucas tail lamps, Lucas horn, Dunlop back nearly new, front good, Brooks saddle; first cheque about £40 secures.—Beale, 19, Victoria St., Paignton. [X2845]

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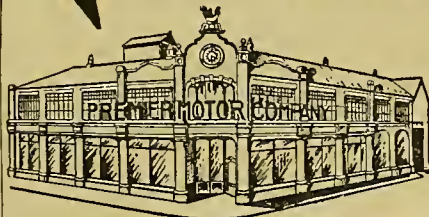
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BUNELIA 2-seater, good tyres, 4 lamps; £49.—Read's Garage, New Malden, Surrey. [1875]

SINGER Tricar, 8h.p., in running order, 3-speed and reverse; £55.—C.H., The Garlands, Caterham Valley. [X2307]

8h.p. A.C. Sociable, 2-speeds and reverse, an up-to-date model, very smart; 100 gns.—Wanchope's, 9, Shoe Lane, London. [2858]

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Forks?

They take

ALL

the shocks
because they're

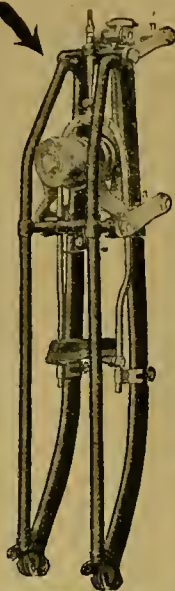
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Saxon Spring Forks are the embodiment of all that is necessary to absorb the vibration on **YOUR** machine. No others are exactly like them, nor quite so good, because Saxons are the only anti-vibratory spring forks that

Take ALL
the Shocks

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Digbeth, BIRMINGHAM.



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LIGHT CARS

AT

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Any make not earlier than 1914 model.

No risk in dealing with us. Cash on sight. Write, 'phone, or call with machine if possible.

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RUNABOUTS AND CYCLE CARS.

SALE, Morgan, 1914, perfect, hood, screen, air-cooled J.A.P. twin; trial by appointment; £85.—17, Regent St., Rugby. [X2080]

3-WHEEL 6h.p. Rex, w.c. engine, new, mag. carburettor, and tyres perfect condition; trial; £35.—53, Idonia St., Deptford, S.E. [2776]

A.C. Sociable, new condition, new tyres all round; £85, or exchange combination, cash adjustment.—134, Cherry Orchard Rd., Croydon. [2743]

PREMIER 3-wheel Cycle Car, water-cooled, up-to-date, very sporty, in excellent condition, good hill-climber; £85.—Tom Foy, Alpine Villa, Kidwelly. [2944]

GRAND Prix Morgan, 1916, water-cooled, overhauled, very fast and comfortable, disc wheels, and accessories, good tyres; £185.—Conisbro, Rickmansworth Rd., Watford. [X2247]

CARDEN Monocar, late model, twin J.A.P. engine, 2-speed, dome guards, lamps, etc., splendid order; £90.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0492]

RAILWAY Garage, Staines (Phone: 139), offer: New 1914 cycle car, £145; Salmon, 10h.p., streamline tail, scarlet, £235; Carden 1919 monocars, 105 gns., delivery about one month. [2722]

MORGAN Grand Prix, W.C., disc wheels, special engine, Zenith carburettor, foot accelerator, auxiliary tank, pressure feed, hood, screen, lamp, etc.; £185.—Seen after 3 at 85, Camden Mews, N.W. [2679]

A.C. Sociable, splendid condition, 2-speed, hood, lamps, 3 new tyres, new chain, Bosch mag., B. and B. carburettor, mechanically perfect; £45, or near offer.—Hillyer, 21, High St., Shoeburyess, Essex. [2940]

A.C. Sociable, complete with hood, screen, 5 lamps, 3 new car tyres and tubes, Bosch, engine just overhauled, numerous spares, and a thoroughly reliable machine; £75; bargain.—76, Cromwell Rd., Luton. [2525]

DE DION 10h.p. Water-cooled Cycle Car, Bosch mag., Zenith carburettor, Grado gears, sporting type, brass acetylene head lamps, horn and accessories, perfect condition, any trial; £85.—L. F. Truman, 52, High St., Sidcup, Kent. [2408]

CARDEN Sporting Monocar, 8h.p. J.A.P. engine, automatic carburettor, Aero wind screen, speed-fast, practically new, Palmer tyres, £87, no offers; also 2½h.p. Culthorpe-Jap, 1917 model, electric lighting, etc., £40.—Filton, Pildacre Mills, Dewsbury. [1796]

OFFICER Leaving North Wales Hospital, and unable to complete, wishes to sell Morgan type chassis, 3-speed gear box fixed, 8h.p. twin Precision engine (new), steering fixed, 700×80 wire wheels, tyres fair, two chains, £55; also Star light car chassis, gear box fitted, steering less column and wheel, £15; or 265 whole lot.—Lieut. Hall, Oulton, 52, Pretoria Rd., Streatham, London, S.W.16. [2548]

CARDEN Monocars, 1919 models, deliveries daily.—The Railway Garage, Staines (Phone: 139), sole concessionaires, commend these ideal little runabouts as thoroughly practical for pleasure, for professional, and commercial use in even the busiest districts. No starting handle. Seat kick-starter can be operated by lady with ease. Specification: 8h.p. J.A.P. engine, Sturmer-Archer 3-speed gear box, all controls inside, perfect accessibility, 55 m.p.h. if required, 60 m.p.g. easily, Dunlop tyres; price 105 gns.; accessories, tandem seat extra. Supplied in strict rotation against deposit with order. Delivery about one month. Call and inspect. [2723]

CARS FOR SALE.

12h.p. Sizaire-Naudin 2-seater; £120.—Talbot Hotel Garage, Stourbridge. [X2500]

MAXWELL 1917 4-seater Car; £295.—29, St. Leonard's St., Bromley-by-Bow. [2840]

12h.p. Forman 2-seater, good order and condition; £180.—Talbot Hotel Garage, Stourbridge. [X2499]

1914 Hummerette, 8h.p. twin, a.c., runs well, lamps, hood, screen; £120.—Shaw, Jeweller, Wellington, Sidcup. [X2361]

1915 Transball 2-seater, very good appearance and condition; £135.—Talbot Hotel Garage, Stourbridge. [X2497]

1914 12-16h.p. New Pick, 4-seater, very smart and good condition; £275.—Talbot Hotel Garage, Stourbridge. [X2498]

8h.p. De Dion car, 3-speed and reverse, 2-seater; £47/10, running order.—Wanchope's, 9, Shoe Lane, London. [2857]

8h.p. Rover, mechanically perfect and sound (less tyres), 4-seater, hood; £25.—Carter, The Bush, Abbey Foregate, Shrewsbury. [X2360]

10h.p. Stanley Steamer, 2-seater, sound boiler, running order; £30, or exchange A.C. 3-wheeler.—Riley, 40, Sun St., Ulverston. [X2568]

9h.p. 2-cyl. Renault 4-seater, 3 speeds, reverse, hood, screen, and running order; £75.—Murray, 37a, Charles St., Hatton Garden, Holborn. [X2430]

10h.p. Talbot, good condition, tyres and tubes good, lumps, stored 4½ years; 90 gns., or exchange good combination; after 6.30.—48, Church St., Luton, Beds. [X2475]

2-SEATER Car, 8-10h.p., hood, screen, Ford body, wire wheels, 3-speed and reverse, in good condition except gear box needs slight repair; £25; room wanted.—22, Church Lane, Battersea Square. [2862]

AGENCIES.

AGENCY.—A well-established Dutch firm are open to accept agency for first-class firm of manufacturers of cycle and motor accessories, also tyres.—Address in first instance, Box H.Y. 637, c/o of Jackson's, 19, Cullum St., E.C.3. [2550]

W. SAUNDERS, Ltd.—This private company was registered on March 12th, 1919, with a capital of £12,000 in £1 share. Objects, to acquire the Red Garage and Motor and Engineering Works of the late W. W. Saunders, 26 and 28, Crouch St., Colchester, one of the oldest established motor businesses in the county of Essex. W. Saunders, Ltd., still have vacancies as agents (sole or otherwise) for high-class cars, light cars, runabouts, and motor cycles.—Tel.: Red Garage, Colchester. Phone: 592. [1178]

CONSULTING ENGINEERS.

F. G. HERRTAGE, 10 years' practical experience, offers unbiased advice on the purchase of new and second-hand motor cycles; machines examined and reported on; distance no object.—48, Clarendon Rd., Putney, S.W.15. [2693]

INSURANCE.

FOR Insurance of all kinds (specially motor), apply, Ernest J. Bass, Insurance Broker, Bishops Stortford. [0693]

CHEAPEST Motor Cycle Rates. Premiums from 10/-.—F. Payne and Co., Insurance Brokers, 37, Gt. Tower St., E.C.3. [2538]

ROY'S, Ltd.—Motor cycle insurance at Lloyd's. Lowest premiums, payable yearly, quarterly, or monthly. Write for prospectus.—170, Gt. Portland St., London. [7734]

COMPLETE Comprehensive Policies. Motor cycles from 37/6; Morgans, 75/-; immediate repairs permitted.—Wrigleys, Lancashire's Premier Motor Insurance Brokers, The Corner, Houghton St., Southport. [1592]

DREADNOT Motor Cycle Policies at Lloyd's. Premiums from £17/6 per annum, payable yearly, quarterly, or monthly. Before insuring elsewhere, write for prospectus, Roys, Ltd., 170, Gt. Portland St., London. [0994]

"THE Motor Cycle" Insurance Policy (subscribed by Lloyd's Underwriters) covers motor cycle or cycles and sidecars used for private purposes. Complete comprehensive cover. Maximum benefits, minimum rates. Free weekly copy of "The Motor Cycle" to all policy holders paying a premium of £3/7/6 or over.—Full particulars and prospectuses on application, The Manager, "The Motor Cycle" Insurance Department, 20, Tudor St., London, E.C.4. [0995]

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MOTOR Tuition.—The British School of Motoring, Ltd., gives the highest standard of training in driving, mechanism, and repairs for the lowest fees in England. Call, or write for full particulars.—The British School of Motoring, 6, Coventry St., Piccadilly Circus, W. [0953]

SHIPPING.

BUYING and Shipping for Colonial motor and cycle importers.—The best service through Lindner and Co., Ltd., Birmingham. Established 1842. [4577]

SITUATIONS WANTED.

MECHANIC, age 33, seeks situation in London, 16 years' experience, overhauling and demonstrating.—S.S., 79, Hugh St., Victoria, S.W. [2414]

DENOBED Despatch Rider, R.E.'s, requires situation, rider since 1909, 6 years' sales experience, tall, good appearance, age 26.—Box L1,684, c/o The Motor Cycle. [2533]

YOUNG Man, public school education, just demobbed, wishes employment as manager or salesman in light car and motor bike trade, 2 years' pre-war trade experience in London, over 3 years in France with heavy artillery transport.—Box L1,691, c/o The Motor Cycle. [2529]

TO Manufacturers.—Capable Gentleman wishes to get into touch with a go-ahead firm of light car or motor cycle builders to manage agencies and travel the British Isles, or would take sole selling rights on contract, 16 years' experience, and has interest in the retail business, with proved organising and controlling abilities.—Box L512, c/o The Motor Cycle. [7737]

SITUATIONS VACANT.

MECHANIC Wanted, really expert, for complete overhauls, any make of machine, bushing, etc.; permanency if satisfactory.—Apply, stating wages and experience, to Robinson's Garage, Green St., Cambridge. [3002]

WANTED, for Norwood Junction, first-class cycle and motor cycle mechanic, good frame and wheel builder, for general repairs, lengthy pre-war experience essential.—Apply, stating experience and wages required, Box 4,022, c/o The Motor Cycle. [2532]

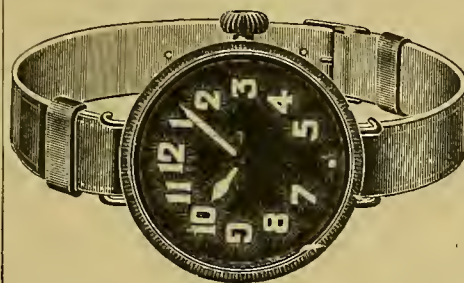
BUSINESSES AND PROPERTY FOR SALE, TO BE LET, OR WANTED.

WANTED, small motor cycle or cycle business, within 30 miles London; price must be moderate.—Box L1,685, c/o The Motor Cycle. [2534]

FOR Sale, splendid motor cycle business, central, and on main road in large south coastal town, agencies; price £400.—Box L1,723, c/o The Motor Cycle. [3020]

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CASE.—Solid Nickel, Screw Back and Bezel, Absolutely Dustproof.

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STRAP.—Solid Pigskin. Wide or Narrow.

DIAL.—Black Luminous with Guarantee of Luminosity. This Watch is luminised in England, and is the most brilliant on the market. The Dial is **REALLY VISIBLE** at night—it gives a light as brilliant as a **SEARCHLIGHT**.

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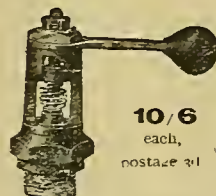
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All Agents can supply it.

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FACTORY Premises offered free of rent for 3 years, 32 miles from London, 3,000ft., with large yard, by a gentleman, practical, with a view to working partnership.—Box L1,643, c/o The Motor Cycle. [2484]

PERSONAL.

MOTOR Cycle, Reg. No. L01143, unless claimed within 14 days, will be sold to pay storage charges, etc.—Webster and Son, Folkestone.

MOTOR Cycle, Reg. No. LP287, unless claimed within 14 days, will be sold to pay storage charges, etc.—Webster and Son, Folkestone.

MOTOR Cycle, L02367, unless claimed within 14 days, will be sold to pay storage charges, etc.—Webster and Son, Folkestone.

CYCLE Car, D5539, unless claimed within 14 days, will be sold to pay storage charges.—Webster and Son, Folkestone. [2439]

HOTELS AND APARTMENTS.

COLWIN Bay, Rhos.—The Towers, Whitehall Rd., 7 doors from Cavay Promenade. Supper, breakfast, garage, 8/6.—Tel.: 233. [6533]

GENERAL TRADE.

WANTED, firms who can undertake the manufacture of quantities of small motor cycle gear parts. Must be first-class workmanship and good deliveries; Birmingham or London district.—Write, Box L1,328, c/o The Motor Cycle. [1393]

LOST AND FOUND.

WILL a client who purchased a motor cycle from Maude's Motor Mart, and at the same time lost a memorandum ring, communicate with the undersigned with a description, when this will be duly handed to him.—Maude's, 100 Gt. Portland St., W.1. [2999]

A WANTED.

SUNBEAMS, Harleys, A.J.S.'s, Eofields, B.S.A.'s, Nortons, Triumphs, Matchless, and Morgans; 1915's and later, purchases for spot cash.—Maude's, 100, Gt. Portland St., London, W.1. [1916]

A AAA.

BRING your machine to us before taking it else where. We will buy for spot cash; highest prices given. Lightweights and twin combinations particularly wanted. Ride up with machine, and walk out with cash.—The H.C. Motor Co., 347, Finchley Rd., N.W.3. Phone: Hampstead 4631. Open Saturday afternoons and Sundays. [5669]

ZENITHS, 90x77 1/2 twins.—Maude's.

3 S.A., 1916, 1917, solo or combinations.—Maude's.

A J.S., 1916, 1917, combinations and lightweight.—Maude's.

ENFIELD 1916 and 1917 Combinations.—Maude's.

DOUGLAS 1915, 1916, and 1917 2 and 3-speed Models.—Maude's.

MATCHLESS 1915, 1916, and 1917 M.A.G.-engineered Combinations.—Maude's.

HARLEY-DAVIDSON 1917 Electric and Standard Combinations.—Maude's.

MORGANS, 1915, 1916, and 1917 water-cooled J.A.P. and M.A.O. models.—Maude's.

TRIUMPHS, 1915, 1916, and 1917 lightweight and countershaft models.—Maude's.

SUNBEAMS, 1915, 1916, 1917, single and twin combinations.—Maude's.

MAUDE'S are buyers of any of the above for spot cash; very highest prices for machines in good condition.—100, Gt. Portland St., London, W.1. [4371]

LEVIS Wanted, good order.—Schafer, Cheadle Heath, Stockport. [X1751]

TRIUMPH Wanted, clutch model.—Schafer, Cheadle Heath, Stockport. [X1752]

SWAN Sidecar, in good condition.—Box 2,755, c/o The Motor Cycle. [X2966]

DOUGLAS Wanted, 1915 or later.—Schafer, Cheadle Heath, Stockport. [X1753]

N.S.U. 2-speed Gear, good condition.—"Vago," 176, High St., Acton. [X2262]

SCOTT Coachbuilt Sidecar.—Madgwick, Biltmore, Hindhead, Surrey. [2604]

TRIUMPH or Douglas, no dealers.—Write, 38, Newstead Rd., Lee, S.E. [2502]

WANTED, sidecar.—Particulars, price, Box L1,722, c/o The Motor Cycle. [3014]

AUTO WHEEL Wanted.—Ernest Alderton, Esq., 426, Strand, Gerrard 1094. [2419]

WANTED, Scott, perfect condition.—Roberts, 10, Gibbins Rd., Bedford. [X2218]

MAGNETO, high or low tension, suit 4 1/2 h.p.—Francis 3, Pellhurst Rd., Ryde. [2753]

DECENT Old Road, about £25.—Letters, 24, Townley Rd., E. Dulwich, S.E. [2893]

BIG End Roller Bearing for 1915 Indian required.—Bunce, Ashbury, Buck. [2430]

WANTED.

- R**OC Gear wanted, with or without controls.—Watson, Garage, Aberlour. [X2428]
- A**.C. Sociable, combination, or solo; £45 or under.—116, Tollington Park, N.4. [X2469]
- R**IGID frame for 1916 Powerplus Indian.—Law, Trinity College, Cambridge [X2072]
- W**ANTED, chain sprocket for Indian back wheel.—Wood, Riverside, Beeding. [X2672]
- G**OOD Levis or Scott; cash.—Write, 69a, Hambalt Rd., Clapham Common, S.W.4. [X2771]
- S**COTT Drip-feed Lubricator, complete with oil pipes.—Joss, 172, Butt Rd., Colchester. [X2434]
- W**ANTED, Biaki carburettors for B.S.A.—60, Orchard St., Weston-super-Mare. [X2295]
- W**ANTED, light coachbuilt body, new or second-hand.—Cross, Agent, Rotherham. [X2615]
- E**NFIELD Combination; good price for smart thorough.—764, Seven Sisters Rd., N.15. [X2787]
- W**ANTED, magneto, suit 2-stroke lightweight.—11 R., 14, Pamburde Rd., Maldon, Essex. [X2755]
- W**ANTED, Combination, about 4h.p.; no dealers.—Write, 9, Earlsall Rd., Eltham, S.E. [X2503]
- F**RAM, spring forks, and tank, or separate.—11, Heather Cottages, Ash Vale, Surrey. [X2412]
- W**ANTED, 2½h.p. P.N. engine.—Southern, 635, Sixth St., Trafford Park, Manchester. [X2354]
- P**ISTONS, connecting rods, and magneto, for 6h.p. J.A.P.—L., 9, Hatchlands Rd., Redhill. [X2734]
- 100** Motor Cycles Wanted, spot cash paid; bring or send. Palmer's Garage, Tooting. [X0917]
- C**ONNECTING Rod, with big end bush, for 1911 Douglas engine.—88, Park Rd., Dulwich. [X2977]
- G**ENTLEMAN wants good motor cycle, under £40.—After 5 p.m., Langley House, Surbiton. [X2655]
- W**ANTED, good motor cycle or combination, spot cash.—C.S., 14, Swaton Rd., Bow, E.3. [X2829]
- N**.S.U. Gear or Philipson, fit Triumph or J.A.P.—Whitler, Francis Terrace, Park Rd., Aston. [X2570]
- S**UNBEAM Combinations; send particulars and price.—Service Co., 292, High Holborn, W.C.1. [X3006]
- A**UTO-WHEEL or J.E.S. Set Wanted.—Llent, Linsell, Rose Cottage, Gunwalloe, Cornwall. [X2357]
- W**ANTED, engine, m.o.i.v., and gear box, for cycle car.—Jones, Jonesboro', Gerrards Cross. [X2580]
- S**OLO or Combination.—Full particulars, lowest price, T.E.D., 44, Aybrook St., Baker St., W.1. [X2959]
- T**WO Chain Wheels and Chain, for cycle car.—Particulars, Ackling, Ironmonger, Abingdon. [X2589]
- W**ANTED, late model T.T. Rover, Philipson, fast, perfect.—Finchett, Glenhorne, Oswestry. [X2479]
- W**ANTED, overhead valve 8h.p. Zenith-Jap, without countershaft.—Openshaw, R.A.F., Grain. [X0848]
- N**.S.U. 2-speed gear, fit B.S.A., perfect condition; offers?—Box 4,003, c/o *The Motor Cycle*. [X2075]
- G**OOD Motor Cycle or Combination for cash.—16, Osten News, Emperor's Gate, Kensington. [X759]
- B**ROUGH or A.B.C. wanted, not earlier than 1915, for cash.—Box L1,646, c/o *The Motor Cycle*. [X2482]
- C**OACHBUILT Sidecar for 3½h.p. P. and M.—Watkins, 118, Tottenhall Rd., Wolverhampton. [X2213]
- W**ANTED, P.M. or Enfield combination.—J. C. Clifford, 14, Harrington St., Regent's Park, N.W.1. [X2404]
- G**OOD Combination, chain drive; £60-£70.—Full particulars, 93, Kildare St., Farnworth, Bolton. [X2214]
- W**ANTED, motor cycle, Morgan, combination, Ford, good price paid.—97, Sheffield Rd., Barnsley. [X1236]
- L**ADY'S Motor Cycle.—Full particulars to Miss K. Whiting, Castlethorpe, Stooey Stratford, Bucks. [X2252]
- E**NFIELD Combination. Send particulars and price.—Service Co., 292, High Holborn, London, W.C.1. [X2888]
- H**ARLEY Combination; send particulars and price.—Service Co., 292, High Holborn, London. [X736]
- W**ANTED, A.C. Sociable, expert trial, reasonable price.—Write S., 21, Kempe Rd., Kilburn. [X2352]
- W**ANTED, front cylinder for 8h.p. J.A.P. engine; good price paid.—17, Abbeydale Rd., Sheffield. [X2897]
- C**OACHBUILT Sidecar complete, suitable 3½h.p.—Bayles, Station Rd., West Auckland, Durham. [X2328]
- W**ANTED, Grand Prix Morgan, must be first-class condition.—Hall, Hope St., Mill Rd., Cambridge. [X2494]
- W**ANTED, twin Solo or Combination for cash.—Particulars, Facey, Hillhead, Colyton, Devon. [X2442]
- W**ANTED, back cylinder and piston for 1915 5.6h.p. Clyno motor cycle.—Noble, 9, Campbell St., Banff. [X2438]
- C**YLINDERS for 5h.p. F.N., plugs at side, or complete engine.—406, Narborough Rd., Leicester. [X2381]
- L**IGHTWEIGHT wanted, or machine and sidecar, good condition.—56, Wellington St., Hertford. [X2506]

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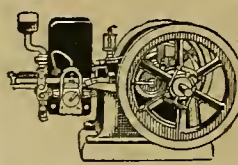
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For Farm or other station
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Magneto ignition. Port-
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Weight 8 cwt. Sent out
complete with petrol tank
and mounted on wood
skids ready for running.

Send for List.
Delivery from Stock.

Booth's Motories, Portland Place, Halifax.

WANTED.

- W**ANTED, N.S.U. gear to suit 3½h.p. Triumph.—McConnell, Butter Market, Warrington. [X2511]
- W**ANTED, 1911 Douglas crankshaft, in good condition.—Yeend, Bath St., Cheltenham, Glos. [X2547]
- D**OUGLAS, 2½h.p., not earlier 1914, no rubbish.—Young, 77, Lower Sloane St., Chelsea, S.W.1. [X2600]
- W**ANTED, Triumph back wheel, clutch model.—Carr, 15, Park Parade, Roker, Sunderland. [X2592]
- W**ANTED, rear cylinder, a.i.v., for 5.6h.p. Rex.—Gale, 13, Torbay St., Kentish Town, N.W.1. [X2669]
- M**ORGAN Runabout, or similar 4-wheeler not objected to.—King, c/o Cornell, 11th St., Ongar. [X2647]
- S**COTT, 1912-14, condition immaterial, also 8h.p. twin engine.—Crabtree, Bridgend, Lancaster. [X2563]
- W**ANTED, Baby Levis, must be in good running order.—Powell, 117, Ashley Down Rd., Bristol. [X2974]
- £**70-£80 for 3-speed 7.9h.p. Indian, Harley, or Henderson.—Full particulars, Box 4,026, c/o *The Motor Cycle*. [X2535]
- W**ANTED, Douglas frame; cheap; send particulars and price.—Miller, 30, Canal St., Bootle, Liverpool. [X2677]
- W**ANTED, large torpedo e.c. sidecar body, or complete, suitable No. 7 Chatter-Lea.—Wynt, Docking. [X2618]
- G**OOD Make Solo Machine, hand-controlled clutch, kick start.—Bailey, 108, Moulsham St., Chelmsford. [X2384]
- M**AGNETO for Douglas, magneto wheel, also carburettor wanted.—Grainger, 7, Bridge Av., Hammer Smith. [X2704]
- S**COTT Combination wanted, not earlier than 1914 no dealers.—Thompson, 103, Honeywall, Stoke-on-Trent. [X2599]
- W**ANTED, T.T. frame and tank for 8h.p. J.A.P. N.U.T. preferred.—Box L1,726, c/o *The Motor Cycle*. [X3017]
- W**ANTED, reliable motor cycle; spot cash; private owner; fullest particulars.—Siggs, Wolverton, Bucks. [X2713]
- W**ANTED, T.T. Triumph, Rex, or Douglas; cash.—Apply, P.T., 67, Erlanger Rd., Newcross Gate, S.E.14. [X2600]
- W**ANTED, kick-starter chain wheel, with catches, Armstrong Mark VI.—Horner, Whitechurch, Salop. [X2260]
- K**ERRY ABINGDON, F.E., clutch, h.b. control, for 4h.p. J.A.P., perfect order; cheap.—Hetherington Moffat. [X2317]
- A**RIEL 5.6h.p. Combination. Send particulars and price.—Service Co., 292, High Holborn, London, W.C.1. [X8889]
- W**ANTED, Cylinder, suit 2½h.p. Zedel, good condition.—Fortune, 2, Reading St., Swindon, Wilts. [X2093]
- W**ANTED, Motor Cycle; also sidecar, coach built, fair condition.—Mansell, Woolthorpe, Grantham. [X2634]
- N**EW Hudson 3½h.p. Oylinder (1912 pattern) wanted.—Write, H., 21, South Lambeth Rd., Vauxhall, S.W.8. [X2361]
- W**ANTED, good motor cycle, lightweight or combination; spot cash.—36, King David Lane, London, E. [X2868]
- 3**1-4h.p. Combination, in good mechanical order, 32 2 or 3-speed.—Wilkins, 23, Fossaway, Midsummer Norton. [X2436]
- W**ANTED, good combination, Enfield preferred; full particulars.—Pianfore King, 3a, Copley Rd., Doncaster. [X8387]
- W**ANTED, magneto and carburettor for Douglas, also saddle.—67, Little Heath, Old Charlton, S.E.7. [X3019]
- 100** Motor Cycles Wanted for cash.—Wandsworth Motor Exchange, Ebner St., Wandsworth (Town Station). [X582]
- £**125 Cash for the best Harley, Enfield, or Sunbeam combination offered.—17, Tamworth Park, Witleham. [X2610]
- W**ANTED, F.N., solo or combination; moderate price; state particulars.—F.E., 26, Ryhall Rd., Stamford. [X2685]
- W**ANTED, 6 or 8h.p. twin engine, magneto and carburettor.—Cameron, 26, Charles St., Bridgeton, Glasgow. [X2320]
- W**ANTED, good class motor cycle and sidecar for cash; no rubbish.—Williams, 137, Wellington Rd., Rybl. [X2528]
- W**ANTED, front cylinder and piston of 1917 Powerplus Indian.—Scrase-Dickins, Heronsghill, Horsham. [X2398]
- W**ANTED, best offer of motor cycle or combination for £50 approval.—Box L1,689, c/o *The Motor Cycle*. (D) [X2616]
- W**ANTED, gear box with clutch, to suit 4h.p. chain-drive Bradbury (or spares).—Forbes, F. Block, Invergordon. [X2541]

EXCHANGE.

6 h.p. A.J.S. Combination, 4 detachable wheels, first-rate order; exchange for G.N., or any good light car of recent date, adjustment either way.—Box L1,636. *See The Motor Cycle.* [2428]

LIGHTING or Charging Set, 2-stroke engine and 35 volt 8 amp. dynamo, tanks, coil, etc., in excellent condition; exchange for motor cycle, or sell.—Particulars, Moore, Homeston, Blantyre, Scotland. [X2212]

1914 B.S.A. T.T. Model, new tyres and belt, perfect condition (£39), for Enfield combination, 1916 up; cash adjustment, or would buy good Enfield combination.—15, Plumstead Rd., Woolwich, S.E.18. [2466]

THE H.C. Motor Co. specialise in exchange deals. We will allow you highest price for your old machine against any other new or second-hand machine in stock; machine bought for spot cash.—The H.C. Motor Co., 347, Finchley Rd., N.W.3. Phone: Hampstead 4631. Open Saturday afternoons and Sundays. [5667]

REPAIRERS.

A.J.S.
A.J.S. Repairs my speciality.—Youngs, 2 and 3, The Parade, High Rd., Kilbarn. [0976]

GEORGE SMITH'S Garage.

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OVERHAULS,

SMALL Repairs,

LARGE Repairs,

EXECUTED with Promptness,

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By Skilled Mechanics.

WE Realise Your Pleasure

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ISTRUCTIONS, 8.30 a.m.—7 p.m.

DEPOSIT: 268, Lavender Hill.

CLAPHAM Junction, S.W.11

GARAGE: Mossbury Rd.,

IN Rear.

PHONE: Battersea 1271. [3032]

WHITTALL Machinists Co., contractors to the War Office, for all motor repairs.—Below.

WHITTALL for Welding.—Experts in aluminium, broken parts reliably welded, accurately machined, promptly returned.—Below.

WHITTALL—Cylinders ground with guaranteed accuracy, pistons fitted; prompt, moderate. New pistons made to pattern or sketch.—Whittall Machinists Co., Whittall St., Birmingham. [0988]

ARMSTRONG Gear Repairs, promptly and efficiently.—Conaty Engineering Co., Honnslow. [7386]

ARMSTRONG or Sturmer-Archer gears or parts wanted.—Marks, 3, Shoe Lane, London. [7748]

ENGINE Repairs.—Write us, Nelson and Hardie, Engineers, Leam St., Leamington Spa. [X2653]

WE specialise in Scott's repairs.—Glaholm and Astbury, 44, Ellison St., Gateshead-on-Tyne. [X0347]

PISTON Rings, high grade; low price, standard or oversize.—Patent Rings, 30, Wigan Rd., Atherton. [6575]

WELDING Broken Cylinders, flanges, combustion heads; immediate attention; reasonable prices.—Below.

WELDING Aluminium Crank Cases, gear boxes, by experts of 11 years' experience.—Below.

CYLINDER Grinding on latest machinery installed since hostilities ceased; accuracy guaranteed; new pistons fitted.—Sadgrove and Co., 140, Conybere St., Birmingham. [X0803]

CENTRAL Motors (Oldham), Ltd., undertake to thoroughly overhaul and repair any make of motor cycle.—Below.

BROKEN Frames, forks, crank cases, connecting rods, pistons, cylinders, etc., etc., welded by the process of oxy-acetylene. Send your enquiries. All work guaranteed.—Below.

WE Repair all makes of gear boxes, N.S.U. gears, etc. All repairs promptly attended to.—185a, Huddersfield Rd., Oldham. [X0390]

ENAMELLING, Plating.—Tanks enamelled as before; handle-bars, etc., plated.—Send to Murray's Plating Works, Union St., Coventry. Platers and enamellers to the trade. [X1841]

DELIVERIES ARE SLOW BUT WILL IMPROVE SHORTLY

Book your orders without delay for the following:

Alldays Allon, Bradbury, Clyno, Calthorpe, Connaught, Humber, Ivy, James, New Imperial, P. & M., Metro Tyler, N.U.T., Rudge, Scott, Wooler, Zenith.

IN STOCK:

ALLDAYS ALLO .. £65 0
IVY TWO-STROKE .. 42 0
RALLY LIGHTWEIGHT and
GRINDLAY SIDECARS.
CAMEO SCREENS.

£5 deposit with order, which will be returned if date is exceeded or at client's option.

COVENTRY MOTOR MART, Ltd.,
London Road, COVENTRY.



ARMSTRONG AND STURMER ARCHER HUB GEARS.

We repair the above gears promptly. Douglas Gear Box Parts in stock. Sturmer Archer Countershaft Gear Box Parts stocked and repaired.

Send wheels and parcels clearly labelled with owners' and our addresses to—

The CROMWELL ENGINEERING CO.,
327, Putney Bridge Road, London, S.W.15
Phone: 1601 Putney.

Also remove all outside axle fittings when sending gears via L. & S.W. Railway, Putney Station.
We do not repair push-cycle gears or supply parts

BEST & CHEAPEST! THE "UNIQUE" ELECTRIC TAIL LAMP CAN BE USED WITH A FLASH-LAMP BATTERY



ASK YOUR DEALER TO FIT YOU ONE, OR APPLY THE MAKERS
M MOLE & SON.
CHARLOTTE ST. BIRMINGHAM.

We are continually having
DELIVERIES
of some of the following Motor Cycles:
B.S.A., Rudge, P. & M., New Hudson, James,
Clyno, Sunbeam, Sun, Velocette, Radco.
Before buying, write
SAM HEARD, LTD.,
50, Higher Eanam, Blackburn

REPAIRERS.

FOR Best Welding Results, Super Welding Co., Gorton St., Greengate, Salford, Manchester. [2332]

DONT Wait, we can undertake repairs, replacements, and overhauls at once, trade or private.—Central Garage, Hounstanton. [3038]

FRAME, chassis, and tank repairs, enamelling and plating, by experts; prompt deliveries.—Langham Co., Fitzroy St., Leicester. [2536]

FOSTER, of 170, Cardigan Rd., Leeds, is again at your service, and can undertake any class of welding and machine work.

CYLINDER Grinding and Piston Making is with us a speciality. We shall be glad to have your enquiries.—Foster, Leeds.

PISTONS.—We specialise in the manufacture of special aluminium alloy pistons, in hundreds of odd ones.—Foster, Leeds. [0310]

PAINTING, body building, conversions, hoods and screens to clients' requirements, quick deliveries; quotations with pleasure.—Palmer's Garage, Tooting. [4571]

FRAME Repairs and Alterations.—Special frames and tanks built, any design; enamelling and plating.—A. Pilkington and Co., 390, Lichfield Rd., Birmingham. [2583]

WELDING.—Broken cylinders, pistons, connecting rods; cylinders reholed, new pistons and rings.—A. Pilkington and Co., 390, Lichfield Rd., Birmingham. [2582]

TANKS Made to Order; alterations, repairs, and re-enamelling; discs for wheels; all work guaranteed.—Phone: 965 Avery's, Gordon St., Coventry. [X1987]

GROVER, Smith, and Willis, Basingstoke.—We do all classes of machining; if you cannot get spare parts send us your enquiry; repairs of every description. [6264]

MOTOR Cycles overhauled, re-enamelling, welding, tyres retreaded, vulcanised; experts in gear repairs.—National Motor Co., 48, Bath Row, Birmingham. [X2608]

TONGE Welding Co., Morton St., Middleton, Manchester.—Again at your service. Send that broken cylinder or crank case. Certain to please you. Quick return. [X2532]

STURMEY or Armstrong Gears and Premier free engine hubs; repairs executed or parts supplied promptly.—The Rotary Jointing Co., Regent St., Warrington. [9447]

MATCHLESS Repairs our speciality; parts supplied; correspondence invited; 20 years' engine experience to help you.—R.P.R. Works, 160, Regent's Park Rd., N.W.1. [2373]

MOTOR Cycles Overhauled Thoroughly, tuning, etc.; speciality, the James, any model; 7 years with the James Co.—Write S. E. Macklow, 95, Baker St., Sparkhill, Birmingham. [X2246]

FOR Quick Repairs, McConnell and Bailey, 232, Rhodeswell Rd., E.14.—General overhauls, spare parts made and fitted to any make motor car or cycle. Established 1906. [1898]

REPAIRS to Motor Cycles; magnetos promptly attended to. Large stock accessories and parts. Dunlop tyres stocked.—The Mart, 151, Caledonian Rd., King's Cross, London. [1588]

BROKEN Parts, frames, forks, cylinders, chassis, carriers, welded and finished immediately. Phone: Hop. 2092.—Universal Welding and Eng. Co., Salisbury St., Bermondsey. (Bus 47). [2432]

GENERAL Machine Parts for cars and cycles, pistons, piston rings, valves; accurate machine work a speciality.—White Bros., 13, Windmill St., Tottenham Court Rd., London, W.1. [1721]

REPAIRS and Overhauls.—Motor cycles, any make; quick, reliable; 18 years' experience.—T. Bueh, 18, Melbourne Grove, East Dulwich, S.E. (Late formao, The Service Co. Garage). [1793]

MOTOR Cycle Overhauls, welding a speciality; repairs to frames, etc., at moderate charges by efficient workmen, 15 years' reputation.—Pioneer Motor Works, 290, High St., Stratford, London, E.15. [2115]

NEW Pistons fitted, also gudgeon pins, bushes, and valves to any make; complete overhauls undertaken; estimates given.—Russell Engineering Co., 57, Trafalgar St., Sheffield. [2105]

WANTED, Harleys, Eoffels, A.J.S., etc., to overhaul, enamel, and plate, turn out as new; combinations from £18, solos £14, replacements extra.—H.T. Motor Co., 21, Monney Rd., N.19. [9681]

B.S.A. Specialists in Repairs and overhauls; replacement parts.—Geo. Smith's Motor Cycle Depot, 268, Lavender Hill (opposite Ardington and Hobbs), Clapham Junction, S.W. Phone: Battersea 1271. [1751]

REPAIRS, Overhauls, Alterations, etc.; engines re-bushed; enamelling and plating; valves for all makes in stock; Ford pistons, complete.—Write, Williams and Harding, Paradise St., Coventry. [X5591]

COVENTRY Motor Mart, Ltd., London Rd., Coventry.—Overhauls and repairs to any make of motor cycle or light car; obsolete parts made and fitted; plating and enamelling; skilled mechanics; prompt attention. [X0612]

STOVE Enamelling, our prices frame, forks, mudguards, stand, carrier, and wheels (black), 25/-; colours, 35/-; sidcar chassis, 14/-; quickest delivery.—Park Motor Works, 1a, Paradise Rd., Green Lanes, Highbury, N.5. [X2196]

REPAIRERS.

ENGINE Overhauls; alterations, repainting, enamelling, plating; spare parts made; new pistons; rings and bushes; expert pre-war mechanics and machinists.—A. and A. Engineering Co. (Prop., O. W. Talbot), 35a, Edward Rd., Balsall Heath, Birmingham. [1842]

ACETYLENE and Electric Weldings.—Broken flanges, cracked water jackets, scored bores, worn bearings, built up; aluminium gear boxes, crank cases, any broken motor part welded and machined up and returned in 7 days, 14 years' experience.—Lincoln Jeffries, jun., Gnn and Motor Maker, 120, Steelhouse Lane, Birmingham. [6764]

ARMSTRONG and Sturmer-Archer 3-speed Hub Gears.—F. E. Jones, Muswell Hill, has given up the repair and supply of replacements for the Armstrong and Sturmer-Archer 3-speed motor cycle hub gear, and the County Cycle and Engineering Co., Staines Rd., Hounslow, have purchased the stock. The County Engineering Co. hold a complete stock of these parts, and can repair these gears at once.—County Engineering Co., Hounslow. [8986]

TENNANT Engineering Co., Pershore St., Birmingham, pre-war engineer motor repairs, now released from Government control, are again able to undertake every description of machining and repairing in connection with motors or other form of traction. Cylinders rebored, new pistons fitted. Engines rebushed, thoroughly overhauled, and restored to highest efficiency. Frames altered and repaired. Welding in any metal by real experts. Prompt delivery. All work fully guaranteed. [X2687]

MISCELLANEOUS.

INDIAN Electric Head and Tail Lamps and horns: 50/.—Wood, Riverside, Beeding. [2673]

DYNAMO, lighting cycle or car: £3/17/6.—Lucas, 84, Upper Ground St., S.E.1. [3030]

PHILIPSON Pulley: 30/.—Smith, 183, Munition Cottages, Foleshill, Coventry. [X2388]

FOR Sale, all parts of 3 1/2 h.p. Triumph.—12, Queen St., Cleaton Moor, Cumberland. [X2566]

N.S.U. Gear, off Precision; £5/10.—E.A., Grove House, Rainbow Hill, Worcester. [X2646]

BANCROFTIAN Co., the most reliable and cheapest house in the United Kingdom.

TYRES.—Don't buy any until you have seen our special list of high-grade clearance tyres at less than half manufacturer's prices. Write for list at once. We have the largest stock of tyres in London.

BELTING.—All best makes in stock at lowest prices. Few short lengths.

WATERPROOF Overalls.—Highest class at practically pre-war prices. Don't buy any until you have seen our list.

MAGNETOS.—In stock, Bosch, Dixie, U.H., etc. Repairs at lowest prices.

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CARBURETTORS and Replacements.—Brown and Barlow, Amac, and Sensprays at lowest prices.

PISTON Rings and Valves.—Pretty well all makes at exceptional prices. Send patterns.

HORNS (new).—Motor cycle, 12/6, latest pattern; mechanical, 21/., 32/6, and 36/.

LAMPS and Generators are a great speciality of ours. Lucas, P. and H. Miller's, F.R.S., and others in stock at lowest manufacturers' prices.

WIND Screens and Aprons in stock. Cameo a speciality. Hoods at low prices.

MOTOR Cycles and Sidecars. Orders taken for all makes; early deliveries. We stock everything for the motorist. Send your enquiries.

BANCROFTIAN Co., 64 and 78 (extension of premises), Bishopsgate, London, E.C. T.A.; Chaikel, London. Tel.: 9897 London Wall. [2989]

BINKS Carburettors.—We specialise in these for any machine.—Booth's Motories, Halifax.

BINKS Carburettors.—Good allowance for your carburettor in exchange.—Booth's Motories, Halifax

BINKS Carburettors.—Run on paraffin or substitute and economise.—Booth's Motories, Halifax.

BINKS Carburettors.—Supplied promptly; old carburettor taken in exchange.—Booth's Motories, Halifax [X5125]

WATFORD Speedometer, 1,100 miles, off Douglas. £2/15.—Babb, South Molton, Devon. [X2642]

STICKY Oilskins easily restored; instruction free.—Vix Company, 22, Newgate St., London. [2763]

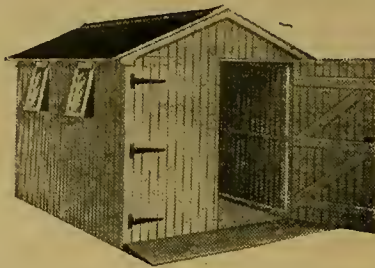
PAIR Douglas Cylinders, 1914, want regrounding: first 20/.—35, Avondale Rd., Southport. [2433]

JONES Speedometer, complete, perfect, for 26in. wheel; £3/10.—Clark, South Witham, Grautham. [X2414]

STEWART Speedometer, 26in. wheel, practically new; 50/.—144, Hamlet Court Rd., Westcliff. [X2275]

TWO Connecting Rods and one piston, for Powerplus India; cheap.—Coope, New Rd., Basingstoke. [2403]

SUTCLIFFE'S MOTOR CYCLE and MOTOR CAR SHED



Length.	Width.	Height to ridge.	Price.	Floor extra.
6ft.	5ft.	6ft.	£ 9 0 0	£2 9 0
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10ft.	7ft.	8ft.	£17 0 0	£5 10 0
11ft.	8ft.	9ft.	£21 10 0	£7 0 0
15ft.	12ft.	10ft.	£36 0 0	£14 0 0
20ft.	12ft.	10ft.	£46 0 0	£18 0 0

All sent carriage paid in sections.

Sutcliffe's Motor Sheds are the strongest built, best designed Motor Sheds you can get at anything like the price; don't be tempted to buy weakly constructed Sheds, they are most expensive in the end. Study Sutcliffe's Construction.—Sides, ends, roofs built on 3-inch best match boards, roof also covered with extra heavy felt, rainproof framework of tremendous strength. All floors are double strength, will carry a ton or more weight easily. All houses erected and bored before despatch, all bolts supplied free. If any client is not perfectly satisfied, simply return shed and we refund purchase price. Full details in free booklet. Can rail any size in 2 to 6 days. F. & H. SUTCLIFFE, 44, Wood Top, Hebden Bridge, Yorks. Phone:—58, Hebden Bridge.

When ordering your new machine, specify

The "ADVANCE" ADJUSTABLE PULLEY.

When having your old machine overhauled, do the same

It is an economical NECESSITY, and always gives satisfaction.

Write for particulars to—

THE ADVANCE MOTOR MFG CO., LTD.,
Kingsthorpe Road,
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Petrol & Oil Tanks



Tanks, any shape, to order. Repairs and re-enamelling from 10/6. Booklet free.



Auxiliary tanks, with filler, tap, T piece, piping, clips, complete, always in stock.

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WE SHALL
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LEEDS.

Meanwhile, all enquiries with regard to New Machines or overhauls, etc., to—

WATTS BROTHERS,
135, Mottram Road, STALYBRIDGE.

MISCELLANEOUS.

COUNTERSHAFT Gear (new), 2-speed, k.s., clutch, A.J.S. type, £10/15.—10, Lincoln St., Birmingham. [X2267]

F.N., 1908, being dismantled, all parts for sale; offers wanted.—The Grange, Rollesby, Norfolk. (D) [2612]

STEWART speedometer trip, 70/.—Avon 650x65, 50/.—C. H. Thomas, St. Bartholomew's Hospital, London. [2481]

SPEEDOMETER, Cowey 26in., perfect, complete; first cheque £3.—Sleath, 408, Wylds Lane, Worcester. [X2609]

PISTON Rings, all sizes, 2/6 each; send pattern.—Geo. Smith's Motor Cycle Depot, Clapham Junction, S.W. [1746]

ELECTRIC Horns, lamps, accumulators, batteries.—Geo. Smith's Motor Cycle Depot, Clapham Junction, S.W. [1748]

RENOLDS Chains, all sizes in stock, for 2 1/2 feet.—Geo. Smith's Motor Cycle Depot, Clapham Junction, S.W. [1749]

NEW Lodge Aero Plus, boxed, as advertised back page "Motor Cycle"; 9/.—Barker, Oxford Rd., Worthing. [X2371]

PHILIPSON Palley, Triumph, £2/7/6; Leamington pillion seat, 12/.—43, Fleetwood Rd., Leicester. [X2565]

MINERVA.—Large stock of spares; no cylinders.—Cookson Bros. and Harrison, Wright St., Old Triford. [X9787]

ONE Gross Bolts, nuts, washers, etc., 2/6; 2 gross, 4/6.—Tallett, 340, Shaftsmoor Lane, Hall Green, Birmingham. [1238]

AMAC Carburettor, perfect order and condition, 27/6; Middlemore saddle, 15/.—36, Townsend Rd., Southall. [2360]

SPEEDOMETER (car), trip, American magnetic, 33in. wheel; £3.—The Nest, Lyoway Lane, Ropley, Hants. [X2356]

FEW 1914 2 1/2 h.p. Douglas Parts, some new; state wants. Also 1911 Bee gear parts.—Motors, 30, Park St., Cardiff. [2730]

50 NUTS, Screws, Washers (assorted), 2/6, 1 set free; send for list.—Eric Meadows, Bankfield Lane, Southport. [8928]

10 FT. 3/4 in. x 5-16 in. Chain, 30/9; chain sprockets for magneto, 2/6.—Gosling, 136, Cauldwell Hall Rd., Ipswich. [X2317]

72 SPRING Washers, 3-16 to 1/2, 1/6; 36 castle nuts, 1/4 to 1/2, 1/6; carriage paid.—Wood, 38, Tithburn St., Preston. [X1714]

STEEL Tubes, round and oval section, various sizes and gauges; several tons for sale.—C., 179, High Rd., Kilburn, N.W.6. [2572]

INDIAN Carburettor, 25/.—Indian Schebler, 35/.—Amac complete, 37/6.—C. Heath, Mayville, Dursley, Gloucestershire. [X2270]

TAIL Lamp 10/. side lamps 42/., pair brand new; goods approval against remittance; post free.—Palmer's Garage, Tooting. [6831]

MOTO-REVE Frame, wheels, tank, bars, and saddle, Druid forks; what offers?—18, Melbourne Grove, East Dulwich. [2995]

WATFORD Speedometer, 26in., complete and perfect, £3/3; Tynesider pillion seat, £1.—230, Archway Rd., Highgate, N.6. [2516]

SMITH'S Speedometer, complete, good order, £3.—Bradbury tank with oil pump, 30/.; Sunbeam front mudguard, 12/6.—Moss, Wem. [X2461]

1914 Binks Carburettor for 2 1/2 h.p. Douglas, only used few weeks, as new; 50/.—Toy, 22, Hazlitt Rd., West Kensington Park, W.14. [2708]

FOR Sale, Claudel Hobson carburettor for 1in. or 1 1/2 in. stub, vertical or horizontal; what offers?—Box 3,071, c/o The Motor Cycle. [X1772]

2 1/2 h.p. Douglas Piston, complete with rings and gudgeon pin, also two adjustable tappets, all brand new; 25/.—Day, Okehampton. [2462]

TRIUMPH pattern Pistons, complete with rings and gudgeon pin, 35/. rings, 2/6; gudgeon pins, 3/6; in stock.—Lifford Accessories Co.

PISTON Rings.—Triumph, Rudge, Precision, Villiers, J.A.P., Sunbeam, James, 2/3 each; Enfield, Douglas, Lewis, 2/—each; in stock.—Lifford Accessories Co.

VALVES, 3/ nickel, nearly all standard patterns in stock, 6/6 each.—Lifford Accessories Co., 10a, Guildhall Buildings, Navigation St., Birmingham. [X2607]

3 h.p. N.S.U. Engine, frame, tank, wheels, forks, coil, and new battery; 47, offers.—J. Cleasby, 72, High St., Bewick Main, Birtley, Co. Durham. [X2468]

K LAXON Motor Cycle Horns, special purchase, 200 on offer; 37/.—each, carriage paid.—Harris, 51, Upton Lane, Forest Gate, London, E.7. [1451]

TRY the Aslatt tyre stopping, the 2 s.d. saver in tyre hills; 1 1/2 per tube, post free.—The Aslatt Co., Midanbury Lane, Birrneton Park, Southampton. [X2516]

INDIAN Touring Bars, £1; Indian kick starter, 10/. 3in. Kempshall tyre and tube, 10/.; electric horn, £1; or £2/10 the lot.—Capt. Hay, Cookham, Berks. [2499]

LAMB'S

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IS ASSURED TO THOSE WHO DEAL WITH US.
OUR STOCK OF MACHINES IS LOW, BUT THE
MECHANICAL CONDITION OF EACH IS RIGHT.

MACHINES AVAILABLE TO-DAY, 28/5/19:

- 1918 ENFIELD Combination.
1917 ENFIELD Combination.
1915 INDIAN 7-9 Comb., spring frame, elec. lighting.
1913 INDIAN 7-9, h.p., two-speed, and Sidecar.
1916 B.S.A. 4½ h.p. and Millford Sidecar.

- 1916 ALLON two-speed.
1914 (late) NEW IMPERIAL two-speed.
1916 SUNBEAM 3½ h.p.
1916 ZENITH-GRADUA 3½ h.p.
1916 B.S.A. All-chain and No. 1 Sidecar.

CYCLE DEPARTMENT.—Our Stock of New Machines comprises B.S.A., ARIEL, RUDGE, and CALTHORPE Cycles from £12 12 0, and many second-hand.

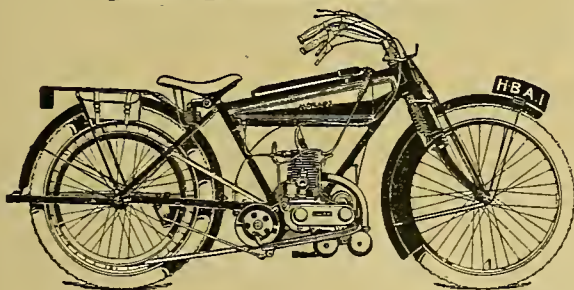
LAMB'S, 151, High St., Walthamstow, & 50, High Rd., Wood Green.

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2½ h.p. LIGHTWEIGHT.

PARTICULARS AND DELIVERY DATES
ON REQUEST.

WE HAVE BEEN MAKING
MOTOR BICYCLES SINCE 1901.

HOBART CYCLE CO. LTD
HOBART WORKS
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A NEW THING IN MOTOR CYCLE MAGNETOS.

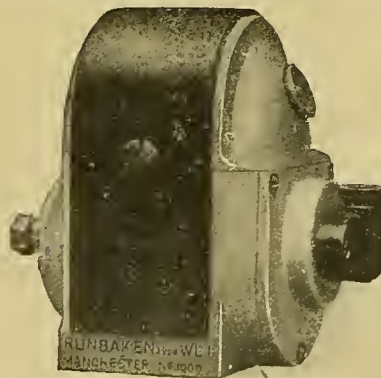
The SIMPLEST and LIGHTEST
High Tension MAGNETO yet produced
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RUNBAKEN
W.L. 1 TYPE MAGNETO.

: WEIGHT ONLY 3lbs. 8 ozs. :

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Finding a Winner.

SINCE competitions have been resumed there has been no general support on the part of manufacturers, but probably we shall see the re-entry of the "trade" rider in some of the important events before the A.C.U. Six Days Trial in September, provided such events offer sufficient inducement for the manufacturer to enter.

There is no doubt that the majority of makers are far from enthusiastic where trials are concerned, and this is not entirely because they are apathetic. Far from it, the average manufacturer realises the importance of competitions as a means to prove the efficiency of his product in public test. But there are indications showing that "the trade" is now loth to spend money and time on trials in which the majority of competitors secure gold medals and the winners of the premier awards are determined by the watch. In other words, to revive the interest of the maker, organisers must make the winning of a trophy or a medal an achievement which will be recognised as something out of the ordinary, and this without imposing conditions upon competitors which are quite irrelevant to the efficiency of the machines and depend solely upon the skill of the riders.

In the future, therefore, it would appear that there will be two kinds of trials—the sporting competition designed to attract the private rider and the more serious event, or real reliability test. No doubt the A.C.U. trials of the future will be on the lines of the latter, and one or two clubs are also seriously considering the elimination in trials of the unpopular secret check and speed-judging competition.

The Knock-out Trial.

It is obvious that such trials must be somewhat arduous, and that survivors will be few, but strenuous conditions are necessary for modern machines. It has been proved by the results of

recent trials that if "reliability" merely means riding to a 20 m.p.h. schedule over almost any class of road, including what would have been regarded as freak hills a few years ago; then there remains nothing to be proved. Most modern machines are capable of doing all that such trials demand of them, and it is only the element of luck causes retirements. But there are points which have not been so fully developed as is possible, and which affect the general efficiency of the machine for utilitarian purposes. These points include improved braking systems, greater flexibility, and the ability to stop and restart under all ordinary touring conditions.

Awards on Merit Only.

The first trial to be organised on the lines we have indicated will be held this month under the auspices of the Midland Cycle and Athletic Club, who are to be congratulated upon their enterprise in an honest endeavour to find a winner for the premier award entirely on points of merit, and we welcome this old club into the field of motor cycle competitions as an organisation more than usually alive to the necessities of the present day. This trial, which is referred to in this issue, is a most ambitious undertaking for a single club successfully to handle, but the enthusiasm displayed by the organisers leaves little doubt as to its success.

It is significant that many members of the "trade" are assisting in organising the trial, which fact reveals the desire of manufacturers to make a trial which will be worth while, and the winning of premier award something of which to be proud.

The competition should attract a large number of trade entrants, as we have never found the manufacturers lacking in confidence when a gruelling test for their machines has been suggested. In addition, the trial will have a strong appeal to the many enthusiastic motor cyclists who usually enter competitions from the sporting point of view.

AN AMERICAN NEWS LETTER.

Trade Governing Competitions. Road Records Barred.

THE Federation of Motor Cyclists, the body which controlled the sporting side of motor cycling in America, has died of dry rot after a spectacular career of sixteen seasons. In its place U.S.A. riders have the Competition Committee of the Motor and Allied Trades' Association. The new body will regulate competition of all sorts in motor cycling, but will not attempt to knit the riders together for social intercourse or to combat adverse legislation.

The M.A.T.A. has ruled that all eight valve and ported motors are barred from mile tracks; that a stock machine is one that may have anything done in the way of tuning, but changing bore, stroke, or compression ratio is barred; that an endurance run is 250 miles long, and that there are no longer amateur and professional riders. American motor cyclists are now novices or experts, with the single exception of a track professional. Once a motor cyclist has ridden for a cash prize he becomes automatically a professional. A novice is a trade or private owner who has never won a leading prize in a motor cycle competition. Riders are classed according to ability and not according to their trade or profession. Thus, a sporting dealer is not made a professional when he competes for the sheer love of the sport. Road record trials are officially taboo.

An Endurance Record.

Roy Artley, of California, recently broke a much coveted record in the West. He drove his Henderson solo mount 394 miles in 13h. 10m., taking 70m. off the old Indian record. Artley broke his forks within sight of his goal, replaced them, and made the reverse trip in record time.

The veteran Baker, one of the best



Scenes at an American hill-climb at Dover, N.J. In America gradients are found which are almost impossible to ascend, and prizes are awarded to those who reach the highest point.

long distance riders (who holds the twenty-four hour track solo record of 1,675 miles), wants to regain his Transcontinental mark and the Three Flag Dash time. These are held by the Henderson and Excelsior, the coast to coast being six days 6h. 16m., while the Three Flag, from Canada to Mexico along the Pacific Coast, is held by Bennett, 70h. or so for 1,600 miles. All but a few hours of that is non-stop, too.

The third annual Capistrano hill-climb in California, by the way, was the most sensational event of its kind in the world, for it is a 500 foot grade with a finishing slant that pokes up toward heaven at the angle of 75%—not estimated, but measured.

The Excelsior repeated its annual victory with a win in the stock class, while the Harley-Davidson broke into the winning column at this hill by capturing

the "free-for-all." The hill requires tractor bands on the rear wheel to aid in making the grade.

In addition to road activity, there is talk of a 250 mile track race at Los Angeles this month; two speedway race meets on the Fourth of July; a 14.5 mile course has been selected for an American Tourist Trophy Race out near Denver, Colo., for sidecars only; and several clubs are bidding for the National Endurance Run Championship.

Clubs are springing up all over the United States, while the dormant organisations are receiving an injection of new life.

And while this is happening among the riders, the factories are far behind in their orders and are getting slower in deliveries daily. Maybe, Ford will bring out that £50 peace chariot of his. Maybe he will; but it does not seem to worry anyone at present.

E. B. HOLTON.

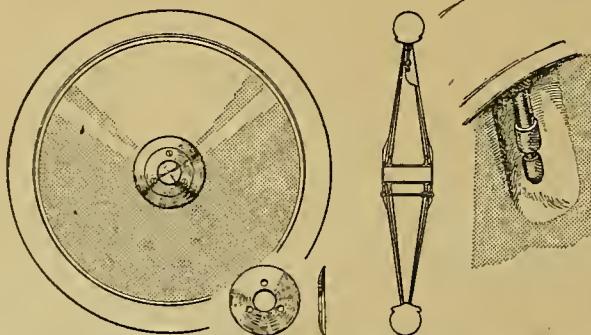
WHEEL DISCS WITH FLANGE FIXING.

THERE is no doubt that wheel discs are increasing in popularity among motor cyclists, as, apart from their eliminating the necessity to clean the spokes, they give a machine a sporting appearance, which, just now, is the "fashion," and likely to remain so for some time to come.

A new wheel disc, which is bound to attract attention, is being offered to the motor cycling public by the Coventry Disc Wheel Co., of Whitefriars Street, Coventry. It is extremely neat, being made without a joint, and the usual method of fixing by nuts and bolts near the periphery is unnecessary.

The disc is cut by machinery and joined by welding, making a perfectly invisible joint, and at the centre there is a brass flange having three holes. The pair

of discs are connected by means of three long $\frac{1}{4}$ in. bolts, which draw the flanges together and so fix the discs firmly against the wheel rims.



The Ace wheel disc, showing the flange fixing and method of pocketing the valve.

Another feature of this disc, which is to be known as the Ace, is the method of exposing the valve. This is shown in one of the illustrations, from which it

will be seen that a recess is provided in one of the discs which pockets the valve in such a way that no gap is left through which dust can permeate.

The manufacturers hope to produce these discs to sell at £1 per wheel set, and intend making a speciality of equipping sidecar outfits. The standard finish will be in black enamelled with plated centre flanges, but colours will be optional, and aluminium discs will also be manufactured.

Mr. E. R. Lloyd, late R.A.S.C., M.T., who, before the war, was with the Singer Co., is manager of the company, which, very shortly, will be in a position to make the discs in quantities.

Occasional Comments

by "Ixion"



How to Avoid Skids.

A CORRESPONDENT of the *Cologne Post* (the paper published for our Army on the Rhine) finds the German roads very provocative of side-slip when wet. He warns fellow despatch riders that the risk of skidding is vastly reduced if the rider puts his whole weight on the footboards when traversing a dangerous patch of road. The sports editor of the said journal takes the opposite view, and informs his correspondent that "the higher the weight on the machine, the less likelihood there is of the wheels slipping" from under the rider. *A fortiori*, if a tennis umpire's scaffold chair were substituted for the ordinary saddle, side-slip would die a natural death. The sports editor should conduct experiments to discover what difference in stability would result if the rider (a) sat on a saddle pin which would raise him 12ft. from the ground line, or (b) stood on the footboards wearing stilts which would hoist his body to a similar height. For me, a wide pair of handle-bars and a saddle well forward are good enough; I like the saddle as low down as I can get it, and I never stand on the footboards except when I see I cannot escape running over a very fat man or at level crossings.

Baking the Sparking Plug.

I WONDER where the Rev. J. M. Philpott picked up his tip of heating the sparking plug to overcome the coyness of a cold engine at starting time. If he has independently re-invented it as a *tour de force*, it may interest him to know that it has long been quite a popular dodge amongst air mechanics. For example, I understand that at the Sunbeam-Coatalen aero engine test shop, it is a routine practice to keep the plugs in special racks and to put each rack into an oven shortly before its engine is due for starting. I should be interested to hear a technician discourse on the exact reason why a hot plug should ensure an easy start from cold, as it always does. It is too remote from the carburetter to affect vaporisation of the complete charge very materially, nor can it raise the temperature of the combustion chamber very appreciably. Are we to understand that a very few degrees of heat make all the difference in a start from cold, or that the bridging of the plug gap by a bead of condensed moisture is commoner than most of us have suspected? At any rate, whatever the reason may be, I can vouch for the soundness of Mr. Philpott's recommendation.

Getting Nearer to It.

I HEARTILY congratulate the Douglas designers on their new $3\frac{1}{2}$ h.p. For one thing, it does not flaunt its springs; a couple of big rear laminateds are a trifle too obtrusive, and are apt to cock up the stern of the machine till it reminds one of the bustle in a mid-Victorian skirt. What is more to the point, the machine is light. It is a fully-sprung $3\frac{1}{2}$ h.p. at roughly two hundredweight. The A.C.U. has very

seldom nerved itself to publish the actual running weights of the machines entered for its trials; but some years ago I concealed my diminutive figure in their scale room, and can testify that in those days the average weight of an unsprung $3\frac{1}{2}$ h.p. with a single gear or variable pulley was over two hundredweight. Since then weights have shown a steady increase, what with spring frames, full chain drive, three and four-speed gear boxes, chain cases, and frames supposed to be sidecar-proof. The new Douglases evidently intend to reverse this deplorable process. There are numerous laudable details in the layout. You get your lamp bracket thrown in instead of having to pay some shark of an accessory dealer half a guinea for a fitting which never blends into the outlines. You cannot mistime your magneto. The piston has definitely broken with the "maximum-friction" type so universal in 1914. Getting the engine out is not comparable with the 500-piece jigsaw puzzles so popular in military hospitals. Mud shielding is not forgotten. The design shows happy co-operation between practical riders and sound engineers.

Service.

IT is an almost incredible fact that the average motor cycle manufacturer arranges no organised local "service" for his customers in England. Until quite recently you could break an exhaust valve of any leading British engine without feeling at all certain that a spare would be obtainable in the next big town. The firm would have an agency in that town, but an "agency" by no means implied a representative stock of spares, *nor does it at this day*. A few makes are in almost universal demand, and in the larger towns a tourist on a sister machine could replace an exhaust valve with tolerable certainty. He could only replace a less vulnerable item, e.g., front wheel spindle, if he had the luck to strike a sensible agent who would remove the required part from a stock or used machine. If the tourist were riding one of the lesser makes of machine, he would not be able to get spares except at the very liveliest and largest agencies. Such business methods are atrocious in the twentieth century. Manufacturers should make it part of their agreement with their "agents" that they maintain a stock of at least one of everything likely to go wrong. I have known an agent refuse to strip a part from a machine in his window to help a stalled tourist along the road. In war, when necessity was our law, the maker of an aero engine was compelled to supply spare parts with each engine delivered, and the kit of spares sometimes amounted in cost and weight to the equivalent of an engine and a half, or even more. I am not implying that a motor cycle engine demands quite such liberal "service" as that; but I note two facts of relevance while I am on this topic.

1. A friend of mine who bought a 1913 Indian

Occasional Comments.—

second-hand the other day has been able to purchase any bits he wanted across the counter at Indian House.

2. One of the mushroom motor cycle syndicates intends to equip all its agencies with a complete kit of spare parts which will not be listed at profiteering prices.

Testing the Compression.

IN the early days of the motor cycling era we used to test engine compression by standing on the pedal and mentally noting how long it took to go down. When advanced design robbed us of pedals, we based our estimates on feeling the back wheel, or on the amount of weight we lost in producing a start. Such rule of thumb methods will not satisfy your *pukka* engineer. Mr. Eustace Thomas, of Manchester, has evolved a childishly simple apparatus for tuning up the compression of his light car. The gadget is of special value where four cylinders are concerned, a single or twin presenting a much easier job; but I describe the instrument in case any fastidious owner is eager to exorcise the tiniest vestige of a leak. The engine is put on the compression stroke, with the compression tap shut, and rubber bungs inserted in the valve ports of the cylinder—i.e., the inlet and exhaust orifices in the head. Pipes threaded through holes in the bungs are suitably bent and led into a vessel containing water, so that the far end of each pipe is under water and beneath an inverted glass bell jar. $\frac{3}{8}$ in. rubber hose is used to couple up the compression tap to an air reservoir, e.g., an old oil tin. This reservoir is provided with a gauge, and is charged with compressed air by a tyre pump, an ordinary tyre valve being used as a non-return. At the commencement of operations the compression tap is shut, and a pressure of, say 50 lb. is pumped up in the reservoir. The compression tap is then opened, and the reduction of pressure down to, say, 25 lb. is timed against the watch, whilst bubbles in the two glass jars show whether there is a leak at either valve, and, if so, whether the leak is great or small. If the external joints, e.g., valve caps, sparking plug, and compression tap, have already been perfected by a series of oil tests, an unusual rate of leakage unaccompanied by bubbles in the glass domes shows that the

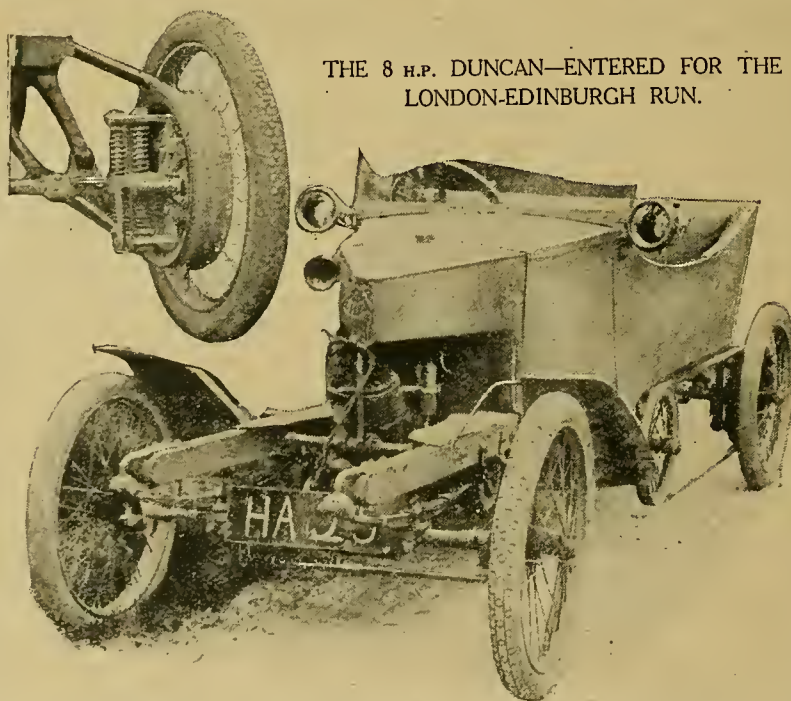
piston rings are faulty. Of course, for real accuracy in using such a gadget the operator requires a standard leakage period to work to; until he knows how long the 25 lb. drop in pressure should take with rings in perfect order, he can only work by his "previous best." Mr. Thomas found the apparatus was a regular eye-opener as to the number and obstinacy of the air leaks in the average engine. An Okill gauge will, of course, register the actual compression or explosion pressures of any given engine; but it cannot betray the exact location of individual leaks, as this home-made gadget will do.

Honesty the Best Policy.

TO judge by the letters I receive, some of the second-hand dealers are sharks. I blame no such concern for charging fancy prices in these days. Materials are up. Labour is up. The staffs have in many cases been fighting for us; often at Tommy's pay, goodwill (if any) has evaporated, and the business has to be re-built from the base. An article is worth what it will fetch, and if there is a slump (and there may be) following on over-production it will not be nice for the agents any more than for the factories. So if an agent asks me a price, provided it is market price, I do not complain that it is perhaps even in excess of what the 'bus cost its last owner but four or six years ago. I myself have probably squeezed my employers for a 100% rise in salary, and got it. But it is bad morals and bad business to sell scrap stuff at any but bargain prices; and to sell dud stuff at gilt-edged prices is a short cut to bankruptcy. Motor cyclists as a class

are loquacious individuals. The average Britisher may not be difficult to "have," but he is not shy of telling all and sundry about it afterwards. The firms who are tempted to adopt these get-rich-quick methods will be the very first to feel the pinch when the struggle between the factories to skim the cream of the market is over. Public opinion cannot be defied with impunity. Already—even after a four and a half years' moratorium—seven riders out of ten will answer promptly if invited to name two or three trustworthy second-hand-specialists; and just as promptly if the request is for a black list of wrong 'uns.

THE 8 H.P. DUNCAN—ENTERED FOR THE LONDON-EDINBURGH RUN.



A "home-built" cycle car, constructed by Mr. A. J. Duncan, a Smethwick dental surgeon, in lieu of motoring during the war. The engine fitted is an 8 h.p. J.A.P., which drives, through a Harley-Davidson three-speed gear box, an adjustable countershaft carrying 14in. pulleys. The final drive is by twin belts to belt rims, also 14in. diameter. The rear wheels, apart from the rear axle, are separately sprung (see inset). Mr. Duncan is an old member of the M.C.C., and so great is his faith in his own creation that he entered the cycle car in the London-Edinburgh twenty-four hours' run at Whitsuntide.

How I Took Up Motor Cycling.

By VETERAN.



The Trials and Tribulations of a Pioneer Motor Cyclist.

I HAVE been a motor cyclist for so many years that my earliest reminiscences are rather hazy. But I am quite clear that we regarded the real pioneer riders as quite unspeakable persons. To begin with, they were obviously crazy—just like a healthy boy who prefers collecting beetles to playing cricket, or a youth of twenty who gets married. Worse than that, they were vulgar. The early motor cycles were quite incredibly dirty; and anyhow engineering was not then regarded as a gentleman's hobby. Still, just for the rag of the thing, we occasionally accepted invitations to joy rides from these low, common fellows. In that Pickwickian sense, I sat on a front driven Werner, a $1\frac{3}{4}$ h.p. Minerva, and sundry trikes which vibrated like growlers driven fast over petrified kidneys, and made a noise which was cross between massed machine guns and a chaff-cutter in delirium. Also on a $3\frac{1}{2}$ h.p. Benz Victoria, which rattled off twelve miles in the first hour and took three days to make the return journey. Again, on a $3\frac{1}{2}$ h.p. De Dion voiturette, bonnetless, one front passenger facing two rear passengers, steered by a handle like a tramcar control, minus any reverse, with a very sensitive contact-breaker apparently located in one of the rear hubs, and never seen without a bicycle secured to the rear panel by a clothesline on the "get-home-somehow" principle. I particularly remember the profound scorn and rage with which the University of Oxford watched J. Van Hooydonk rattle tinnily past Carfax on a $1\frac{3}{4}$ h.p. Phoenix.

The Caprices of Fate.

I wasted some years in this unpardonable mood. At last the caprices of fate stuck me down in a little provincial town, with much leisure and no occupation. In despair, I gave serious attention to billiards. On my nightly tramp to the saloon I passed a cycle shop—now extending tentacles over several counties as a multiple garage. In this cycle shop stood a motor cycle, on which the local cyclists disported themselves after working hours. They were not trusted to try it on the road, and they could not bring themselves to buy it. But the salesman allowed them to caulk and worship it, and to mount it on the stand and try and start it. To my dying day I shall recall that nightly vision of whirling legs swathed in heather stockings, the occasional cough from the exhaust, the heft the pedals administered to the rider when it back fired, and the dripping, puffing faces of the men who had tried and failed. Tiring of billiards, I jettisoned my caste conventions, and tried to buy that machine.

I rejoice that I did not, for it had a flat belt drive to a pulley with the diameter of a thimble: and the district was hilly. But the agent asked £10 more than I had got. With that business acumen which has since made me prosperous, I called on the rival cycle dealer. I represented to him that motors had come to stay. That he must go ahead. That—tell it not to the M.T.A.—he must supply me at trade price. He did so. I wonder if any other motor cycle has ever been sold on such terms, viz.

(1.) The vendor to lend me his head mechanic as escort two evenings a week (the mechanic was a racing cyclist).

(2.) The buyer (myself) to garage the machine at the vendor's, so that he could put it in the window, whenever I was not riding it. (No charge for cleaning.)

I had any amount of trouble with that machine. The mechanic usually accompanied me, and, fortified with beer on the longer jaunts, kept up well. He had one sovereign specific for all loss of power—grind in the float needle. When the machine stopped, he overhauled the near side and I the off, search being our sole principle of diagnosis, and a sound one, as a detached wire was generally the trouble. On the carrier was fastened an oil lamp, as we both feared and respected the carbide lamp, which seldom worked. Finally, the engine melted its inside, and, when it was returned from the works, you could not turn the pulley: probably someone had left a hammer in the crank case, or something of that kind; but, after an acrimonious dispute with the vendor, I transferred to the rival cycle dealer.

He had just got delivery of the first $2\frac{3}{4}$ h.p. Excelsior ever seen in those parts—a machine of extraordinary reliability, and with great hill-climbing powers. It had an 80×80 mm. M.M.C. engine on De Dion lines, and, despite a $\frac{5}{8}$ in. V belt and a $4\frac{1}{4}$ to 1 gear, was a great hill-climber. It stopped a promising boom by the Quadrant firm, being more powerful than a 2 h.p. of that make which Tom Silver was just demonstrating. The Excelsior had been well written up by that versatile genius, E. Douglas Fawcett, novelist, chess player, and philosopher, who later achieved some fame by coaxing a 6 h.p. De Dion car up some of the Swiss mountain tracks. I remember calling to yarn motor cycles with him just as the post came in. His den was stacked with chess boards in layers, on each of which an incomplete game was staged. The mail consisted of postcards on which maestros of all nations reported their next move in correspondence matches. I remember my

How I Took Up Motor Cycling.—

Excelsior for three principal reasons. In the first place, it carried me 15,000 miles with no mentionable trouble; though why the single front forks never collapsed in that period, considering how I rode it, is a mystery. Secondly, it devoured belts at an extraordinary rate. On long trips I carried three: and, as you jointed them with miniature meat-hooks, to shorten them on the road was not jam. For years I bore Lycett's a grudge for a belt they sold me at this time. It had metal eyelets an inch apart, so that when it stretched, you merely chopped off an inch and put the hook in a new hole. I was too green to see that these holes weakened the belt unpardonably, and

presumably Mr. Lycett was also in his salad days. I was so charmed with the easy hooking that I bought six, and, looping three round my tank, started out on a grandiose summer tour of 1,000 miles. After about thirty miles, all three belts had snapped and been shortened, and snapped and been shortened, till none of them would meet round the pulleys. So I fell to splicing, until my belt consisted of some dozen short lengths united by meat-hooks. It kept on snapping, varied by falling off and disintegrating into its component sections. Lycett eventually established an armistice by inventing a new hot stuff belt and giving me two or three.

Believe me—those were stirring times.

Judgment in Advertising.

A few Notes by an Old Hand for those who have Machines to Sell.

MANY people appear to possess an appalling lack of judgment in the wording of their advertisements when they have a second-hand machine for sale, not appearing to realise that the proper stringing together of the announcement is vitally important as to whether or not it will catch the eye of intending purchasers. In reading through the second-hand columns, one advertisement at once appeals as interesting; while a dozen others, though practically on the same lines, are passed by hardly noticed, the only difference in *the one* and all the rest being probably in the wording. It strikes you as being open, concise, and as telling you just what you want to know.

Sometimes the most essential points are left out entirely—as, for instance, the year of manufacture of the machine advertised. No more fatal omission could be made, and personally I should never dream of writing to an advertiser who omits to name the date.

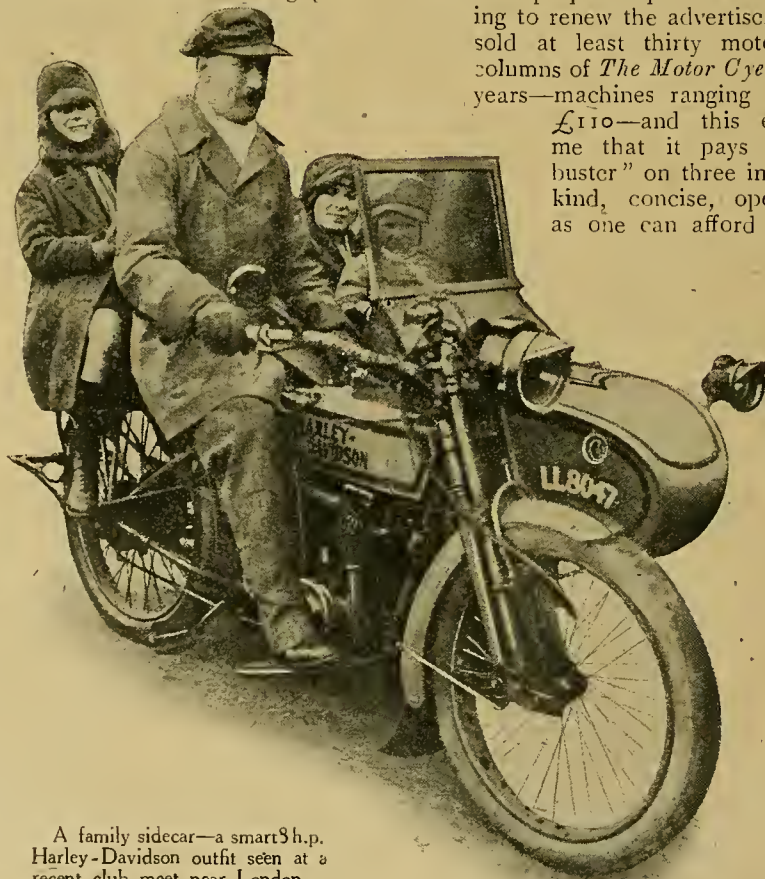
Other advertisers waste valuable words, such as "Enfield two-speed gear, clutch," or "P. and M. chain drive two-speed," or "1914 Scott two-stroke," and so on. "Enfield gear" would be quite enough, P. and M.'s have made only one type of machine, and every Scott has

been a two-stroke. Better far to cut out this superfluous wording—for the man who really wants a Scott or a P. and M. or an Enfield knows the fundamental features of the machine—and state instead the condition of tyres, cycle parts, mileage, equipment, and so on.

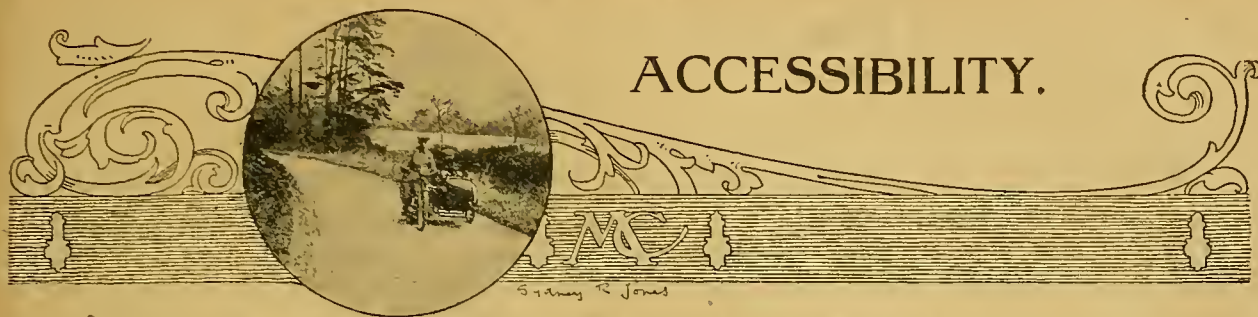
Skimpily worded advertisements such as "1914 Douglas, two-speed, £45, no offers," do not pay. It is far more profitable to go the whole hog, spend a shilling or two more on the advertisement, and make sure of a proper response first time—rather than having to renew the advertisement, I suppose I have sold at least thirty motor cycles through the columns of *The Motor Cycle* during the last twelve years—machines ranging in value from £20 to £110—and this experience has taught me that it pays every time to "go a buster" on three inserts of a good lengthy kind, concise, open, and as exhaustive as one can afford to be.

Details as to equipment, spares, mileage, the make of sidecar, if a sidecar outfit; in fact, everything that the buyer of a second-hand motor cycle requires to know should also be included.

It is not a bad plan even to quote the engine number in addition to the date, in which case the reader cannot get away from the fact that you are acting genuinely with him, and having drafted out your announcement, concisely but fully, add your rock bottom price and "no offers." CHINOOK.



A family sidecar—a smart 9 h.p. Harley-Davidson outfit seen at a recent club meet near London.



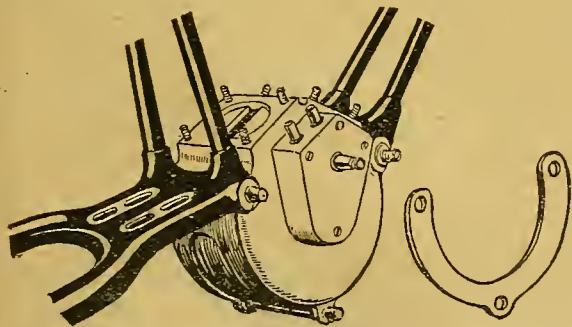
Some Criticisms of Present-day Designs and Constructive Suggestions.

MUCH has been written in the past of accessibility, but at the moment one does not hear quite so much of this very desirable feature.

Now the modern motor cycle is a great advance on that of, say, ten years ago, and, all things considered, is of great reliability. Yet there comes a time when the best mount needs an overhaul, or at least adjustment. When that time comes I wonder what the owners of many of the best known makes of twin and even singles will do. Many will send their machines to the makers or to the local garage, but there will always be a great number who will do their own tinkering, and it is the latter who have my earnest sympathy.

An Opposed Twin Criticised.

The other day I had occasion to decarbonise the engine of a modern $3\frac{1}{2}$ h.p. flat twin, and in order to do this I was actually obliged to take the engine out of the frame. Nor was this all, for one of the tappet guides had to be removed before I could get at the cylinder holding-down bolt.



A suggested method of engine suspension, the small sketch showing the detachable side plate, the removal of which would enable the engine to be withdrawn from one side.

While I had the engine out I thought I would examine the big end bushes: These I discovered so cunningly concealed in the one-piece crank case that it was only with the utmost difficulty that I succeeded in taking them down and assembling them again. Now this engine is quite a pretty piece of work in all other respects, and I positively admire the outside key or dog type of drive to the magneto; it is of the high efficiency type and has a wonderful turn of speed, and has done everything asked of it during my ownership, yet it falls short in the vital matter of accessibility.

I do not wish a wrong construction to be placed on the meaning of these remarks, which, of course, do not apply to all flat twins, some of which are wonderfully

accessible, notably the Douglas, which has earned world fame for its all-round handiness. I merely wish to point out how excellent ideas can be spoilt by lack of care and thoughtfulness in design.

Detachable cylinder heads have always appealed to me as making for far greater accessibility than ever obtains in the majority of engines. Their success in the car world, notably on the Ford, has probably done more to popularise that particular machine than any other point of technical advantage.

In the motor cycle world the proved success of three notable examples—A.J.S., Blackburne, and Bradbury—should surely banish doubt and lead to a more widespread adoption by the makers of other famous machines.

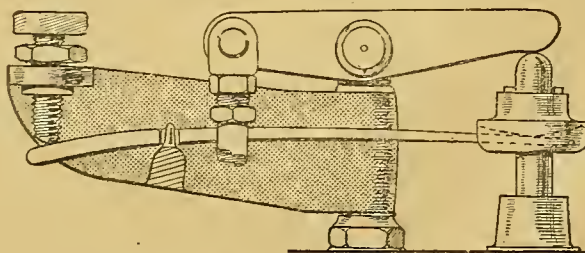
Overhead Valves.

While talking of cylinders I frequently wonder why so many of the makers of overhead valve engines still make it necessary to remove the cylinder in order to take out a valve. With the detachable head again this trouble is done away with, but to those who are not blessed with this convenience it must always remain a problem why a detachable cage comprising valve and seating in one unit such as is fitted to the M.A.G., Rudge, and many aero engines is not more extensively used.

Why Not Flat Valve Springs.

Valve springs have always been fiendish things to fit without a proper tool, and are in the majority of cases without adjustment. Given the Lanchester type of flat leaf spring, it would be a simple matter not only to facilitate fitting, but also to introduce adjustability. However, the spiral spring is very neat and—when in position—unobtrusive, so I suppose it will stay, but while it stays it would certainly be a great convenience if all makers of machines using valve springs would provide a device such as is included in the tool kit of the Triumph—namely, a spring cage.

Frame design has undergone some changes, but remains essentially the same except in one or two cases. Even so, the removal of a modern 6 or 8 h.p. V twin



A method of using a flat spring for an overhead valve.

Accessibility.—

from the frame necessitates quite a lot of trouble that should not be necessary. It is surprising that the loop type of frame has not found greater favour. An application of the loop frame might easily be made to incorporate a cradle with a detachable side plate, thus enabling the engine to be drawn out from one side.

Quickly Detachable Wheels.

Countershaft gear boxes have done much to make things easier for those formerly afflicted with hub gears, at any rate when punctures occur. The knock-out type of spindle fitted to several chain-driven

machines makes for greater accessibility. There will probably be some one asking, "What about the expense?" and I must admit I have not considered cost of production in these remarks. However, true economy often looks expensive at first.

Still, we have heard so much of a cheaper production by firms specialising on one or perhaps two models that surely we may hope that the final plans laid down for their design will incorporate not only further points of refinement, but altogether eliminate the undesirable features of the pre-war era, and thus enable the British motor cycle to maintain its position as the world's leader.

DOUGLAS B. McQUEEN.

CLUBS AND TRIALS.

BY AN OLD COMPETITION RIDER.

ONCE again clubs and their secretaries are busy with their competition programmes, and many particulars have appeared in print of proposed open events. First and foremost I suppose is the proposed A.C.U. Six Days Reliability Trial, the date for which is September 15th to 20th. It is to be regretted that so far we see no announcement of breaking away from the old "groove" of the "out and home" reliability trial; surely the motor cycle, from a test point of view, is past this stage and deserves something more "brainy" and intellectual.

I would ask clubs whether they consider that manufacturers will continue to support these trials unless new ideas are incorporated which will cause public interest in their machines and at the same time be instructive to public and manufacturer alike?

To make a reliability trial simply a test between "watches" is simply farcical. Could anything be more unfair to the manufacturer than to determine the best machine by the seconds hand of a watch?

A Suggestion.

Trials with non-stop sections, freak hills, and bad road surface conditions are equally unfair, as they resolve themselves very often into physical tests, and the elements of luck and strength of rider have far too great a prominence.

The field is a very large one for instructive trials. A few which come to my mind at present are:

- (1.) Hill-climbing with flexibility tests.
- (2.) Acceleration tests.
- (3.) Traffic driving tests.
- (4.) Accessibility.
- (5.) Mudguarding.
- (6.) Lamp, tyre, and non-skid tests.
- (7.) Fuel tests.

Also, why not a test for one-lever carburettors? These would instruct and interest the rider and manufacturer alike.

I have before me at the moment particulars of a trial, which was carried out by the Streatham and District Motor Cycle Club in November, 1913, called an "Open Touring Trial," which included tests in reliability, speed, acceleration, and stopping and starting on a hill, and the 'judges' report and published results were a mine of information and one of the most interesting documents issued by a club which I have ever read. That trial, in my opinion, was a step in the right direction, but even that is not finality in

what might be done in trials of an instructive and interesting nature.

Individual A.C.U. Trials.

There is a type of trial I should like to see carried out in greater numbers than heretofore, and that is the "individual" trial under the rules and observation of the A.C.U., which admits personal observation throughout the trial, and the A.C.U. might make more generally known their willingness to observe these trials.

Unless we can obviate the overlapping and similarity of trials, I am afraid manufacturers will begin seriously to think of the cost; therefore let us devise means to prevent this eventuality.

I think we realise and recognise that much gratitude is due to manufacturers for their past support of our trials and the generous manner in which they have contributed, in many instances, to our prize lists.

Let us prove to them that we are really alive to their interests, and then I am sure they will not fail us.

My final word is, do not ask too much of them this year, but let us concentrate our energies and brains in devising means and ways to interest them in our trials and competitions, to our own and their benefit for future years.



An ex-P. and M. rider, W. Pratt, who was badly wounded eighteen months ago, astride our photographer's Matchless. Pratt still has to use crutches, and it is highly improbable that he will appear in competition this year.

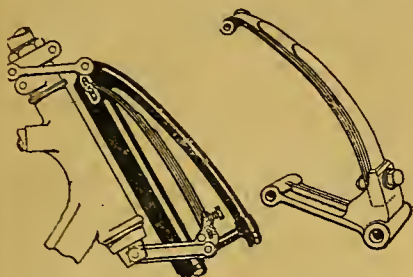


RECENT PATENTS.

REVIEWED BY B. H. DAVIES.



OF the making of spring forks there is no end, but the Royal Ruby latest, in one of its applications, looks rather nice. As the illustration shows, it consists of a modification of the Druid type, in which the fork is hinged to the steering head by two pairs of side links. Under the Ruby patent a third link is

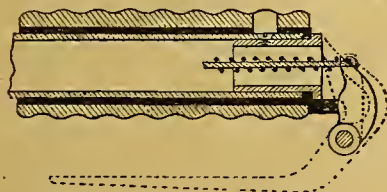


Rigby's spring fork. No. 123,859. 26/3/18.

placed between the lower pair and is utilised as the cantilever of a spring, preferably of the laminated pattern. This leaf spring may either lie in the line of the fork (which makes a very neat job) or be approximately horizontal. Mr. Rigby states in his claim that the side links of the ordinary four-link fork often break, and that the additional link enables the machine to be ridden home after such contretemps. I have not personally struck a broken side link.

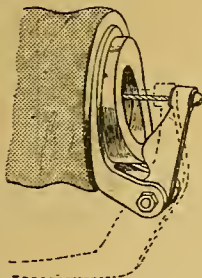
Compound Handle-bar Control.

Mr. Fisker, of Copenhagen, has protected a compound type of handle-bar control, embodying the usual inverted lever and a special form of twisting grip.



Fisker's handle-bar control No. 123,901. 21/5/18.

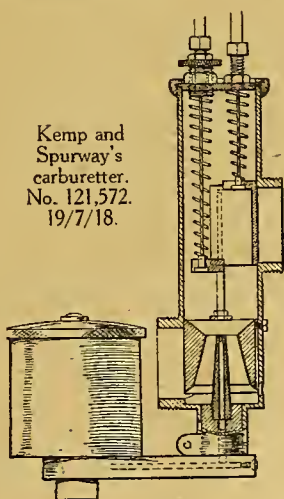
The end of a Bowden wire is secured to a tiny lever pivoted on a lug formed on a sleeve fixed in the end of the bar. The twisting grip contains a sleeve, the outer end of which is extended to form a cam; as the grip is twisted, the cam operates the lever and tightens or relaxes the wire. By a suitable arrangement of cams two wires can be operated by one twisting grip. The combination is quite neat, but the leverage and range of movement afforded are not excessive.



A Simple Carburetter.

Messrs. Kemp and Spurway have evolved a simple carburetter which is fundamentally of the two-lever type, but can be adjusted to a fair degree of automaticity. It is of the vertical type with a side gas outlet to the engine controlled by a piston throttle, and its main interest lies in the air control. The air intake is situated on one side of the base of the jet chamber; the air control piston is machined out internally to form the choke tube, and surrounds the jet. The entire air supply thus passes up round the jet. The choke tube is coupled by a side-stalk, bridge piece, and Bowden wire to the second lever on the handle-bar. As the lever is "opened," the strength of the depression and the point of maximum depression in the spraying chamber are both varied. Very strong suction is obtained for starting purposes with the choke tube in its lowest position, and by suitable contouring of the choke passage any desired correction for high speeds

Kemp and Spurway's carburetter. No. 121,572. 19/7/18.

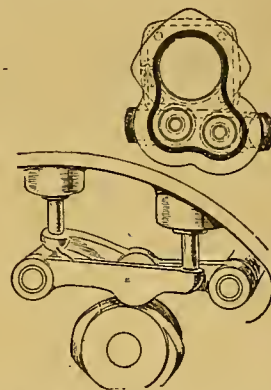


can be obtained. At the same time provision is made for the choke tube to rise and fall automatically in response to engine suction. The choke tube is made very light, and would naturally respond to engine suction unless the coiled spring surrounding its control wire were stiff enough to repress it. As the choke tube is light, a light spring can be used; and the tension of this spring can be adjusted from outside the carburetter by a milled-headed sleeve.

Valve Operating Mechanism.

The James Co. have produced a neat mechanism for operating side valves in a single or twin. They state in their claim that on the ordinary side valve engine, the valves are mounted in the same plane, but the cams in two different planes, so that cranked tappet levers are often necessary, and bent levers are expensive to make and liable to fracture. As the

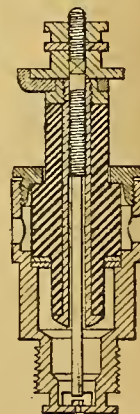
sketch shows, their device overcomes all these snags: but its main value may be that it sets the exhaust valve further out than the inlet valve, and simplifies the task of dissipating the exhaust heat into the atmosphere, instead of conducting it back into the cylinder head, where it is usually answerable for a hot spot and consequent distortion.



The James valve mechanism. No. 123,800. 28/2/18.

Sparking Plug with Adjustable Gap.

Messrs. Kent and Martin have devised a sparking plug with two features of interest. In the first place, the central electrode screws up and down in a threaded bush, inserted down the centre of the electrode. A marked disc and pointer below the milled head of the electrode show what size of gap is in operation, as the central electrode is screwed towards, or away from, the fixed sparking point. Secondly, the metal body of the plug is perforated to admit cooling air to an annular recess surrounding the insulator. Such a plug will make good if or when it is as well insulated as a non-adjustable type, and proves as compression-tight in prolonged use. I have tested several such patents on the road. In most cases the insulator began to leak or the charge to "blow," or the adjustment to jam, before I had made up my mind whether the adjustable gap was of much practical use. In the plug under notice, there are obvious possibilities of variable expansion, of gas leaks up the thread of the electrode, followed by carbon jamming the threads. Nothing short of actual test can determine its value. The inventors have presumably verified these points before sinking money on their notion.



Kent's sparking plug. Pat. No. 122,865. 2/1/18.

A HETERODOX RUNABOUT.

A Newcomer with Several Novel Features to be Marketed by a Large Engineering Firm in the Midlands.

JUST as, a few years ago, it was hard to draw the lines of demarcation between the cycle car and the light car, and the latter and its larger sister, it is almost as difficult to-day to define some of the new designs which are about to be introduced to the public.

It is an open question whether the local taxation authorities will consider a "three-wheeler" with twin rear wheel a four-wheeler or not, but if these twin wheels are built up as one, probably such a machine could, with justice, be claimed to be a three-wheeler.

On the other hand, a vehicle having two separate rear wheels placed close together is so near being both a three and a four-wheeler, it is hard to designate its type.



The Ashton-Evens runabout, having rear wheels eight inches apart, giving the appearance of a three-wheeler.

The Ashton-Evens design, which we illustrate on this page, is in this category, but since its proposed price is in the neighbourhood of many of the new three-wheelers which will shortly be on the market, and also because motor cycle practice exists at certain points, it will interest those of our readers to whom the three-wheeler appeals.

Two Rear Wheels Eight Inches Apart.

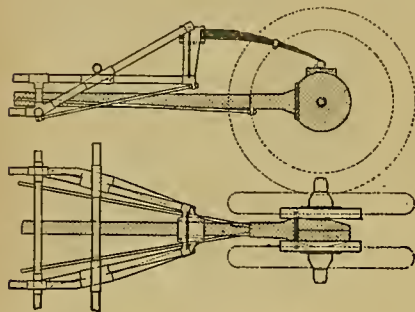
Two rear wheels, 8in. apart, form a noticeable feature of the design. The wheels are supported on short axles, and, therefore, practically as accessible as any wheel on a four-wheeler.

A central cardan-shaft drive is carried to a bevel between the two wheels, three

speeds and reverse being provided by a car type gear box of extremely neat design. Also between the rear wheels is carried the single quarter elliptic leaf spring which constitutes the rear springing.

The frame is of tubular construction of trussed design, and a motor cycle type V twin engine is being considered as the power unit, but more probably a four-cylinder water-cooled may be decided upon.

With a wheelbase of 8ft., and an engine developing 15 h.p., the weight is under 12 cwt. The price has not yet been decided, but Ashton-Evens Motors, Ltd., hope to be able to market the car at a figure in the neighbourhood of £200.



The arrangement of rear framework and transmission.

THE FALLOLITE LAMP.

A Successful Adaptation of the "Limelight" Principle to Motor Cycle Requirements.

IT is more than five years ago that we dealt with the Fallolite lamp in *The Motor Cycle*. It was just beginning to attain a certain amount of popularity among motor cyclists when the war broke out, and the production of Fallolite lamps for private uses ceased.

In the lamp under consideration there are two distinct departures from standard practice. The first of these is in the design of the burner, which practically amounts to an incandescent burner adapted to the use of acetylene gas; and

by the use of a dissolved acetylene cylinder.

The burner is of the Bunsen variety, and admits a tiny jet of gas together with a large proportion of air through the nozzle. At the base of the nozzle is fixed a small holder for the purpose of carrying the wire on which the pastille, composed of rare earths, is fixed. Almost immediately after lighting the lamp the pastille becomes incandescent, and a very powerful light is given off. This burner, the makers claim, is eight times more efficient than an ordinary burner. There is no doubt that it gives a better light and is more economical than the ordinary type, as its consumption is one-third of that of the usual acetylene lamp. Moreover, the light is perfectly steady.

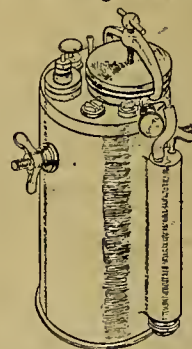
An Adjustable Beam.

The Fallolite lamp has another advantage: there is absolutely no glare unless one directly faces the lamp, as the back of the pastille is quite "dead." Since the burner slides through the centre of the mirror, the focus can be conveniently adjusted so as to give either a narrow beam, penetrating far ahead, or a wide beam. It is also claimed that the colour of the light is such that it enables objects to stand out in their natural

colours—a fact which renders the Fallolite very effective in penetrating fog.

The latest type of Fallolite generator is an ingenious and well constructed article. The gas supply is absolutely automatic, and, once full, the generator can be lit or relit without waste until the carbide is completely exhausted. When out of use the generator is perfectly gas-tight, and from the time the flame is extinguished there is no smell.

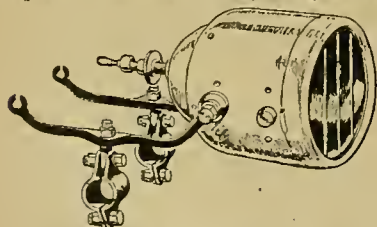
The lamp and generator are made by Fallolite, Ltd., 27, Noel Street, London, W.1.



The generator used with the Fallolite lamps.

CHEAPER MOTOR FUEL.

The next of the series of public meetings being held by the Automobile Association in connection with its motor fuel campaign will be held to-day at York in the Assembly Rooms, at 3 p.m. Local motorists are strongly urged to attend.



The Fallolite motor cycle head lamp.

the second is in the design of the generator, in which considerable ingenuity is displayed. Of course, it is not necessary to use a container at all, but gas must be supplied to the burner under slight pressure, and this can be obtained

CURRENT CHAT

Times to Light Lamps.

SUMMER TIME.

June 12th	...	...	9.47 p.m.
" 14th	...	...	9.49 "
" 16th	...	...	9.50 "
" 18th	...	...	9.52 "

Dangerous.

Our attention has been called to the very dangerous condition of the canal bridge at Sankey Bridges, Warrington.

Ariel Prices Up.

Owing to the continued advances in cost of production the Ariel Co. advise us that on and after the 11th inst. their prices for Ariel motor cycles will be advanced to £90 for the 3½ h.p. counter-shaft model, £105 for the 6-7 h.p., and £30 for the sidecar.

Passenger Machine Trial.

The Birmingham Motor Cycle Club is making arrangements to hold an open trial on July 19th for passenger machines only.

The course will be in the Midlands, but over entirely new ground. The awards will be as follows: Premier award, the Midland cup; first awards, gold medals; second awards, silver medals.

The entry fees will be £1 1s. for non-members, and 10s. 6d. for members. Further particulars will be issued later. Application for membership should be made at once to the hon. sec., Mr. W. H. Egginton, 76, Earlsbury Gardens, Birchfield, Birmingham.

The Bristol Rally.

As announced in last week's issue of *The Motor Cycle*, the Bristol Motor Cycle Club, at the request of the Auto Cycle Union, are organising a West of England rally for individual members of the Union, or members of affiliated clubs, for Saturday, the 21st inst. The General Committee of the A.C.U. meet at the Grand Hotel, Bristol, on the day previous, and it is intended to commemorate their visit by a big Bristol motor cycle meet, the organisation of which is in the capable hands of Messrs. S. L. Bailey, Tozer, and Cates, of the Bristol M.C.C.

The programme up to the present is by no means complete, but a very interesting afternoon is promised to those who can find time to make the journey. Already one of the finest bands in Bristol has been engaged, and Lady Smyth has kindly loaned the beautiful grounds of Ashton Court for the picnic.

The grounds are a haven of beauty, away from the hustle and bustle of the busy city of Bristol. The route, which will be arrowed for the convenience of visitors, abounds in magnificent views, from densely wooded promenades to abrupt chasms of colour—deep ravines of shrubbery, bordering the banks of the Avon, winding like a huge brown serpent 300ft. below. Apart from its magnificent scenery, there is much more to commend the route, as many spots and landmarks within handy distance are of more than passing interest. A brief historical review will be included in the souvenir programme, which is being prepared.

Special Features.

HOW I TOOK UP MOTOR CYCLING.

ACCESSIBILITY.

LONDON-EDINBURGH RUN.

Amongst the sports items will be events for ladies as well as gentlemen, full particulars of which will be announced later.

Bristol riders evidently mean royally to welcome motor cyclists to their city, and those who take advantage of the invitation are assured a pleasant and interesting time. Members of the A.C.U. who have not yet visited the West of England will find the trip quite worth while.

THE MOTOR CYCLE

SUMMER NUMBER NEXT THURSDAY,

Will contain many SPECIAL ARTICLES of interest to all motor cyclists, including

WHERE TO GO FOR THE SUMMER TOUR

Written by motor cyclists familiar with the districts they describe.

A REVIEW OF DESIGN IN 1919.

THE FAMILY SIDECAR.

The most popular vehicle on the road, and why.

THE YOUTHFUL MOTOR CYCLIST.

Why the motor cycle appeals to the young man.

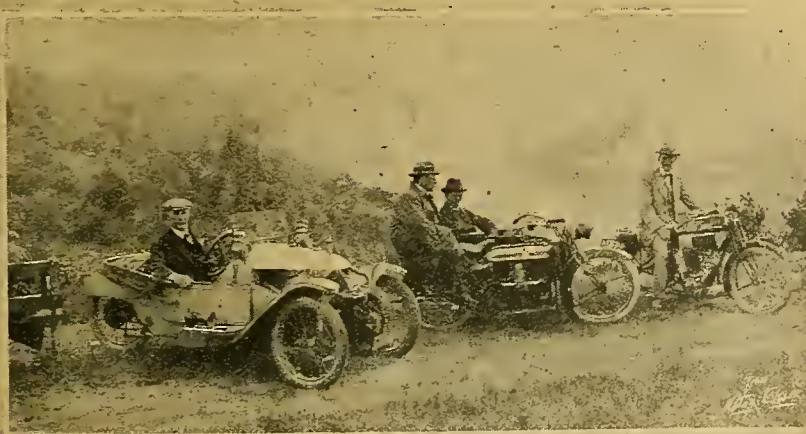
NO AGE LIMIT.

The motor cycle as a suitable mount for the man of mature years.

The usual popular features of "The Motor Cycle" will be retained.

King's Birthday Honours.

Hearty congratulations to Capt. C. T. Newsome, R.A.S.C., on being awarded the O.B.E. (Military Division). Before the war, Capt. Newsome was a Rover exponent in trials and T.T. Races. Other motor cyclists mentioned on the list published on the King's Birthday are Motor Cyclist Cpl. G. Halliday, 3rd Division, Signal Company, R.E., who has been awarded the Distinguished Conduct Medal; Capt. A. J. O. Henrey, and Lt. W. J. Houghton, who have received the M.B.E. (Military Division), both of the South African Motor Cyclists' Corps. Maj. A. J. Palmer, late assistant cashier of *The Motor Cycle*, and who joined the Motor Machine Gun Corps through *The Motor Cycle*, has also been awarded the O.B.E.



The organisers of the Bristol Rally on the 21st inst. Seated in the Morgan is Mr. Cates, on the carrier of the machine Mr. S. L. Bailey, and in the sidecar Mr. Smith, the secretary of the Bristol club. The solo rider is Mr. Tozer.

Next Week!

The Motor Cycle Summer Number, which will be an enlarged issue.

Brooklands.

In conversation with Col. Lindsay Lloyd last week, we were assured that there was no possibility of Brooklands race meetings being organised this year owing to the state of the track.

Police take to Motoring.

A reader advises us that on the Manchester-Chester road the police recently used a Ford car to chase a motor cyclist, whom they considered was exceeding the speed limit. We wonder whether the Ford won the race, and, if so, whether the policemen were not liable to be prosecuted for exceeding the speed of their victim.

A £100 Cycle Car!

We have heard of a new cycle car which is to be placed on the market in the autumn of the present year. The specification includes 8 h.p. V twin engine (water-cooled), stamped sheet metal two-seated torpedo body, bucket seats, four disc wheels, shaft transmission, and three-speed and reverse gear box. The car is said to be entirely British built, and is to be produced in quantities with every part catalogued and interchangeable, and will be ready by autumn. The proposed price is £100, but £80 is mentioned as the ultimate figure when production is in full swing.

The Birmingham-Land's End Trial.

Fifty entrants started in brilliant weather for the Birmingham M.C.C. Trial to Land's End last Saturday. The roads were good as far as Minehead, where there was a time check, after which the competitors had to climb the notorious Porlock Hill on the way to Lynmouth. The route then included Lynton Hill, and continued *via* Loxhore and Barnstaple to Penzance. Many failures among the lightweights were attributed to the bad state of the roads, which were in great contrast to the first part of the journey.

Among those who made good ascents of Porlock were Kickham (Sunbeam), Baker (B.S.A.), Stevens (James), Newey (Ariel), and Kuhn (Levis).

Duke (Triumph) was the first competitor to reach Penzance, Baker following.

The following completed the outward journey: R. W. Duke (4 h.p. Triumph), G. A. Dalby (4 h.p. Triumph), G. A. Dingle (Triumph), H. Poole (A.J.S.), H. C. Heath (2½ h.p. A.J.S.), H. B. Dealey (Morgan), F. W. Giles (6 h.p. A.J.S.), T. Stevens (4½ h.p. James sc.), L. Clark (5.6 h.p. James sc.), J. C. Greenwood (8 h.p. Sunbeam), E. W. Choldercroft (4 h.p. A.J.S.), — Baynton (5.6 h.p. James), E. Kipbee (4 h.p. Triumph), L. Devey (4½ h.p. Ariel sc.), H. D. Meade (2½ h.p. N.U.T.), T. Pollock (5.6 h.p. James sc.), F. J. Watson (3½ h.p. Ariel sc.), E. Kickham (3½ h.p. Sunbeam), C. Harkwright (2½ h.p. New Imperial), A. H. Johnson (2½ h.p. Allon), G. Kuhn (2½ h.p. Levis), H. R. Fowler (5.6 h.p. James), H. P. Cutler (4 h.p. Norton sc.), and R. W. Vaughan (5.6 h.p. James sc.).

Mr. T. Silver checked the competitors in at Penzance and restarted them on the return journey at 4 a.m. last Tuesday.

Name and Address Wanted.

The Editor will be pleased if "Interested" will communicate with him, sending name and address. Correspondence will be treated with strictest confidence.

Motor Legislation.

The Automobile Association includes in its membership a very large proportion of the members of both Houses of Parliament. In connection with its opposition to the Transport Bill, and its campaign for the reapplication of the revenue from motor taxation to road maintenance and improvement, the support of these members has been asked for.

Scandinavian Markets.

American motor cycle manufacturers are not wasting much time in getting on to a peace footing. Representatives are active in Sweden and Denmark already, and establishing central sales organisations, and have altered their pre-war policy by offering credits. The importation of cars is already very heavy, and apparently the position will soon be the same with regard to motor cycles.

The Moto-Cycle Club de Lyon.

We have had a communication from M. Bothier, secretary of the Moto-Cycle Club de Lyon, Place des Terreaux, Lyons, in which he offers assistance to English motor cyclists passing through that town by giving them information as to how to traverse the town, and all help possible. Lyons is a town which has been closely connected by trade with England for many generations, and its inhabitants are exceedingly amicably disposed towards everybody and everything British.

Touring in Ireland.

We understand from the R.A.C. that a member who has recently undertaken a tour in the South of Ireland reports very favourably on his experiences there. He found the hotel and garage accommodation quite good, while the roads generally were in fair condition. The tourist frequently took his meals by the roadside, and he commends the hospitality of the people in supplying hot water and other necessities. This motorist's experience provides a happy contradiction to the somewhat prevalent fear that Ireland is not an inviting land for the motor tourist just now.

Thief-proof Devices.

The Autocar last week gave illustrations and particulars of upwards of a dozen thief-foiling devices for attachment to cars. Many of these could be adapted for use on a motor cycle, and we invite readers to send suggestions regarding such fittings.

Australia and the U.S.A.

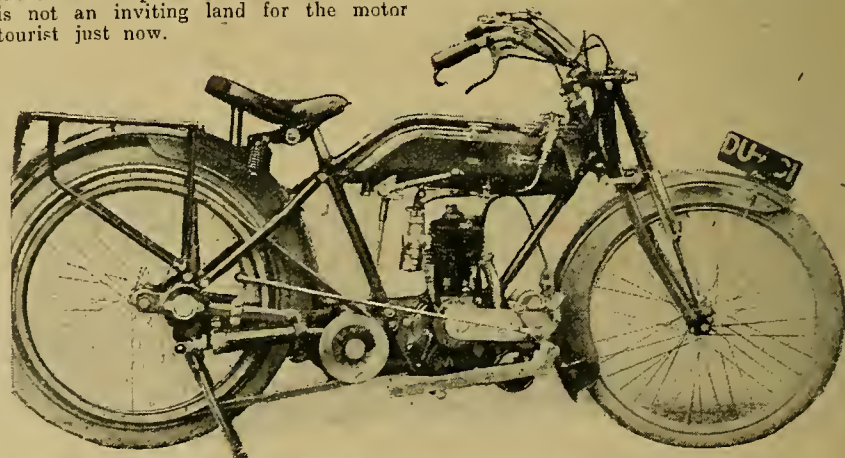
Recent sporting events held in U.S.A. reveal the overwhelming proportions of American made machines compared with those of other countries. This is not as it should be, though it must be said, in fairness to the British representative makes, that they generally make a good showing against the often higher-powered Yankees. The actual proportion of British machines to American in the three or four most recent trials amounts to something less than four per cent.

An Amalgamation in Belgium.

An amalgamation has just been made between the Royal Automobile Club of Belgium and the Belgian Motor Cycling Club. Members of the Royal Automobile Association of Belgium become members of the R.A.C.B., the president of the Association becomes vice-president of the R.A.C.B., members of its council are admitted to the councils of the R.A.C.B., and vice-presidents of committees of the R.A.A.B. become vice-presidents of committees of the R.A.C.B.

Electricity and the Motor Cyclist.

But few motor cyclists have more than a very elementary knowledge of electricity, both as regards its application to ignition and to lighting, and, although written primarily for the car owner, "Electricity and the Motor Car," by F. H. Hutton, will not fail to interest and be of immense use to the motor cyclist who wishes to know more about the subject. This book is published by the proprietors of *The Motor Cycle*, and contains, among others, lengthy chapters on first principles, their direct application, accumulators, ignition, dynamo-battery ignition, and modern magnetos, all of which are as useful to the motor cyclist as to the car owner. The price of the book is 4s. 6d. net. or by post 4s. 10d., and may be obtained from leading booksellers, or from Messrs. Iliffe and Sons Ltd., 20, Tudor Street, London, E.C.4.



A 2½ h.p. Coventry Challenge fitted with an experimental spring frame of a new type.



142 motor cyclist competitors start. 126 finish (equalling 88.7% successes), 63 being mounted on solo machines, and 63 on passenger motor cycles.

wheels belonging to spectators. The A.B.C. scooter "scooted" through the crowd and caused great amusement.

Reunion of Motor Cyclists.

It was a happy reunion of many old friends, for the entrants had come from all quarters—including Ireland—to compete in the classic event. The Services were well represented. There were upwards of forty makes, of which a dozen were new models which very few had seen. Most of these Peace models are in every way worthy of the British motor cycle industry, and nothing but good can come of their being displayed before a patiently waiting public.

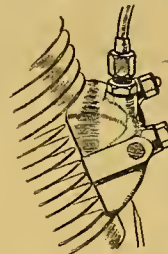
The Clynos now have red and black tanks, and look particularly smart.

Mr. H. F. S. Morgan's runabout attracted everyone's attention by its white finish and black guards, etc. The new spring frame Matchless and Chater-Lea are a light buff. The latter machine employs a single leaf spring, which constitutes a very neat suspension.

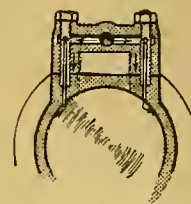
As the hour of nine approached, the crowd became denser, and when the first of the competitors—Sec.-Lt. W. Cooper (Douglas)—was sent away by Mr. A. V. Ebbelwhite, there was only a narrow lane

extending for half a mile between two deep rows of spectators.

For the first time, the trial started in daylight, thanks to summer time, but, by the time the first of the sidecars started, it was time to light up, in which connection it was quite noticeable the



(Left) Showing how the oil is led into transfer port cover of the 1919 2 1/2 h.p. two-stroke Clyno.



(Right) Section of transfer port cover, showing how oil travels from main oil lead through centre of studs to the piston.

number of machines which were equipped with electric light. Several of the machines were fitted with the latest Lucas combined lighting and ignition unit. We counted over twenty lady passengers.



J. D. Campbell and his passenger, New Zealand motor cyclists, on an A.J.S.

the Blackburnes, Rex, and A.J.S. also had their group of admirers.

The interest of between 5,000 and 10,000 spectators was not idle curiosity, as every other person seemed to have in his hands a copy of either *The Motor Cycle* or the official programme. Even the police were interested, and were seen studying the machines with *The Motor Cycle* as a guide, and it was clear that their interest was in no way connected with their activities in measuring the lenses of the lamps. Quite a large squad of police were on the spot, including mounted men to help to keep a clear path for the competitors to pass through.

In addition to the competing machines, there were motor cycles of every description, and bicycles propelled by Auto-



Scene at the start from Highgate on Friday evening last. The crowd was immense, and almost completely hid the new machines from view.



The start—for the first time in daylight. Sec.-Lt. Cooper (No. 1), the organiser of the run, and Major L. A. Baddeley, awaiting the starter's signal.

THE RUN DESCRIBED BY A COMPETITOR.

Once more *en route* for Edinburgh after five years' interval! There seemed to be the same bustle and the same familiar faces. But we missed that searchlight at the start, the darkness overhead, and the hundreds of lamps. Now we comfortably glide away in broad daylight, and the night journey somehow seems shorn of its terrors.

Our immediate companions were old stagers, purposely placed in front to lead the way. W. Cooper, the trials hon. sec., was number one, and for half the journey escaped the dust, a 2½ h.p. Douglas carrying him on his important mission. L. A. Baddeley, also on a Douglas, one of the travelling marshals, was number two, and then followed Olsson (4 h.p. Douglas). Our old friend A. J. Sproston, now home from Egypt, and back in civilian life, was on a Lea-Francis, Moffat on one of the new 3½ h.p. Douglasses, A. C. Rob-

bins on a new Wooler, Hemy on a Metro, and Scott on a 5-6 h.p. James. It was a perfect evening.

The vanguard stopped quite reluctantly outside Hatfield to light lamps. It seemed a shame not to go on until the last glimmer faded from the summer sky. Here we met a small naval contingent, foregathered to cheer their ship-mate, Lt. Kidston, R.N., who, after his ship was torpedoed early in the war, served in H.M.S. *Orion* under the late Sir Robert Arbuthnot, who told him of the joys of the London-Edinburgh run. Near Welwyn we saw the first victim of the many tyre troubles.

The roads being good, naturally it was the easiest thing in the world to be ahead of time: consequently there were several waiting outside Baldock. Here Nicholson (Sunbeam) reported two punctures already. Another early sufferer was Robertson Brown (Henderson), who was knocked over by a non-com-

petitor near Potters Bar, had his carrier broken, and for the rest of the long journey had to carry a heavy bag slung over his back.

Impressions of the Night Trip.

It had been very hot at the start, but, once started, it was comfortably cool; so much so that we feared that De Arango, the Brazilian naval lieutenant, who wore only a drill suit and no overalls, would feel chilled to the bone, but he appeared happy, nevertheless, on his Harley-Davidson.



Lt. J. A. W. Armstrong (3½ h.p. Lea-Francis).

The surface was fairly good, but it threatened to become dusty at Biggleswade, the first check. Here the arrangements were excellent. Petrol and necessities for the machines were promptly served out, and the proprietors of the Swan Hotel had a splendid spread for the competitors. It was not really dark till this place was reached, and when we left the sidecars were arriving. Some of the competitors used wonderfully power-



At every point the interest of the public in the new mounts was shown by the crowds around them. (Left) A group about Emerson's A.B.C. sidecar. (Right) Hugh Gibson's new Clyno is admired at York.

The London-Edinburgh Run.—

ful head lights, causing a weird effect on those who were not so well equipped. We were using a quite effective and well-trusted small Lucas head light, but some of the electric projectors threw so brilliant a beam that the shadow of the rider ahead danced in front of him nearly all the time, thrown on the road, against the trees, or, worst of all, against a cloud of dust.

After the last stop the one or two dangerous corners were well marked, and all was plain sailing till we reached the district round Alconbury, when there were several miles of rather bad road, which was struck unexpectedly. We had been warned of a rough stretch near Stamford, and close to where it began we came across two policemen, whose advice we followed, and by keeping close to the side of the road we were considerably less inconvenienced than most. Hereabouts G. A. Read (Coulson) lost his tool kit, and was later reported to have crashed and had to retire.

An Automatic Tail Light.

On the way to Grantham we saw something of the Scootamota, which was being ridden by a non-competitor. To this point it travelled well, but having lost the silencer, blue flame shot out behind.

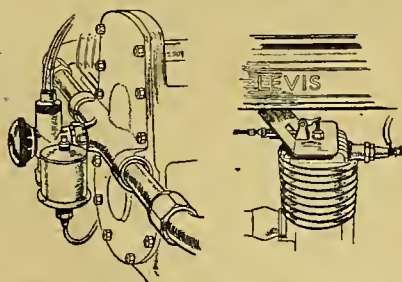
This was the first Edinburgh run in which tail lamps were compulsory, and the effect of the long string of these during the night was very strange, but not all of them, unfortunately, kept alight. It had been a wonderfully fine night run, and an equally fine day followed.

Here stories were exchanged of experiences of the night trip. At Buckden some thoughtful people with a car provided free tea for those requiring it, which was much appreciated. Later some stray horses were encountered, which were said to have driven at least one competitor into the ditch.

The roads were good on the whole to Doncaster, but excessively bad from Ferrybridge to York, where again the arrangements were splendid. The most



At the York check, which was in the hands of the Rev. H. T. S. Gedge, who is shown taking the times of K. V. Chidley (flat twin Wooker) and G. F. Ammon (2 1/2 Metro-Tyler).



(Left) The cover of the timing gear case of the 5 h.p. Brough flat twin is extended to form a manifold.

(Right) An aluminium air deflector fitted between the tank and the cylinder head on Mr. Pike's 2 1/2 h.p. Levis.

interesting part of the morning journey was from Scotch Corner to Penrith, through glorious country under an Italian sky, but, unfortunately, the dust! Several competitors continually rode in inseparable groups.

Troubles en Route.

D. S. Baddeley (P. and M.) had contact breaker trouble near Brough, whilst Douglass (Harley-Davidson sc.) was in collision and buckled both wheels and retired. W. Cooper (Douglas), who had had electrical trouble, passed at a rare "bat" near Penrith, his troubles over for the day. Luigi (B.S.A.) had punctures in this section. News also reached us that the fine old sportsman Dover (Douglas sc.) had to withdraw owing to eye trouble due to defective goggles.

After luncheon at Carlisle the sky became overcast, and a violent south-west gale sprang up.

The climb to Mossbail summit (800ft.) caused no trouble. Many rested at the inn at the top for tea. Here the weather was glorious again and the conditions excellent. Later our only trouble with the A.B.C. occurred, an exhaust rocker sticking, owing to dust. It caused a little delay, but, once put right, the machine ran beautifully, and finished to time. Hawick, the next and last check before Edinburgh, was enjoying a holiday, and the streets were thronged with people.

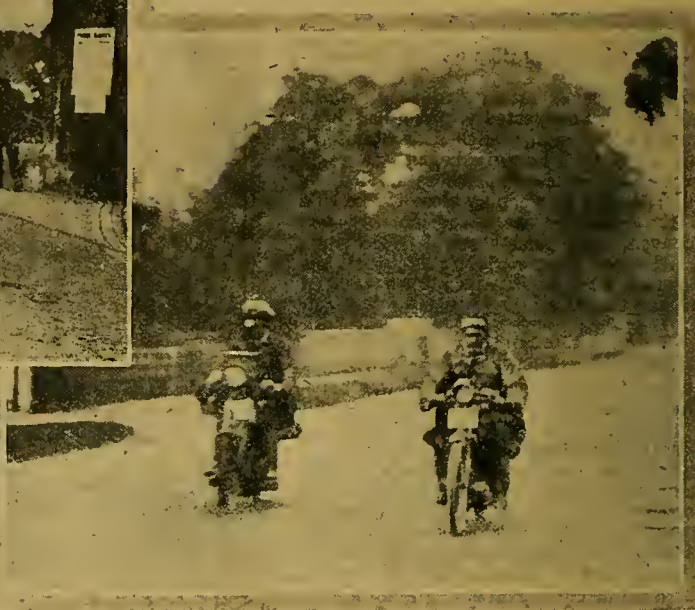
Later in the afternoon rain fell heavily, and the journey, almost to the finish, was by no means comfortable. Happily it was fine again before Liberton was reached, and, except for this final down-pour, the weather had been glorious. Naturally, the number of successes was considerable. But ill-fortune overtook a number among these, other than those previously mentioned, being Frank Smith, who, owing to gear box trouble, retired at Doncaster. Another of the new models which failed to finish was the flat twin Wooker (ridden by A. C. Robbins) which developed engine trouble near York. The sister machine (ridden by Chidley) finished successfully. Nias (Rudge) was reported



R. C. Davis (8 h.p. spring-frame Chater-Lea sidecar), one of the first of the sidecars to start with lighted lamps.



(1) Entering York. (2) Nearing the finish. Competitors going well after eighteen hours riding.



to have retired after an accident, while Harrison (Norton) had his magneto break down before reaching Grantham. Cleese (Norton sc.) suffered with tank trouble early in the run, and failed to finish.

As regards the seven cycle cars entered, the Morgans, of which there were five, ran exceedingly well, especially that driven by H. F. S. Morgan. Nash's G.N. also ran most consistently, and was

LIST OF SURVIVORS.

Lt. W. Cooper (2½ Douglas)
Maj. L. A. Baddeley (2½ Douglas)
V. Olsson (4 Douglas)
A. J. Sproston (3½ Lea-Francis)
P. W. Moffat (3½ Douglas)
E. M. F. Bollean (3 A.B.C.)
W. C. Hemy (2½ Metro-Tyler)
Capt. A. M. C. Scott (5-6 James)
Lt. J. A. W. Armstrong (3½ Lea-Francis)
R. L. Williamson (4 Triumph)
Fred Notari (4 Triumph)
N. Rycroft (4 Triumph)
P. C. Boxer (4 Triumph)
T. J. Ross (4 Triumph)
Mario Luigi (4½ B.S.A.)
H. R. Lane (4½ B.S.A.)
A. J. Cocks (2½ Clyno)
S. Hall (3½ Rover)
Tudor Thompson (2½ Douglas)
A. E. Walker (2½ Hobart)
Maj. R. T. Leather (2½ Douglas)
P. W. White (4 Triumph)
Capt. J. A. Bourne-Watson (4 Blackburne)
T. H. Weaver (2½ Sirrah-Verus)
W. R. Preston (3½ Sunbeam)
F. E. Salter (3½ Rudge)
C. H. Hunt (3½ Zenith)
Lt. F. H. Ronksley (8 Zenith)
G. F. Udall (2½ Chater-Lea)
Leslie Pailham (3½ Ariel)
W. J. Lake (2½ Omega)

Lt. G. P. Glen Kidston (3½ Sunbeam)
P. Pike (2½ Lewis)
P. J. Enticknapp (4 Blackburne)
Lt. L. de Arango (7 Harley-Davidson)
B. Alan Hill (3½ Zenith)
H. R. Harveyson (6 Matchless)
H. Walker (2½ Lewis)
J. F. Hull (2½ Wooler)
P. T. C. Body (3½ Sunbeam)
C. W. Addingley (3½ Humber)
J. E. Addingley (4½ B.S.A.)
George F. Ammon (2½ Metro-Tyler)
Sec.-Lt. W. S. Jameson (6 A.J.S.)
Capt. D. S. Baddeley (3½ P. and M.)
K. V. Chidley (2½ Wooler)
J. E. Sharp (3½ Humber)
E. C. R. Johnson (3½ Humber)
A. H. N. H. Hewitt (6 Zenith)
L. Nicholson (3½ Sunbeam)
W. J. Fleetwood (2½ Douglas)
H. Phillips (2½ Allon)
Alec McClude (2½ Allon)
L. E. Clulee (2½ Allon)
Lt. R. C. Charlesworth (5 Zenith)
T. Rutherford (3½ Sunbeam)
J. Robertson Brown (8-10 Henderson)
H. Reyre (6 James)
Capt. A. N. Kingwell (2½ Douglas)
F. G. Ball (2½ Douglas)
George Wray (3½ Triumph)
H. G. Bateman (2½ Diamond-Jap)
K. de B. Smart (6 Zenith sc.)

E. A. Bridgman (7 Indian sc.)
F. A. Applebee (7 Indian sc.)
J. Haslam (4 Douglas sc.)
Gordon Fletcher (4 Douglas sc.)
W. B. Gibb (3½ Douglas sc.)
Lt. S. F. Garrett (9 Blackburne sc.)
J. S. Holroyd (8 Blackburne sc.)
Hugh Gibson (8 Clyno sc.)
J. Stevens (6 A.J.S. sc.)
R. C. Davis (8 Chater-Lea sc.)
Jas. McKenzie (6 Humber sc.)
A. Mabon (4 Mabon sc.)
W. A. Fell Smith (7 Harley-Davidson sc.)
P. D. Walker (4½ B.S.A. sc.)
Capt. J. L. Stocks (3½ Ariel sc.)
H. H. Saddington (5-6 James sc.)
T. C. Delahay (3½ Sunbeam sc.)
T. H. L. Witt (6 Enfield sc.)
E. G. Johnson (4 Douglas sc.)
J. A. Master (7 Harley-Davidson sc.)
Thompson Thompson (4 Douglas sc.)
John Higer (3½ Rover sc.)
A. J. Read (8 Sunbeam sc.)
Lt. Don Kaye (8 Zenith sc.)
E. Milton (5-6 A.J.S. sc.)
N. P. Tippet (4 Rex sc.)
John Gosal (8 Bat sc.)
R. C. Osborne (7 Harley-Davidson sc.)
Stanley Julian (6 A.J.S. sc.)
E. Atkins (3½ Ariel sc.)
F. J. Ellis (8 Matchless sc.)

Capt. R. Haywill (6 A.J.S. sc.)
Rex Mundy (8 Matchless sc.)
G. W. Wilkin (5 Brough sc.)
Thomas Bullas (3½ P. and M.)
F. B. G. Vale (3 Enfield sc.)
S. Sawyer (4 Norton sc.)
F. E. Jones (3½ Ariel sc.)
D. R. O'Donovan (4 Norton sc.)
J. D. Campbell (6 A.J.S. sc.)
George Stevens (6 A.J.S. sc.)
H. Minton (3½ Sunbeam sc.)
Dan Bradbury (4 Norton sc.)
Jack Emerson (3 A.B.C. sc.)
E. J. Pittcock (5-6 James sc.)
E. C. Townshend (3½ Sunbeam sc.)
Victor Deacock (4 Douglas sc.)
F. Thorpe (4 Douglas sc.)
A. G. Fenn (3½ Zenith sc.)
J. Smith (6 Enfield sc.)
J. A. Houlst (8 Matchless sc.)
E. Marshall (6 Enfield sc.)
F. H. Richards (5 Zenith sc.)
George Nott (5-6 Clyno sc.)
C. Pearson (4 Douglas sc.)
H. Le Vack (8 M.A.G. Motosacoche sc.)
George Pettyt (8 Morgan)
Vicent McGarigle (8 Morgan)
Eric Williams (8 Morgan)
Lt. Harry G. Bell (8 Morgan)
H. F. S. Morgan (8 Morgan)
Maj. E. B. Lathbury (3½ Rover sc.)

NOTES ON THE TRIAL.

Altogether the run was one of the most successful the Club has ever held, and the organisers deserve the greatest credit.

George Wray rode a 1909 Triumph he bought for £14, which he fitted with a gear of his own design.

The inseparable Jacobs and Le Grand could not compete, as their new Rex mounts could not be completed in time.

Mr. Duncan-Watson at the start thoughtfully presented each Harley-Davidson driver with a box of cigarettes and matches.

Major Baddeley (Douglas) came through successfully on tyres six years old.

Emerson's A.B.C. outfit was only finished at the last moment. The engine had not even fired before ten o'clock on the morning of the trial.

The Blackburne firm was fortunate enough to get all their new models through, and to finish successfully.

Great interest was evinced in the run throughout. Even in the country groups collected at cross roads and on the few hills on the route to observe the long procession of competitors.

delayed only by a puncture near Carlisle. The Duncan, a belt-driven cycle car, fell behind during the night, and was last seen near Wentbridge.

Below we give a list of those who completed the journey; as to who gained medals, nothing can be said till all the checkers' sheets have been verified.

Competitors had to cover the journey in twenty-three hours to obtain a gold medal, and twenty-four hours and thirty hours for silver and bronze medals respectively.

The 1919 model all-black A.J.S. sidcars ran like clockwork throughout.

Most of the non-starters were prevented from competing from the all-too prevalent delay in delivery of new models.

An amusing notice near a dangerous corner on the route read "Sound your horn," and in small letters underneath, "and save your neck."

Mr. W. H. Wells led the procession aboard his 25 h.p. Overland—the first official car. Lt.-Col. Chas. Jarrott was at the helm of the second official car—a white 25-30 h.p. Crossley.

**Oldham and District M.C.**

Entries close on Friday, the 20th, at 7 p.m., for the Oldham and District M.C. hill-climb at Booth Dene on the 21st. Hon. sec., Mr. H. Wright, 134, Manchester Street, Oldham.

York and District M.C.C.

The interest of Yeovil motor cyclists in the local club augurs well for its future. A strong committee has been formed consisting of Messrs. P. W. Moffatt, F. E. Butt, F. Mason, Courtney Williams, E. Arnold Wright, V. Tucker, R. Field, A. Ewens, W. J. Edwards, E. Chaffey, E. Woodman, Mrs. Charleston, and Mrs. Lukin. The secretary is Mr. Joseph Ewing, jun., 17, Wyndham Street, Yeovil.

Edinburgh and District M.C.

A sporting open one-day reliability trial will be held by the Edinburgh and District M.C. on Saturday, the 14th, open to all classes of motor cycles and cars. The trial starts at 1.30 p.m. on the Liberton tramcar terminus. The course, eighty miles, is a secret one, and certain hills will be observed, up all of which a clean ascent must be made. There will be a stop of 1½ hours for tea, during which no repairs or adjustments may be made. The organisers are Messrs. F. J. Hutchisson and H. McClae, 6, Castle Terrace, Edinburgh.

The Junior Car Club.

The Junior Car Club will hold a hill-climb on South Harting Hill, open to members only, on the 21st. Class 1 will be open to standard three-wheeled cycle cars with engines not exceeding 1,100 c.c. carrying a passenger. Awards will be made on time and formula according to the number of entries received. The formula has been devised by Maj. A. M.

W
Low, and is $\frac{W}{C1.1 \times T1.3}$. The trials hon. secretary is Mr. G. N. Higgs, 31, Vauxhall, Bridge Road, London, S.W.1.

Harrogate and District M.C.C. Trial.

The Harrogate Club was blessed with a most glorious day for its reliability trial held on June 1st, but it was a pity the members were not also blessed with delivery of new models, for then the entry would have been considerably larger. The course picked out was about 100 miles in length, and included such hills as Middlesmoor Hill, Greenhow, Church Bank, and Leathley Bank (all included in non-stop sections). It was, however, sufficiently arduous to eliminate quite a number of machines.

Except for the three riders who tied for the awards, most of the remaining competitors experienced puncture troubles. The results are as follow:

1. W. B. Atkinson (4 Triumph).
2. W. E. Grange (3½ P. and M.)
3. D. Moore (3½ P. and M.)

Future Events.

June 14.—M.C.U. of Ireland, Ulster Centre. Speed Trials at Magilligan.
 June 14.—Sheffield and Hallamshire M.C.C. Run to Cowdale.
 JUNE 14.—WESTERN M.C.C. (GLASGOW). OPEN HILL-CLIMB.
 June 14.—Wolverhampton M.C.C. Run to Wellington Wrekin.
 JUNE 14.—YEovil AND DISTRICT M.C.C. RELIABILITY TRIAL.
 June 15.—Eastern Counties M.C. Run to Little Waltham.
 June 15.—Essex M.C. Run to Southend.
 June 15.—Middlesbrough and District M.C.C. Picnic on Whitby Moor.
 June 15.—N.M.C.F.U., Birmingham and Coventry Branches. Joint Hill-climb at Broadway.
 June 15.—N.M.C.F.U., Leeds. Run to Doncaster.
 June 15.—N.M.C.F.U., Portsmouth. Picnic Run to Waggoner's Wells.
 June 15.—North Derbyshire M.C.C. Run to Ashbourne.
 June 15.—Rochester, Chatham, and District M.C. Run to Rye.
 June 15.—S. Birmingham M.C.C. Run to Knightwick.
 June 15.—Worcester and District M.C.C. Opening Run to Stratford-on-Avon.
 June 15.—Yeovil and District M.C.C. Run to Longcat.
 JUNE 15.—MIDDLESBROUGH AND DISTRICT M.C.C. RELIABILITY TRIAL FOR CRADY CUP.
 June 18.—Westmorland M.C.C. Social Run to Windermere, etc.
 June 18.—Yeovil and District M.C.C. "Treasure Hunt."
 June 19.—N.M.C.F.U., Leeds. Half-yearly General Meeting.
 JUNE 20.—A.C.U. COMMITTEE MEETING AT BRISTOL.
 June 20-21.—Sheffield and Hallamshire M.C.C. Reliability Trial to Holyhead for Hulton Shield.
 JUNE 21.—BRISTOL M.C.C. RALLY AT ASHTON COURT.
 JUNE 21.—JUNIOR CAR CLUB. HILL-CLIMB AT SOUTH HARTING.
 JUNE 21.—MIDDLESBROUGH AND DISTRICT M.C.C. SPEED JUDGING COMPETITION.
 JUNE 21.—OLDHAM AND DISTRICT M.C. HILL-CLIMB. BOOTH DENE.
 June 21.—Public Schools M.C.C. Surprise Competition.
 JUNE 26.—YEovil AND DISTRICT M.C.C. AND TACENTON M.C.C. INTER-CLUB HILL-CLIMB.
 JUNE 28.—BIRMINGHAM M.C.C. SPEED TRIALS.
 JUNE 28.—LIVERPOOL M.C. TWENTY-FOUR HOUR TRIAL TO EDINBURGH.
 JUNE 28.—M.C.U. OF IRELAND, ULSTER CENTRE. RELIABILITY RUN.
 JUNE 28.—MIDLAND C. AND A.C. RELIABILITY TRIAL.
 JULY 4 AND 5.—ARBUTHNOT TROPHY TWO DAYS TRIAL. PLYMOUTH DISTRICT.
 July 5.—M.C.C. Hill-climb.
 JULY 6.—OLDHAM AND DISTRICT M.C. RELIABILITY TRIAL.
 JULY 12.—LIVERPOOL M.C. RACES AT COLWYNN BRYCHEL.
 JULY 12.—WOLVERHAMPTON M.C.C. OPEN TRIAL.
 JULY 14-15.—M.C.U. OF IRELAND, ULSTER CENTRE. IRISH END-TO-END RELIABILITY RUN.
 JULY 16.—ESSEX MOTOR CLUB SPEED TRIALS AT SOUTHEND.
 JULY 19.—BIRMINGHAM M.C.C. MIDLAND CUP TRIAL.
 JULY.—MIDDLESBROUGH AND DISTRICT M.C.C. 200 MILES RELIABILITY TRIAL FOR GJERS AND NEW HUDSON CUPS.
 AUG. 16.—S.E. COUNTIES INTER-TEAM TRIAL.
 SEPT. 3.—M.C.C. TEAM TRIAL FOR "THE MOTOR CYCLE" CUP.
 SEPT. 15-20.—A.C.U. SIX DAYS RELIABILITY TRIALS.

Public Schools M.C.C.

Competitors in the Surprise Competition on the 21st inst. meet at the ten-mile speed limit post out of Barnet on St. Albans Road at 2 p.m. The competition will consist of a run of about forty miles. Entries close on the 17th inst. Hon. sec., Mr. H. P. Browning, Riverbank, Staines.

Glasgow M.C.C.

The Glasgow Motor Cycle Club will hold a gymkhana on 21st inst. at Glebe Park, Largs. Many entertaining events are included in the programme.

Entry forms may be obtained from Mr. W. Muir, 20, Monteith Road, Glasgow.

Doncaster and District M.C.C.

After three years inaction, owing to the death of the late secretary, Mr. E. Goult, and the War, the old club, which has been one of the strongest clubs of the North, has again been formed, with Mr. J. Franks as new president and Bargrave D. Gray as secretary. A good strong working committee has been formed, and the first social run is fixed to take place on June 22nd to Roche Abbey. Mr. B. D. Gray, 3, Hall Gate, Doncaster, will be pleased to hear of, and give any help to, other clubs running through Doncaster.

South Birmingham M.C.C.

A protest made by T. Stevens was upheld at a committee meeting when the South Birmingham M.C.C. decided the results of the reliability trial described in our last issue. This alters the awards as below:

First in each class receives gold medal, second silver medal, and third bronze medal.

ABOVE 300 C.C.

1. T. Stevens (4¼ James and sidecar).
2. L. Newey (3½ Ariel and sidecar).
3. G. Dalby (4 Triumph).

UNDER 301 C.C.

1. B. Kershaw (2½ Imperial-Jap).
2. I. E. Clulee (2½ Allon).
3. A. Elleman (2½ Allon).

Westmorland M.C.C.

There was a good muster of motor cyclists at the recent annual meeting, held at the Commercial Hotel, Kendal. The prospects of reorganisation would appear to be excellent, but the competitions for the present season will be limited in number, owing to the lack of up-to-date machines. Officials for 1919 were elected as follows: Hon. sec., Mr. Joseph Wright; hon. treasurer, Mr. R. P. Montgomery; trial secretaries, Messrs. Arthur Moffatt and W. Westwood; auditors, Messrs. W. D. Stewart and F. A. Ireland.

Herts County A.C.

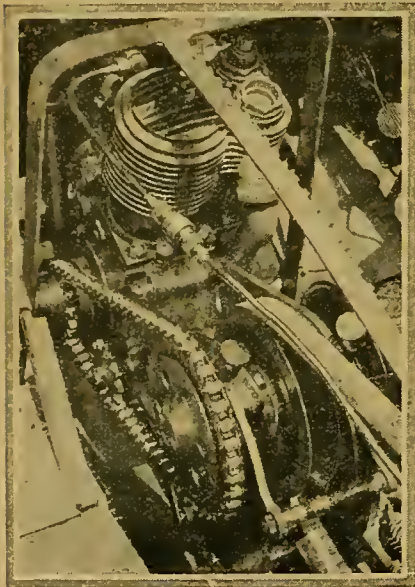
The committee of the Herts County Automobile Club desires it to be more widely known that there is a motor cycle section of the club to which the subscription is ten shillings and sixpence.

A new motor cycle committee is about to be formed, and a programme of competitions is in course of being arranged to include hill-climbs, reliability trials, consumption trials, speed-judging, and inter-club competitions, etc. New members are eligible for election to the motor cycle committee. Membership forms may be obtained from the hon. secretary at 173, High Street, Watford, Herts.

A RIVAL TO THE SIDECAR.

The Bleriot-Whippet, a Small and Speedy Runabout, to be Produced in Quantities.

THE runabout built by Messrs. Jones and Marchand and described in our issue of March 13th is to be marketed by the Air Navigation and Engineering Co., Ltd., of Addlestone, Surrey, and is to be named the Bleriot-Whippet. This company has an ambitious programme, and arrangements are well forward to produce some thousands of these small vehicles, the entire capacity of the works being devoted to their production. It is intended that the Bleriot-Whippet shall be essentially a rival to the sidecar and motor cycle, as speedy and as economical, but with equal comfort and weather protection to driver and passenger.



A view of the engine and countershaft, showing pulley contracted on high gear. Note the long square notched quadrant.



The 8-h.p. Bleriot-Whippet on the road.

Only the experimental model is running at present and, we are informed, certain alterations will be embodied in the standard production model. These modifications consist first in the fitting of an 8 h.p. Blackburne twin, of 85 mm. x 88 mm., with an outside flywheel and detachable cylinder heads. With this engine a single disc Ferodo-lined clutch will be fitted to the left hand extension of the crankshaft, and the starter will be altered. Originally, there was a lever on the near side of the car arranged to operate a rack and pinion, but in future the lever is to be placed within reach of the driver on the right hand side, and will control a segment meshing with a pinion connected, through a free-wheel, to the crankshaft extension.

The pedal brake will operate a V block working in the rear axle pulley, while the hand lever is to be connected to a

pair of expanding shoes housed in a drum on the countershaft.

Certain alterations to the body, wheels, and chassis sizes bring the wheelbase to 6ft. 9in., the track to 4ft. 2in., and the tyre size to 700x80 mm., but the change is so proportioned that the general lines of the machine remain unaltered. It is probable also that there will be a modification to the front axle enabling the car to be turned in the width of the average main road.

The ingenious variable pulley, with its cam-operated jockey sprocket to take up the slack in the engine primary drive chain, is retained, while the axle still has its large belt pulley in the middle.

There will possibly be two models, one completely equipped with hood, screen, lamps, etc., and the other a sporting model. The de Luxe model is not yet priced; but the latter is to cost about £175.

To Find a Winner by Efficiency Tests.

THE Midland Cycle and Athletic Club trial on the 28th inst. promises to be a most strenuous event, as the committee have set themselves the task to find a winner for the premier awards without resorting to the unpopular secret check or speed-judging. Some very prominent members of Midland sporting circles are behind the event, several of whom are connected with the manufacturing trade, and an honest endeavour is being made to organise a trial in which only the best riders on the best machines can obtain an award. The course is about 200 miles in length, and the trial will start at 6 a.m. on the first section of 80 miles, when a second "breakfast" will be partaken. After an hour's interval, there is a second section of 130 miles to the lunch stop of one and a half hours.

No adjustments will be permitted, and a severe brake test will be imposed on a

hill which will "discover" poorly braked machines. There will also be a stop and restart test on a hill, and also a flexibility test, the first part of the hill to be taken slowly, and the second part fast.

Competitors for this test will be divided into a number of classes, according to the type of machine, and their time ratio will be the slow divided by the fast time. The flexibility figure of merit will be the time ratio divided by the average time ratio of a certain number of the best time ratios in the same class, which will equalise, as far as possible, the chances of the different types and sizes of machine. From this test all the chief awards will be made if all other marks are equal.

Each competitor will be credited with 100 marks, and deductions made as follow:

Ten marks for any stops other than official ones.
One mark per minute for each complete minute late or early at any checked point.

Five marks for "footing" of any kind, or for dismounting and running the machine.

Five marks for failure at stop and restart test. Failure at brake test will mean disqualification.

The prizes are as follow:

The M.C. and A.C. Trophy, for the best performance of the day, irrespective of class.

The "Jordison" Trophy, for the best performance by any passenger machine.

The "Trader" Trophy, presented by the proprietors of our trade contemporary, *The Motor Cycle and Cycle Trader*, for the best performance by any solo machine of over 350 c.c.

The "B.N." Bowl, presented by the proprietors of *Bicycling News*, for the best performance by any lightweight machine of 350 c.c. or under.

In addition there will be three valuable prizes for the best performance by (1) a private owner, (2) a lightweight of 275 c.c. or under, (3) for the best performance by a club member.

Gold medals will be awarded to all riders gaining 100 marks and silver medals for ninety marks.

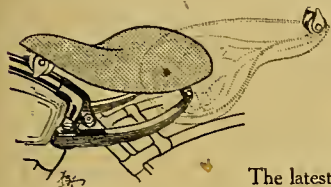
Entries close Wednesday (first post), June 18th. Entry forms may be obtained from the hon. trials sec., Mr. F. J. Urry, Lionel Street, Birmingham.

FEATURES OF THE ZENITH FLAT TWIN.

MR. F. W. BARNES, the former Zenith exponent, is responsible for two very practical inventions which will shortly be found on all Zenith machines. These are a saddle and a rim brake.

The saddle is a most practicable device, the seat portion being suspended on two quarter-elliptical springs clipped on to lugs fastened to the saddle tube, while the forward end of the saddle runs on a roller on the top tube.

As will be seen from the illustration, the saddle can be turned up so that the



The latest Zenith saddle.

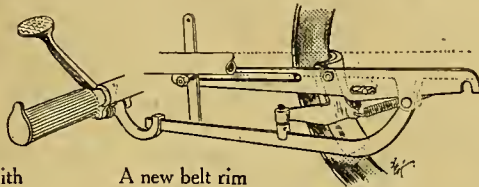
seat is kept dry in the event of the motor bicycle being left out of doors during a shower of rain.

The whole device is exceedingly simple, and in use we found it to be most comfortable when we tried it on the new 2½ h.p. flat twin Zenith lightweight. This machine is quite a departure for this firm, and retains the well-known Gradua gear so long associated with Zenith Motors, Ltd. The engine follows more or less conventional design, having cylinders

60 mm. bore and 58 mm. stroke. Below the crank case is carried a countershaft driven by chain from the engine shaft, on which is mounted the expanding pulley gear forming part of the Gradua system.

Our short test revealed that the engine is practically vibrationless, and the gear all that can be desired, and we have no doubt that this model, when ready for the market, will be an extremely popular one.

The other invention refers to all models of Zenith motor bicycles, and is

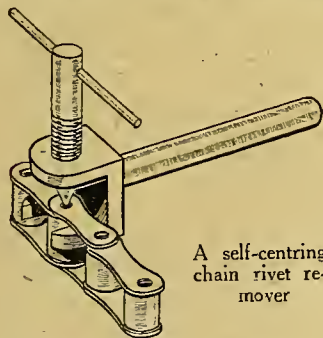


A new belt rim brake.

a simplified and improved form of belt rim brake. This brake is an exceedingly clever idea, as it does away with the use of control wires. It can be brought into operation no matter where the position of the back wheel may be, whether slid forwards for high gear or backwards for a low gear ratio. By depressing the pedal the arm hinged on the carrier supporting the brake shoe is raised. As this arm is lifted it raises the bell crank on the brake shoe, moving the shoe with it.

A USEFUL CHAIN RIVET REMOVER.

WE have lately received a sample of an excellent self-centring chain rivet punch from Mr. Chas. Talbert, 73, Westbury Road, Walthamstow, Essex. The tool is made from solid bar



A self-centring chain rivet remover

steel with a rust-proof finish. As it is case-hardened throughout, it should wear indefinitely, and stand all the rough usage to which motor cycle tools are generally subjected when carried on the machine. Also, although of a convenient size for the work it has to do, the rivet remover is small enough to be carried in the tool roll.

It is made in two sizes, for chains of ½ in. pitch, ⅝ in. in width and upwards, and a larger size to fit ¾ in. and 1 in. pitch chains of any width. It is an exceedingly useful tool, which no rider of a chain-driven machine should be without.

"THE MOTOR CYCLE" ROAD MAPS.

THOSE motor cyclists who do not use road maps little realise their value on the road, and the entertainment they provide during winter evenings. There are many riders who make a habit of marking a map showing the roads covered during each summer, thus making a permanent record, and, by the time the picnic baskets are packed away for the winter, the map has become a key for many a fireside tour.

A map should be mounted on canvas if it is to be of good service to the motor cyclist, and also contained in a case for carrying in the pocket of the sidecar, or one of the pannier bags on a solo machine. The *Motor Cycle* road maps are prepared specially for motor cyclists, and are obtainable in a strong cloth wallet. Three maps comprise the set. (1.) England and Wales (scale sixteen miles to the inch); (2.) Scotland (scale sixteen miles to the inch); and (3.) London (four miles to the inch). Three grades of roads are clearly shown together with marks showing where garages and hotels are to be found. Road summits and intermediate distances between towns are also indicated.

The London map will be found invaluable to those who wish to get round London on a tour, such routes being marked in a distinctive colour. The price of the complete set, in case, is 4s. 6d., or, by post, 4s. 10d., and are obtainable from our publishing offices, 20, Tudor Street, London, E.C.4.

PARR-EAGLE RUNABOUT.

THE Parr Eagle Runabout, described in our issue for May 15th, has six speeds forward and a reverse. The accompanying illustration shows the gate for the gear lever, which is located and



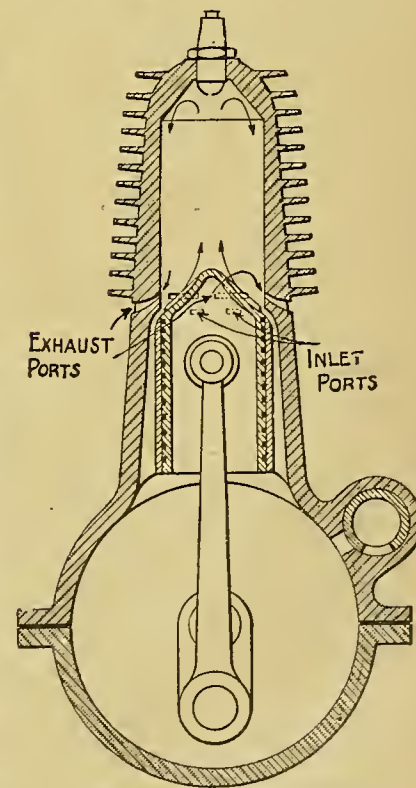
located by the clutch pedal. It will be recalled that the engine of this little vehicle is a small V four-cylinder two-stroke set at 90°, and has a 180° crank.

A NEW IDEA IN TWO-STROKE ENGINES.

A TWO-STROKE engine in which the exhaust ports form an almost continuous ring round the cylinder, and has, adjacent, a similar ring of ports for transferring the new charge of gas, has been patented by the Imhoff Motor Co., of Switzerland.

It will be seen from the accompanying diagram that the top of the piston is roughly conical in shape and is fitted with radially arranged ribs intended to guide the incoming gas to the centre of the cylinder.

The piston is shown as being fitted with a large number of rings. Excepting during the admission period of the fresh gases, one of the rings is always upon the cylinder wall between the two series of ports. This is to prevent the mixture being sucked into the exhaust slots. A rotary valve controls the induction into the crank case from the carburettor.



A two-stroke engine of Swiss design.



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

VALVE OPERATION.

Sir,—It may interest Mr. Pritchard to know I bought a J.A.P. 85×95 engine, as he illustrates, about 1909, and ran it for some years. Its faults were wearing of tappets and the noise; its advantages, impossibility of overheating, very high efficiency and economy, valve heads could not enter cylinder if broken, etc.

Why the firm ceased making it, goodness knows; for a better engine never ran.

A. E. PAYN.

Sir,—The letter in your issue of the 15th ult. by Mr. R. G. R. Pritchard recalls old memories. In 1910 I owned for a short time a locally assembled machine, built in 1904, with B.S.A. spring frame and originally 2½ Minerva engine hung on down tube. In 1905 this engine was replaced by a J.A.P., 82 bore × 76 stroke, overhead inlet and exhaust, both operated by one rod and cam precisely as suggested by your correspondent. The rod had a strong return spring, enclosed in the guide, which was of wide dimension. This old engine pulled well and ran very smoothly, but the ignition, being of the ancient battery type, with a most wretched contact breaker, festooned with wires, the engine never had a fair chance. In its heyday, however, this machine was considered rather hot-stuff, and, in some respects, was in advance of its time.

JOHN CONCHAR.

THE LEVIS CUP TRIAL.

Sir,—I should be glad if you would publish this letter to the effect that the disqualification of Mr. Greaves was one upon a technical breach of the rules, not involving any slur or discredit upon Mr. Greaves or upon his machine, the Calthorpe with Precision engine.

The Committee regret having to make the decision, displacing Mr. Greaves from first place, but rules are rules, and must be complied with.

PHIL. MOSEDALE.

Organising Secretary for the Sutton Coldfield and Mid-Warwickshire Automobile Club.

PETROL IN THE PEAK DISTRICT.

Sir,—This is for the benefit and warning of any of your readers touring on Sundays in the Peak District.

I left Sheffield for Buxton, *via* Middleton Dale, Tideswell, and Miller's Dale. On returning from Buxton I did not fill up with petrol, as I found I had sufficient in the tank to carry me to Bakewell; on arrival at Bakewell I called at a garage belonging to one of the principal hotels, and was told they had no petrol for sale, as they required all they had for private use, but, as I had just seen them supply a car driver with some this was clearly a get-out, and it is quite evident that motor cyclists are not encouraged at that garage. I then went the round of the town, calling at four other petrol dealers, and found them all closed, and I was told that they only opened on Sundays when they thought fit. As I had by this time only about a gill of spirit left to carry me to Sheffield, things looked pretty serious. However, I was then directed to Needham's Garage, where I received very different treatment, as, although they had no petrol in stock, they supplied me with all the benzole they had left (threequarters of a gallon), after which I went on my way rejoicing. I should therefore advise your readers not to rely on getting filled up at Bakewell.

ARNOLD E. WARD.

COASTING WITH THE EXHAUST VALVE RAISED.

Sir,—There is a very debatable question at present occupying the minds of motorists, and it is this:

When going downhill, with the exhaust lever fully raised, both petrol and air levers open, are the exhaust valves being burnt? Some contend that an explosion is taking place all the time, and is escaping through the silencer in the form of a blue flame. If this is so, what has one to do to get a current of air through the engine with the petrol lever closed, as both air and petrol go through the intake pipe. An expression of your readers' opinions would be interesting.

J. TAYLOR.



Ashton Court, Clifton, the venue of the Bristol Rally on the 21st inst. in connection with the A.C.U. first committee meeting in the provinces.

SPARE PARTS.

Sir,—*Re* complaints as to spare parts, I may say that I have ridden an Enfield combination for the last six years, and, as to despatch of spare parts, the promptness I received would take some beating. I had a small accident which called for a quantity of new parts. I rang the Enfield up on the Monday and received every consideration, and the parts were despatched the same day, fitted on, and the machine in use again. The usual disclaimer.

Birmingham.

Sir,—This is my experience of repairers. About three months ago I bought a motor bicycle which required attention to the engine-shaft. I sent the machine to a garage just before going for my Easter holiday, and on my return was informed that the shaft had been sent to the engine makers for renewal. After several letters to them, in a fortnight they informed the garage people that they could not deliver under three weeks. The garage people then sent a letter requesting the old shaft by return of post, as I could get one turned in a couple of hours. Although letters and telegrams have since been sent, they have not delivered the new or the old shaft.

I consider this far too long for a new shaft, and most discourteous not to return the old one.

Sheffield.

H.C.W.

Sir,—I have read in three of your different issues complaints about delay in delivery and "the usual disclaimer" about the promptitude of delivery.

In January I purchased a machine of well-known make. On April 8th I sent magneto (through my agent) back to the makers of the machine to replace broken shaft. This was nine weeks ago, since when I have heard nothing whatever concerning it, although I have asked for it to be returned as it is. My agent has written twice and I myself once, but we have had no replies.

DISGUSTED.

Glasgow.

MOTOR CYCLES FOR THE DISABLED.

Sir,—Much has been written recently on suitable machines for the disabled, and I think, perhaps, my experience will interest, at least, a certain section of your readers, especially those who, like myself, have a very limited purse, so that specially built machines with kick starts and other fancy contraptions are quite out of the question. War service has left me with a left arm about as useful as a missing rum ration, and is consequently nursed cosily away while the other does all that is necessary.

My mount is a 2½ h.p. two-stroke two-speed O.K. (an admirable little 'bus, in spite of its age), with fixed ignition, and just the right weight to handle single handed; and the following are manoeuvred with ease on the right handle-bar: exhaust lifter, front brake, air and throttle levers, and

horn; while the oil pump and gear are worked by the same hand, or the latter may be "slammed" in with the knee.

I might add that the machine is ridden in all weathers and traffic, and I am certain that any reader whose enthusiasm for motor cycling has been damped by infirmities, after the first mile or two, will gain sufficient confidence in the one arm to feel riding again a pleasure.

H.S.W.

Hitchin.

SCOOTERS.

Sir,—I have followed with much interest the discussion in your paper with reference to the motor scooter, and especially the controversy as to the fitting of a seat. As a keen motor cyclist who wishes to do what he can to forward the cause, in however humble a way, may I add my quota to this discussion?

I have seen it stated that the small diameter of the wheels accentuates the irregularities of the road surface. Surely this answers your question "Why Stand?"

For if one sits, with the roads in their present state, surely after a very short time there will be produced a condition painfully reminiscent of one's school days.

Winchester.

B.

MOTOR CYCLE PRICES.

Sir,—What you state with regard to the difficult position of the manufacturers is, unfortunately, only too true.

Although we do state, so far as quotations for L.M.C. machines are concerned, that we reserve the right to withdraw quotations without notice, we have all along executed orders for agents at the original price arranged, although subsequent alterations in price have been made. The only exception has been that we have reserved the right, naturally, to alter prices of stock orders agents may have placed, but this would not affect the public. In fact, we have taken steps which should in every case enable a purchaser who has paid a deposit to purchase his machine at the price originally arranged with the agent, i.e., the standard retail price current at the time of purchase.

THE LLOYD MOTOR ENGINEERING CO., LTD.

Sir,—Referring to the article under the above heading in last week's issue of *The Motor Cycle*.

We agree that raising prices without notice is a very hard rule, but, unfortunately, under present conditions, it is unavoidable. Increased prices of materials, also advances in wages, have not only to be paid without notice, but frequently retrospectively, giving the manufacturer no chance of recouping himself.

We are afraid it will be impossible to have fixed prices until more normal conditions prevail.

DOUGLAS MOTORS, LTD.,

WM. ROSSITER, Secretary.



A picturesque scene in the ancient village of Edge. The tower in the background was built to commemorate the battle of Edge, and is visited by thousands of motor cyclists in the course of a year. The scene shown was on the occasion of a recent trial held in the district.



A one-armed rider of a two-stroke Sun-Villiers, who lost his limb during the war, yet manages to manipulate his machine quite easily.

DISCOURTESY ON THE ROAD.

Sir,—On Thursday evening, May 22nd, I was riding my Rex combination, with my wife in the sidecar, to Bath Theatre, and when about four miles from Bath, on a hill known as Sally in the Wood, I saw an R.A.F. officer, obviously stranded with a motor cycle by the side of the road. I hailed him in the usual way, and asked him if he needed assistance, and on stopping found he had a nail through his back tyre, and no tools or repair outfit to effect repairs. I offered to help him for ten minutes, and he dropped his rear wheel out, and I helped him get the cover off. Being pressed for time, he suggested I might lend him my kit of tools and repair outfit, saying he was coming on to Bath and would bring them to any place I would name. I therefore told him to leave them at the theatre box office, but up to the evening of May 26th there was no sign of them.

The officer mentioned that a rider on a Triumph had passed him and laughed at his trouble, and I am thinking he is better off than I am.

This officer was riding an 8 h.p. Zenith, 1915 model, and was reading *The Motor Cycle*. He had of me a new large size Patchquick outfit, three tyre levers, and a large King Dick spanner.

I should be very glad if you would make mention of this in your next issue. It does not always pay to act the good Samaritan.

C.E.F.

Trowbridge.

Sir,—Mr. C. J. Williams is perfectly justified in asking that the old-time courtesy of the road should be re-established.

Previous to the war I rarely had to stop for trouble without some passing motor cyclist slowing down and calling out an interrogatory "All right?"

Since being demobilised in February last I have driven my combination about 1,500 miles, and although I have had

several stops for trouble, on two occasions only have passing motorists asked if they could assist me. One of these two, I might add, was the driver of a large car.

Only recently I was hung up outside Worthing with a puncture, and, although seven or eight motor cyclists passed, only one slowed down to ask if he could assist.

My experience during the past four months has made it quite clear that the pleasant old-time courtesy of the road has practically ceased to exist.

W.W.B.

Rusper.

AMERICAN TWINS.

Sir,—To accept "Ixion's" comments *re* American twins (issue of May 15th) as being "without animus" is somewhat of a "psychological problem," until one remembers the five-bob-a-time thrusts at John Henry; then one understands.

Many agents, with their tongue in their cheek, and their minds on the higher profit, gave the natural life of the Americans as twelve months. "Ixion" lends colour to this, and I suppose, when the Detroit duds begin to understand a little of steel alloys and heat treatment, they may possibly prolong their life by a month or two.

One of the most progressive and successful British twin makers, who is turning out what is "some" new model, is embodying many of the points decried by "Ixion," including the "semi-woolly" engine.

High compression, high efficiency engines have their supporters, but thermal efficiency rarely troubles the average rider, and American twin owners willingly allow useful calories to slide out of their exhaust pipes for the advantage of that "tick over" and absence of knock when climbing on top gear.

"Ixion," of course, is aware that it is the practice of American twins to seize up every few miles. What else could prompt his "mechanical lubrication of a kind"?

I may say that I eke out a miserable pittance by vivisection and holding post-mortems on the mechanical contrivances which are the primary subjects of your excellent publication, and I have yet to discover something that will commend itself to me like a certain Milwaukee production, yet when the like hails from the Midlands I will readily acclaim it.

GEORGE MAGGS.

A SATISFACTORY LIGHTWEIGHT.

Sir,—May I be permitted through your columns to express an opinion of what I consider an ideal motor bicycle?

I bought my machine second-hand for a figure which is very little in excess of what is very often given for an ordinary push-bicycle. It is an ultra-lightweight, scaling about 100 lb. I have ridden it for business and pleasure purposes for five seasons, covering upwards of 10,000 miles. I have never been hung up on the road. I have never attempted any freak hills, but rain road hills never trouble me, as, a variable gear being fitted, pedal assistance is seldom, if ever, required. The size and weight of my machine enable me to lift it in and out of an awkward gateway with comparative ease.

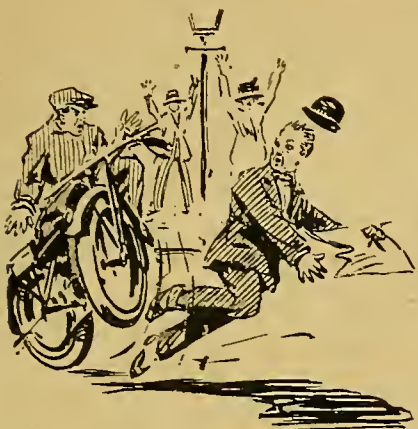
A jockey pulley takes up the slack of the belt when the gear is altered. People suggest that the jockey is a disadvantage, but I fail to see it, as the lower the gear is the more the Whittle belt encircles the pulley on the engine, and thus a better grip is given when there is climbing to be done.

My average speed is not thirty-five miles an hour, and I do not want it to be, both for my own sake and also that of others who have as much right to use the road as I have. I averaged just under twenty in a run from London to Norwich, and stopped once on the way to fill up the petrol tank.

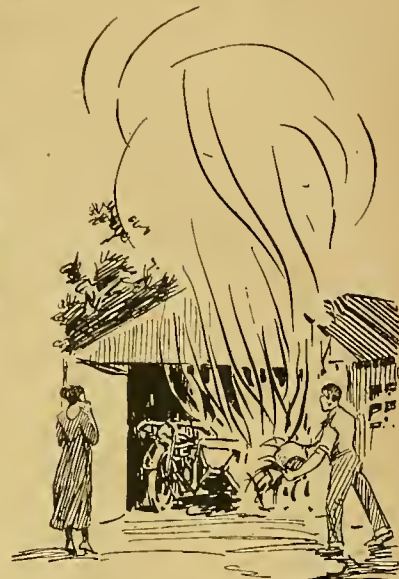
Finally, this old 1911 2½ h.p. Motosacoche takes me wherever I want to go with practical certainty. Although I weigh over 12 stone, on a long run I get 150 miles to the gallon, and starting troubles are practically non-existent. I very rarely have to run the machine more than three yards, or, if I wish, I can get a standing start with the aid of the jockey and free engine.

I attribute my success with this little "Motor Sausage" to treating it as a pal and not as a slave, tuning it carefully, renewing parts as they wear, and not trying to improve on the makers' design.

HAROLD WILLMOTT.



T. W. Loughborough, A.M.I.A.E.,
Secretary.



Are You Insured?

The mishaps that may overtake the most careful of motorists are numerous. It behoves every rider to insure both himself and his machine.

To encourage motor cyclists to take out a complete Policy under Table 3, such policy holders are admitted to full membership of the Auto-Cycle Union at one-half the usual subscription.

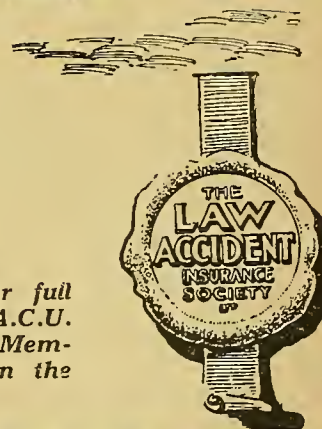
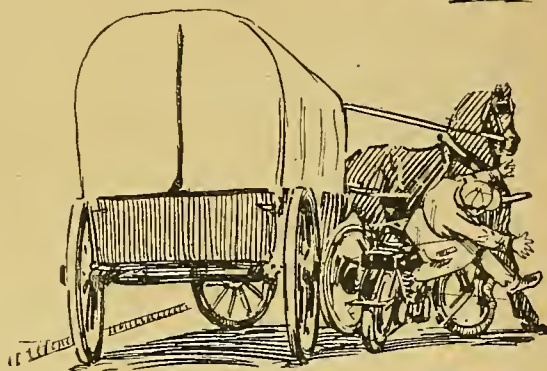
The A.C.U. Insurance Policy provides for every contingency, and its terms bring it within the reach of everyone who can run a motor cycle.

It is a straightforward contract, affording exceptionally generous benefits. Its conditions are stated clearly and without ambiguity; and you are invited to compare it in every particular with other policies.

The A.C.U. Policy is issued by the Law Accident Insurance Society, Ltd., a company of the highest standing; who have agreed that in the rare event of a dispute between themselves and a Member of the A.C.U., the decision of the A.C.U. Committee shall be final.

THE AUTO-CYCLE UNION,
83, PALL MALL, LONDON, S.W.1.

Telephone: Regent 5350



Write to-day for full particulars of A.C.U. Insurance and Membership.—Fill in the Coupon NOW.

Inquiry Coupon

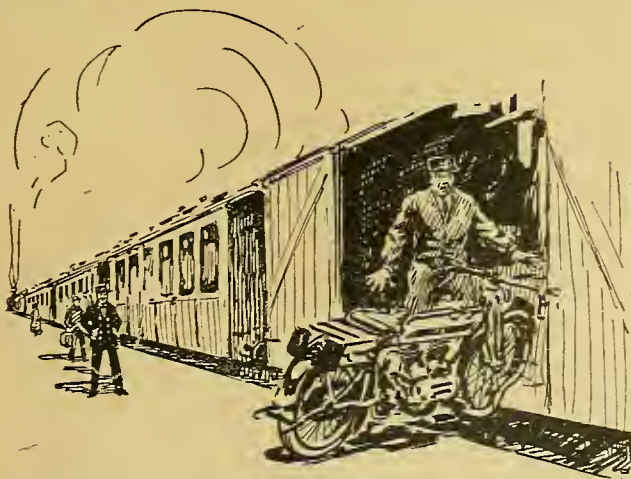
The Secretary,
AUTO-CYCLE UNION
83, PALL-MALL,
LONDON, S.W.1.

Please send me further particulars regarding the advantages of becoming a member of the A.C.U. together with Application form for membership.

Name.....

Address.....

"The Motor Cycle," 12/6/19.



THE INSURANCE POOL,

24, MOORGATE STREET, LONDON, E.C.2

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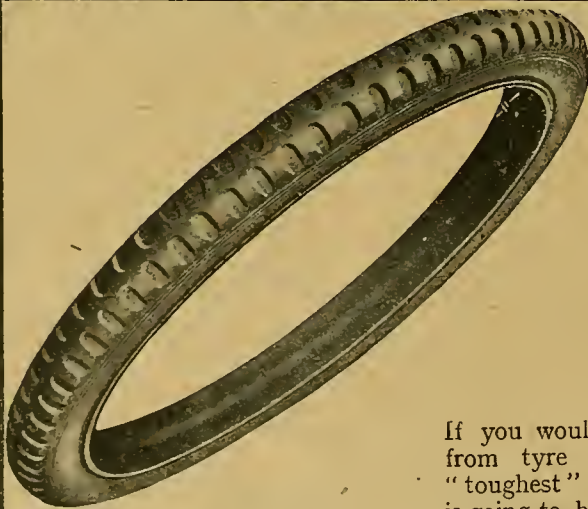
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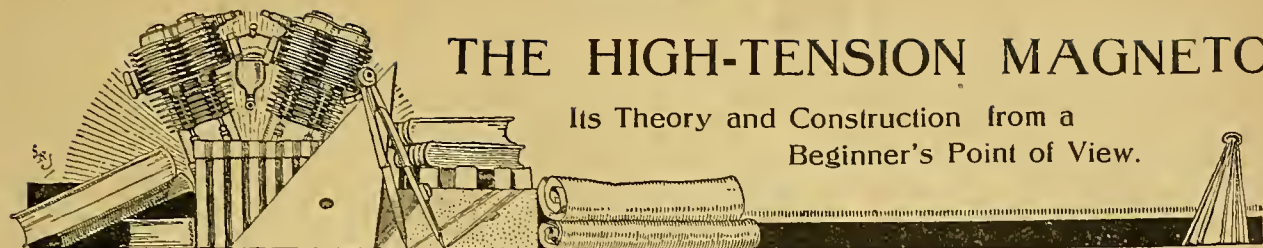
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THE HIGH-TENSION MAGNETO.

Its Theory and Construction from a
Beginner's Point of View.



NUMEROUS articles have been written dealing with the construction and the theory of operation of that most interesting machine, the high-tension magneto. The descriptions, or explanations, given by most writers usually come under one of two headings—either they are extremely technical, and are understood only by the electrical engineer, or they are so very practical that the actual theory of operation of the machine is given a wide berth, presumably to avoid puzzling the reader.

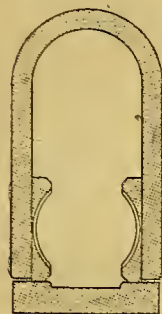


Fig. 1

Considering that everything depends upon the proper functioning of the magneto, it is surprising the apparent lack of interest on the part of motor cyclists concerning this really wonderful little machine. But for its advent, the evolution of the motor cycle would not have progressed to its present stage, as more than half the troubles of the early motor cycles were connected with the ignition apparatus. To-day, although the least understood part of the machine, probably it is the most efficient.

This article is written in an endeavour to make quite clear to those possessing only a slight knowledge of electricity exactly how the high-tension magneto generates the high voltage necessary for

is most unique, it is still quite simple and understandable by any practical mind.

Apologia.

The explanatory matter is devoted exclusively to magnetos of the revolving armature type, as the majority of magnetos in use to-day are constructed upon this principle. Also, the writer is of the opinion that, if the working principle of this type is once comprehended, the operation of any other type becomes obvious upon examination of the machine. It is, perhaps, needless to point out that magnetos, while designed by electrical engineers, are simply components of a much larger and more complex class of machinery, which is designed and built by the mechanical engineer, and, as the satisfactory performance of the internal combustion engine is so largely dependent upon the quality of the ignition apparatus used, it behoves the designer, builder, and operator of this class of prime mover to acquire as much knowledge of the construction and operation of the high-tension magneto as possible.

In attempting this explanation the writer has taken the liberty of departing more or less from the orthodox text book style, and in some cases has quite ignored scientific reasoning, in an endeavour to make the explanation as clear and as understandable as possible.

The Parts of a Magneto.

The high-tension magneto of the revolving armature type consists of:

(1) The magnet system (fig. 1), comprising one or more permanent magnets and two soft iron pole shoes or pole pieces. These pole pieces are shaped to embrace:

(2) The armature (fig. 2), which consists of a soft iron core laminated in the centre and of the usual H shape or shuttle

type. This core has two windings wound upon it. One, called the primary, is wound next to the core, and consists of about two hundred turns of copper wire about .023in. in diameter. The second winding, called the secondary, is wound over the first, and contains from 7,000 to 8,000 turns of copper wire, usually about .004in. in diameter. The greatest care is necessary in insulating these windings, as the voltages are very high, and the space for insulation is limited. The inside end of this secondary winding is connected to the outside end of the primary winding. This serves as an earthing connection for the secondary. The outer end of the secondary winding is connected to the slip ring or collector, and from here the spark current is con-

veyed by means of a collector brush and connection stem to the spark plug. To the ends of the armature core are screwed and dowelled two end plates made from some non-magnetic material, usually gun-metal. One end plate is hollowed out, and in this cavity is placed:

(3) The condenser (fig. 3), consisting of a large number of thin tinfoil sheets separated by somewhat thicker sheets of high-grade mica. Alternate sheets of tin-



Fig. 2.

jump spark ignition, and the writer wishes to state here that, although the high-tension magneto, as a machine,

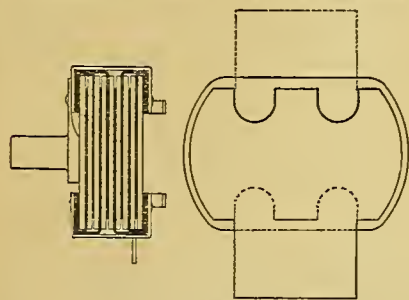


Fig. 3.

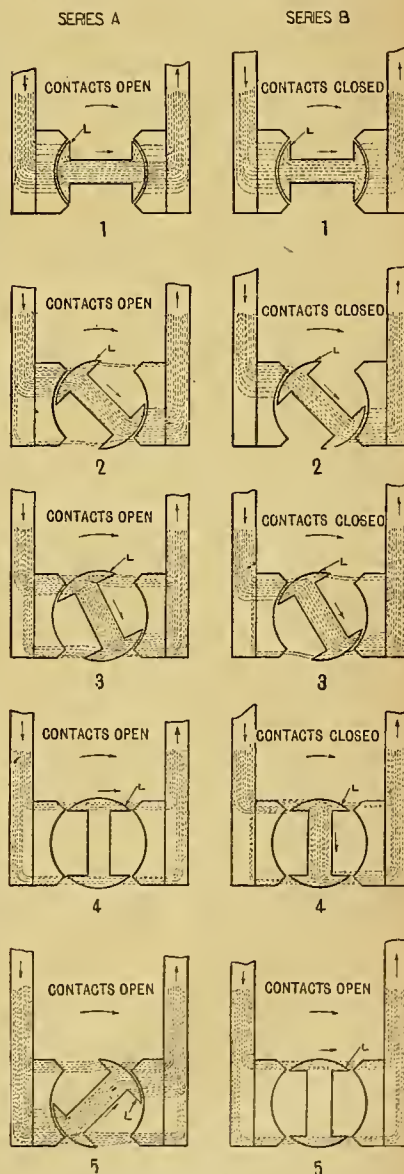


Fig. 4.

The High-tension Magneto.—

foil are connected together by means of the tabs, as shown, thus giving a large plate area in a small compass. The mica plates with the tinfoil sheets between are assembled into and clamped there by two sheet brass clips. These clips make electrical connection with the tinfoil tabs, and thus serve as terminals for the condenser, as well as means for holding the assembly together. One of these brass clips has a small ear or tab projecting from the side, which, in the majority of magnetos, is simply fastened to a step in the condenser end case by means of a small screw, and serves as an earthing connection for one terminal of the condenser, and, in some makes of magneto, also for one side of the primary winding and the inside end of the secondary winding.

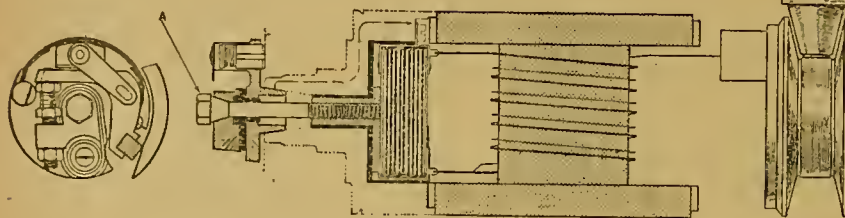


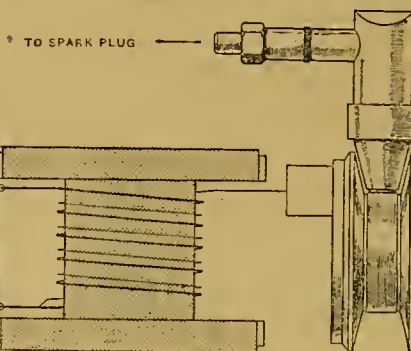
Fig. 5.

Note.—Some types of magnetos have the inside end of the primary winding earthed right to the armature core, this type of construction making it unnecessary to bring out both leads of the primary winding.

The opposite condenser clip makes electrical connection with, and by means of being riveted to, a gunmetal base or plate on the back of the condenser. This base has projecting from its centre a stem, which passes through an ebonite bushed hole in the condenser end plate spindle. This stem makes electrical connection by means of a screw A (fig. 5), and the screw also serves to hold in position.

(4) The contact breaker, which consists of a gunmetal base with a hollow tapered projection on its rear or bottom face. On this base is mounted the necessary contact making and breaking mechanism, which interrupts the primary circuit at certain intervals during the rotation of the armature. It will be noted, by referring to the semi-diagrammatic layout of the armature and its components, that when everything is in order the armature, together with the condenser and contact

breaker, form one rigid assembly, which rotates within the carcass or frame of the machine. The bearing bracket at the contact end of the magneto carries a sleeve, which may be oscillated in a rotational direction through an angle (in the majority of magnetos) of about 30°. This sleeve carries the cams, which are simply pieces of case-hardened steel, semi-circular in shape, and chamfered off at the ends. The oscillation of this sleeve carrying the cams permits of advancing or retarding the point of ignition. The cams project from the inside surface of the oscillating sleeve, and engage at certain intervals the rocker or movable



arm of the contact breaker. By this means the contact breaker points are opened at the proper times. At other positions, when the rocker arm is not engaging with the cams, the contacts are held together by a spring.

The Electrical Circuit.

In tracing the path of the current we find, first of all, that the ends of the primary winding are connected to the two condenser terminals or clips, and that one of these clips is connected to the condenser end case and through the metal of the case to the base of the contact

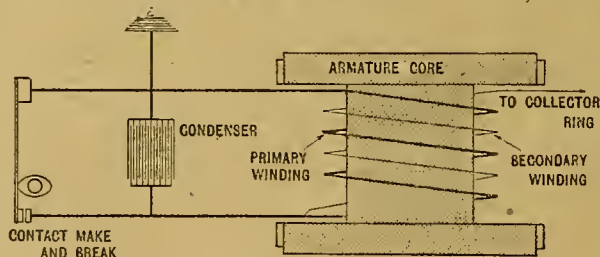


Fig. 6.

breaker. The other condenser clip and terminal combined makes connection with the centre block of the contact breaker via the gunmetal condenser base and the contact breaker retaining screw A (fig. 5). The outline of this circuit can thus be represented by the simple diagram (fig. 6).

Note.—The diagram shows that the contact breaker short-circuits the primary winding, and that the condenser is connected in parallel with the primary winding and the contact breaker. Now, suppose the coil of wire represented by the primary winding to be rotated in a magnetic field in such a manner that the flux or magnetic lines of force passing through the centre of the coil is constantly varying from zero to maximum, back to zero, reversing and rising to maximum again, and so on continuously. Obeying the fundamental law of the generation of an electro-motive force, there will be a current set up in this primary coil which is constantly varying both in direction and magnitude as the armature revolves. It is important to note here that the current flowing in the coil (primary winding) is only present when the contact breaker points are closed. When the contacts are open there is no current flowing in the winding, but because of the coil continuously cutting lines of force due to the rotation of the armature, there is an e.m.f., or potential difference or voltage, present across the contact points. This e.m.f. is constantly varying in polarity and magnitude as the armature revolves.

It is a fundamental fact that, whenever a current flows through a coil, there is a magnetic field set up by the current, and if the coil does not contain an iron core the strength of this magnetic field is proportional to the value of the current flowing. If we add an iron core the strength of the magnetic field produced by the current is enormously increased, this increase depending upon the quality of the iron.

Now, as the armature revolves in a magnetic field, and, as we have just learned, if the contacts are closed, the armature also has a magnetic field of its own, there must be some distortion or displacement in the permanent magnetic field produced by this second or created field. In the attached diagrams two conditions are presented.

(To be continued.)

READERS' ROAD REPORTS.

WEEK by week we publish reports as to the condition of the roads sent to us by readers who go to this trouble for the benefit of their fellow motor cyclists. The following are culled from this week's mail bag:

We are informed that the road from Bristol to Gloucester via Thornbury is in a very bad condition, and motor cyclists are advised to take the road through Chipping Sodbury, Old Sodbury, and Nailsworth.

A reader's report of the London-Exeter road: London-Exeter road via Dorchester.—London to Guildford good,

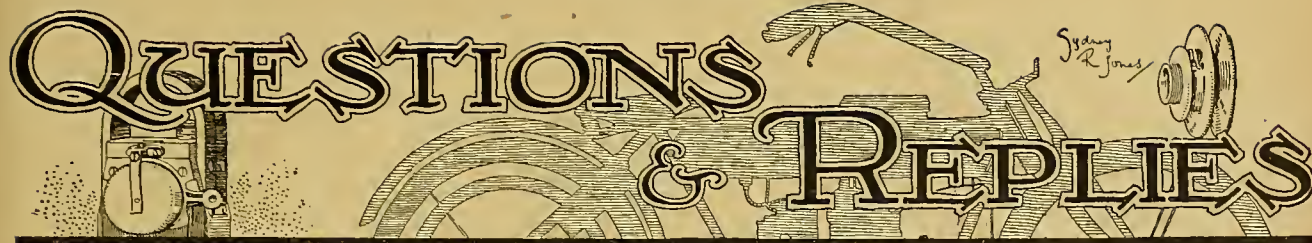
rough through Farnham, loose on to Winchester. From Winchester through the New Forest road fairly good, but loose in places; bumpy into Dorchester. Dorchester to Bridport full of pot-holes; Bridport to Lyme Regis very rough, and the condition of the steepest hills is very bad, so bad that near Lyme Regis the silencer touched the ground and a piece was torn off the end. Lyme Regis to Seaton fairly good. The road back to Town, via Chard, Crewkerne, and Yeovil, is very much better.

Main road Dollar to Stirling: Badly cut up and patched with tarred chips.

Loaninghead-Glenhead road through Gleneagles: Very rough.

The roads in the South of Ireland, in Counties Tipperary and Waterford, are in excellent condition. This applies also to byroads; but in Limerick, Clare, and parts of Cork they are reported to us as not being fit for horse-propelled vehicles, not to mention motor vehicles. Our informant also tells us that garages, except in the cities and one or two large towns, have no experience of motor cycles, or else do not wish to be bothered with them, but the inhabitants generally are very well disposed toward tourists.

QUESTIONS & REPLIES



A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C.4, and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

The Treatment of Belts.

? My machine is a 5-6 h.p. Rudge Multi, and to save the wear and tear to which rubber belts are subjected I have started using a leather belt, but find that it will not grip on the pulley while ascending any gradient. Is there any special treatment that has to be given to leather belts before using them? If so, I shall be very grateful for the information.—W.B.

The belt is probably not sufficiently tight. It possibly has also got dry and hard, and the surface needs to be scraped and then well soaked in collan oil, obtainable from most saddlers.

Timing a Twin.

? I have timed the magneto of my 6 h.p. twin Rex in different positions but it will only fire in the front cylinder, with occasional explosion in the silencer from the back cylinder. When at top speed it picks up better, but it is almost impossible to reduce speed without the back cylinder ceasing altogether. Can you kindly suggest any reason for this?—C.S.

You should remove the rear plug and note whether you get a spark on revolving the wheel. It is sometimes advisable to have the plug points in the rear cylinder set slightly wider than those in the front. Try changing over the plugs, also see that there are no air leaks in the induction pipe, that the valve guides are not much worn, and examine the carbon brushes.

Misfiring at Slow Speed.

? I have recently purchased a new 2½ h.p. Calthorpe-Jap motor cycle, fitted with an Amac carburetter, and have now driven it 300 miles, but I find I cannot cure bad misfiring on both gears at slow speeds or when running light down hills. There is no sign whatever of misfiring while climbing hills, or while gathering speed, or when travelling at twenty miles per hour. I have tried jets from 24 to 30, and three kinds of plugs, but with no effect.—W.A.

Without actually seeing the machine it is very difficult to say what is the matter with it, as the symptoms described may be attributed to a variety of causes. For example, improper carburetter adjustment, air leaks at the carburetter or induction pipe unions, leaky air or throttle slides, worn inlet valve guides, etc. Perhaps a little larger jet might cure the trouble. Try setting the plug points a little wider apart.

Magneto Trouble.

? Would the magneto sparking at the points cause the spark at the plug to occur at the wrong time for firing charge? My Douglas has been laid up two years and will not fire petrol squirted into the cylinders, although there is a good spark at the plugs. I have taken contact breaker off and find insulators all right.—A.W.G.

Your magneto sparking at the contact breaker suggests that the condenser is broken down. This trouble, however, should not cause any alteration in the timing of the spark, so before doing anything further you should check the magneto timing and clean the condenser connection.

Buying for Another.

? I was asked by a friend (a novice) to go with him to inspect a 4 h.p. 1912 motor cycle and sidecar which he considered purchasing. I examined the machine, which was in a very dusty condition, owing, the owner informed us, to his not having had time to clean it. Everything seemed to me to be in good order, and he gave me a short run in the sidecar. On my recommendation, my friend paid a deposit to secure the outfit. Two days later the owner gave my friend a lesson in driving, and, after his paying the remainder of the money, let him take the machine home. I was not present on that day, but the day after, intending to go with him for his first run, I was seated in the sidecar, and discovered that the tube from the seat-pillar was broken right through where it enters the socket on the crank case, also that it had been welded either by the late owner (who on being shown the break, which was an old one, denied all knowledge of it, or of sharing the expense of having it repaired) or by some amateur. It seemed to me as though the break had been covered by the clip band that carries the pump, and that the vibration must have caused the band to slip off. Your advice on the matter would be greatly esteemed.—W.J.T.

Whether the purchaser of the machine can recover any damages from the seller depends upon what representations were made when the machine was purchased, and whether the purchaser relied upon such representations. If there were no representations he cannot have any claim, and even if there were it might be very difficult to claim, as apparently he did not rely upon any such representations but

desired you to advise him as to whether he should purchase the machine or not. Apparently you advised him to the best of your ability. If you did not receive anything for the advice we do not think anything could be claimed from you because the advice was bad; but if any charge was made, then you would be liable if the purchaser could say that the advice was given negligently, and without proper care. At the same time it must be remembered that the machine was second-hand, and one cannot expect guarantees with such mounts.

Repairing a Two-stroke.

? I have a 2½ h.p. Levis on which the exhaust pipe joint blew out. I got some ½ in. sheet asbestos and made a new joint, but when I tried to start the machine again it would only just puff and not go, and made a terrible knocking sound. The oiling system is all right, and it is not over-lubricated. I have cleaned the carburetter, but it seems to flood at the bottom.—J.L.

It looks very much as though you had cut the hole in the washer too small, and it was restricting the outlet of the exhaust gases. If petrol runs out of the carburetter when standing, the level may be too high, the needle may require grinding in, or the float may be punctured.

The Attachment of Magneto Sprockets.

? My machine has been laid aside for over two years and I have begun to overhaul it, but have met with the following difficulty. I began by removing the aluminium cover from the gear driving the magneto, but I am unable to remove the two small wheels—one from the engine, the other to the magneto—which carry the driving chain; do these simply draw out or do they screw out? I note that the spindles are threaded, but apparently not for the wheels in question, or are they held on the other side? If so, how is the crank case removed? The engine is a 3½ h.p. 1912 Precision.—G.E.G.

The magneto chain wheels are usually held on a tapered shaft by means of a nut. It looks as if in your case the nuts had been removed at some time, and if this is so the sprockets can be withdrawn by means of a special tool made for this purpose, such as is supplied by Lake and Elliot, Ltd., Albion Works, Braintree, Essex, and such firms. Otherwise you may be able to remove them by gently tapping two wedges behind them.

Loss of Compression.

? I have a 1911 or 1912 2½ h.p. twin Humber, which has run very satisfactorily until this season. Now I find it has practically no compression at all. Would you tell me if there is any other cure for it than having the cylinders rebored, fitting new pistons, etc.?—S.T.H.

Presumably the valves are compression-tight? If you remove the cylinders you will probably find that the cause of the loss of compression is one of two things, either the cylinders are dry through the oil having drained away with standing, or the rings are stuck with carbon or congealed oil. In any case you will probably find that new rings, properly fitted, will cure the trouble. It would be as well also to check the tappet clearance.

Running on Benzole.

? I have a 4 h.p. Triumph on order, and intend partly to use benzole, which I suppose gives more power. Is this extra power harmful to the engine and transmission of a single-cylinder machine? If not, what proportion of benzole to petrol do you recommend? I believe two parts of benzole to one of petrol is very satisfactory. Is it necessary to decarbonise more frequently with benzole than with petrol?—L.K.W.

Benzole gives a little more power, and there is a complete absence of knocking. It is not harmful to the engine. An excellent mixture is two-thirds petrol and one-third benzole, or even half and half. It is just possible that you may have to decarbonise a little more frequently with benzole, though the carbon is soft and easily removed, but this may be obviated by ensuring an adequate supply of air.

A Composite Machine.

? I have the offer of an Indian motor cycle, and should be obliged if you would answer the following questions: (1.) The seller of the machine reckons it to be a 1911 3½ h.p. model. Is that correct? (2.) It has an automatic inlet valve. Is this serviceable, and could it be replaced if anything was to go wrong? (3.) It has a low-tension magneto, and has to be connected with a transformer to make the spark. Could I fit a modern magneto? (4.) There is a chain wheel of about 12in. diameter fitted on the crankshaft, and the drive is by chain to the two-speed gear box and belt. Is this serviceable? The belt pulley is at least 14in. in diameter. (5.) Would this machine pull a cane sidecar? I am only bothering with this machine because I regard it as a novelty. It has leaf springs in the front and is sprung at the rear by some style closely resembling the new Douglas. Do you think £20 about a reasonable price for the machine?—E.A.W.

We do not recognise the machine you describe as any standard make. It is certainly not an Indian. The automatic inlet valve is quite serviceable as far as it goes, but an engine so fitted is not as efficient as one with mechanically operated valves. You could certainly fit a modern

magneto. Chain-cum-belt drive is quite a good form of transmission for solo work. The machine should certainly take a sidecar. The present value of the machine depends entirely on its tune and general condition; it seems to be a machine assembled from second-hand parts and £20 should not be too little.

A Leaky Petrol Tank.

? (1.) I should be glad to hear if you would advise me to dismantle my petrol tank. On giving the engine a run in the garage, I noticed petrol leaking between the cylinder and crank case. I stopped the engine at once, and, on taking out the crank case plug, found it flooded with about a pint or more of petrol. The only way I can account for this is petrol from the tank leaking into the oil chamber, and to get at the leak the tank will have to be taken apart. I cannot see how this is done, as it seems all in one piece. (2.) My carburetter is giving me trouble. The engine used to tick over in free, but now it races and stops: how can I get it to run slowly?—C.W.

(1.) Evidently the cause of the trouble is a leak from the oil compartment to the petrol compartment. Do not attempt to repair the tank yourself, but either send it to an expert tank-maker or to the makers. (2.) The trouble is probably due to a choked jet or to an air leak at the carburetter or induction pipe union.

EXPERIENCE WANTED.

"C.E.C." (France).—A motor cycle engine used as the motive power for an electric light plant in a small house, or to drive a circular saw, etc.

INFORMATION AND ADVICE WANTED.**Questions for D.R.'s.**

(a.) Will some D.R. inform me what type of oil some of them are using out here in France on their Triumphs? On various occasions I have noticed the smell of oil strongly reminiscent of my aero "flips," which points to the use of castor oil. If this is the case, is it found satisfactory, and what quantity is used

to mix with the usual motor cycle oil? (b.) I have noticed the use of the old corrugated flexible rubber tubing joining the box respirator to its canister for a handle-bar 'grip. Looks effective; practically, is it good?—A.W.G.M.

READERS' REPLIES.

If your correspondent "A Constant Reader" in *The Motor Cycle* of May 22nd cares to write to me, I can give him some useful tips on low-tension magnetos, having used one for nine years on an old pattern Singer motor tricycle.—FRED C. KING.

RECOMMENDED ROUTES.**PLYMOUTH TO EGHAM.—H.R.V.**

Plymouth, Plympton, Ivybridge, Buckfastleigh, Ashburton, Chudleigh, Exeter, Honiton, Chard, Ilminster, Ilchester, Wincanton, Mere, Hindon, Wylde, Amesbury, Andover, Whitchurch, Basingstoke, Hook, Hartley Row, Blackwater, Bagshot, Virginia Water, Egham. Approximate distance 176 miles.

PRESTON TO ST. ALBANS.—H.E.H.

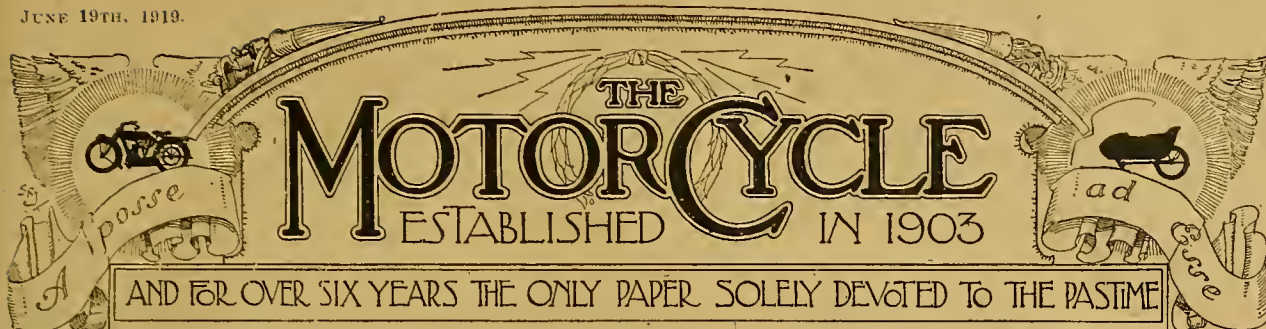
Preston, Wigan, Ashton-in-Makerfield, Warrington, Knutsford, Holmes Chapel, Newcastle-under-Lyme, Stone, Rugeley, Lichfield, Weeford (follow Watling Street through Fazeley, Atherstone, and Crick), Daventry, Towcester, Dunstable, St. Albans.

LEAMINGTON TO PENZANCE.—D.C.

Leamington, Wellesbourne Hastings, Ettington, Halford, Moreton-in-the-Marsh, Stow-on-the-Wold, Northleach (on left), Cirencester, Malmesbury, Chippenham, Melksham, Frome, Bruton, Sparkford, Ilchester, Ilminster, Honiton, Exeter, Moretonhampstead, Two Bridges, Tavistock, Gunnislake, Callington, Liskeard, Lostwithiel, St. Austell, Probus, Truro, Redruth, Camborne, Hayle, Penzance. Return: Penzance, Redruth, Mitchell, Indian Queens, Goss Moor, Bddmin, Launceston, Okehampton, Exeter, Culmpton, Wellington, Taunton, Bridgewater, Cross, Bristol, Gloucester, Tewkesbury, Evesham, Stratford-on-Avon, Warwick, Leamington.



The Wolverhampton branch of the N.M.C.F.U. at the foot of the Wrekin on the occasion of a recent run. This branch has been re-organised and now has the appearance of becoming an important section of the Union.



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Encouragement of Inventors.

IT is very desirable that fresh brains should constantly be brought to bear upon all motor cycle problems, for only in this way can rapid progress be ensured. The most revolutionary, and sometimes the most valuable, inventions are often made by men who are not connected, or even in close touch, with the industry to which the inventions apply. That this should be so is not in itself surprising. When the man who has been trained in automobile engineering is called upon to think of, for instance, a gear box, his mind naturally turns to orthodox practice, and he passes in review the many gear boxes, the standard models of various firms which differ indeed in detail and possibly in method of operation, but largely follow the same general principles. It is not, then, astonishing that he, having these examples—excellent examples, too—in mind, should turn to the improvement of existing design rather than to the production of something entirely new and original.

On the other hand, it is most important that an inventor who has ideas which he believes to be new should make himself acquainted with what has already been done in the same field; otherwise he may find to his sorrow that he has been wasting his time and energy on something which has already been produced, and possibly discarded for some reason not readily apparent.

A few years ago there was little inducement offered to inventors to proceed with inventions of which they possessed the nucleus. Neither the inventor nor his inventions appeared to be wanted by those with the capital to develop them, and there appeared very little return for any innovation except to the patent agent and the Patent Office.

The inventor, too, has suffered through lack of encouragement and advice, and here *The Motor Cycle* has, for many years, endeavoured to assist. The file volumes of this journal form a complete record of the development of the

motor cycle, and contain many hundred descriptions of patents and ideas of more than ordinary interest. It has always been one of the objects of the journal to encourage new thought in design and principle, and our periodical reviews of current practice and inventions are written with a view to assist, by constructive criticism, all who are interested in the evolution of the motor cycle.

The War Motors Association.

THIS journal has long urged that some scheme should be adopted to enable ex-officers and men to purchase motor vehicles from among those not required by the Government at a reasonable figure. The Auto Cycle Union, too, has done much valuable work in this direction. The War Motors Association, 240, High Holborn, London, W.C.1, has now been formed with this object in view. The Association has arranged with the Disposal Board of the Ministry of Munitions to purchase on the best conditions a large number of motor vehicles at reasonable prices. Only two and a half per cent. has been added to cover administration charges, and there is no question of profiteering.

The vehicles will first be sold to wounded and disabled officers and men to whom a car or motor cycle is a real necessity. It is not clear at the moment whether there will be any advantage in purchasing price to ex-members of the Forces, or whether they will enjoy a preferential opportunity of purchasing machines at market value. A technical committee is advising men as to the most suitable vehicles for their particular requirements, and gives practical assistance free of charge.

The Association is working in conjunction with all societies which have as their first object the welfare of discharged officers and men of H.M. Forces, and arrangements have been made with the Central Committee for the Employment of Discharged Soldiers and Sailors.

THE FAMILY SIDECAR

Its Influence on Social and Domestic Life.

THE outstanding feature of post-war motoring, undoubtedly, is the large number of family sidecars to be seen on the road. Irrespective of the power or date of the machines, sidecars of all types are made to accommodate whole families and, in addition, picnic equipment, enabling the party to be independent of restaurants.

What is more surprising, perhaps, is that, apparently, every member of these parties is comfortable, despite the fact that imagination prompts one to believe only a jig-saw can rival the intricate manner in which lower limbs are interlaced.

We have heard of families of two adults and five children taking a trip from the Midlands to Blackpool on $3\frac{1}{2}$ h.p. sidecars, and have listened with concealed amusement to the explanations of the owners as to why they were compelled to send "some of the luggage and the eldest boy" by train.

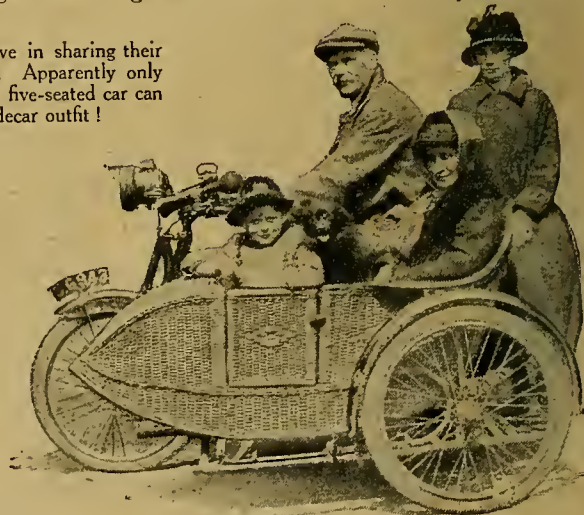
The reason "some of the luggage and the eldest boy" is not accommodated on a machine is usually because the limit had been reached as regards space, for with many of these family men it is space, and not power, that limits the load. The rider of the old school fits as light a sidecar as he can obtain if he uses a " $3\frac{1}{2}$ h.p." for passenger work, and has an uncomfortable feeling most of the time that he is not giving the engine a chance. Such thoughts rarely

trouble the family sidecarist of to-day—and it is a tribute to the two or three-speed motor cycle that things do not happen to compel these owners to consider their engines a little more.

Bearings wear more quickly, of course—depreciation is more rapid, perhaps; but, everything considered, the average family man obtains more value out of his machine than the more fastidious owner, and gives pleasure to the whole family, uniting man and wife and children with one common interest, which makes for domestic happiness.

Many of these family sidecars are owned by newcomers to the motor cycle fraternity, who reap the benefit of the pioneer work done by *The Motor Cycle*, which, for six years, ploughed a lone furrow in motor cycle journalism and so prevented the threatened demise of the industry when motor cycles were unpopular and unreliable. To *The Motor Cycle* campaign and the A.C.C. trials is due the change-speed gear as a general fitment on motor cycles, which

Happy owners who believe in sharing their motor cycling pleasures. Apparently only the accommodation of a five-seated car can excel that of a sidecar outfit!



The Family Sidecar.—

makes them suitable for passenger work. Less than a decade ago, a $3\frac{1}{2}$ h.p. machine was quite unsuitable for sidecar work, and, while we think that an engine a little larger is to be recommended when a sidecar is attached, to-day the average " $3\frac{1}{2}$ h.p." will not only "take" a sidecar, but the average family in addition—and do it well.

In addition to the week-end runs so popular with the family man, the machines usually are used to transport the family to the "sea-side" for the annual holiday, and this year undoubtedly we shall see large numbers of these outfits on the roads to the coast. A man with two children thus makes a substantial saving over the cost of railway fares, and the figures below form an average comparison.

Those motor cyclists who take the present-day motor cycle for granted owe their pleasure to a handful of pioneers—both riders and manufacturers—who struggled for years because of their faith that eventually the motor cycle would attain the popularity it enjoys to-day.

DISTANCE, 150 MILES EACH WAY.

	£	s.	d.		s.	d.
Return railway fares				Benzole for sidecar		
for two adults ...	3	15	0	at 75 m.p.g., four		
Ditto for two children ...	1	17	6	gallons at 2s. 9d. ...	11	0
Incidentals ...		5	0	Oil and incidentals ...	5	0
	£5	17	6		16	0



Seating a child on a hassock in the toe of a sidecar relieves the passenger of much discomfort.

As to the cost of running the outfit at the week-ends, it is probably true that it costs no more than the amount a man at a "loose end" will spend on recreations in which his wife and family do not participate.

No doubt sidecaring as a family pastime will do much to influence domestic happiness. It binds all—father, mother, and children—together with one common interest and prevents the disintegrated household one often finds, where each member of a family has to find his or her own amusement. A week-end on the road is a most valuable tonic to a tired woman, and breaks the deadly monotony of housekeeping that disgruntles many a worried wife and mother. The week-end on the sidecar with picnic baskets and children breaks up a long procession of 365 colourless days into five-day weeks of pleasant reminis-

cence and anticipation, each divided by full-of-incident journeys into country which otherwise they would rarely see.

Apart from the health point of view, the education of the children is improved, and they are better able to absorb their school lessons because their wits are sharpened.

In short, the sidecar is a real boon to the family man, and he is not slow to realise this. It behoves sidecar manufacturers to remember his special requirements when designing new models and to allow plenty of space and strength.



Four B.S.A. owners making the utmost use of their outfits. Eleven passengers were on this occasion easily conveyed on four outfits through the most beautiful scenery in Wales.

OCCASIONAL COMMENTS



BY "IXION"

The Life of a Machine.

AMONGST my consultants last week was a rural postman, recently discharged from the army. His savings, including the gratuity, were sufficient to buy a motor cycle. His round averages about 120 miles per week, and he is allowed 32s. per week for the expenses of transport. In pre-war days he used a horse and trap. The questions put to me were whether the 32s. weekly allowance would cover (a) upkeep and (b) the purchase of a new sidecar outfit every third year. It is curious that so many people arbitrarily set the useful life of a motor cycle at three or four years. The plain fact is, of course, that motor cycles should be classed with women's hats and frocks—they do not so much wear out as pass out of fashion. I know that certain fluffy confections of tulle and chiffon look shabby after half a season, but though their pristine grace may be lost, they could still serve their original purpose of covering heads or bodies as efficiently as in their first youth. In practice, of course the smartish sort of girl passes them on to her maid or a poor relation long before they are genuinely shabby. This is how at least five riders out of ten treat a motor cycle. They run the newness off it, and then dispose of it to a poorer and less fastidious owner; the next season finds them with a new mount. Here and there you may find an owner who compares with an ancient lady of much local repute in my county. Her clothes are bought to last. Her Sunday hat and mantle were built by a first-class dressmaker in the year one—indeed, her grandmother probably wore them at Queen Victoria's coronation. Every five years or so she adds a bit of new ribbon or a few jet beads, but the enduring substratum of both articles defies the march of centuries. A motor cycle subject to certain obvious conditions can be similarly maintained.

The Cheapest Way.

IF I were a rural postman with a gross capital of, say, £75, I should not dream of buying a new machine every third year. I should select a first-class machine of tolerably simple specification, produced by a firm which does not come out with revolutionary novelties every spring and possesses a good name for supplying obsolete spares. After twelve months the machine would have done about 7,000 miles, allowing for a little Sunday joy-riding. I should expect to renew the chains, and possibly to have the engine bushes attended to. At the end of the second season (say, 14,000 miles), the gear box and spring fork bearings might profit by an overhaul: any scaled or chipped enamel might be retouched to avoid rust: there might be a few spokes loose, and the wheels

might therefore be trued up and their rims enamelled: one or two Bowden wires should perhaps be replaced, etc. Each year would call for a few minor jobs of the above character, but, surveying the machine's probable record over a long term of years, I can foresee no really bulky replacements with two probable exceptions. The first is the cylinder; the bore would unquestionably become enlarged and ovality would develop; the effects would become serious after perhaps 20,000 miles, and I should then have to choose between re-boring it and fitting a larger piston (with the result that the engine must be rebalanced), or buying a new cylinder. The second is the front fork. I never heard of a trussed girder fork collapsing from fatigue of the metal; but after 50,000 miles I might elect to fit a new fork complete. Treated on these lines, the life of a first-class motor cycle is not to be reckoned in terms of mileage or years: it approaches the infinite. The vulgar notion that a machine becomes unsafe or excessively troublesome after two or three seasons is a fallacy. This fallacy is based partly on the extremely careless and amateur fashion in which many riders "maintain" their mounts, and partly on the fact that motor cyclists are a mildly moneyed class, able to indulge a flirtatious zest for mechanical novelties. Thus my postman friend can certainly save money out of his 32s. allowance, if he is man enough in 1922 to resist the temptation to buy a new season model fitted with a six-stroke rotary engine or a petrol turbine.

So Simple.

I HAVE neither seen nor tried the Ashton-Evans carette, but it is certainly a logical "break" in cycle cars. Low price does not admit of a four-wheeled chassis with a differential axle, so some designers omit a wheel, thus rendering the odd remaining wheel somewhat inaccessible: whilst others retain four wheels and fit a solid rear axle, against which the public nourish a real, if groundless, prejudice. The Ashton-Evans engineers retain four wheels, and use a solid rear axle only 8in. between hub centres. This certainly seems to be the best compromise yet evolved. I am naturally eager to try out this system on the road, and wonder that nobody has adopted it before. On the other hand, if the proposed selling price of £200 materialises, the newcomer must fight some formidable adversaries, for it is in the same cost line as the A.B.C. and Cosmos, which are conventional four-wheeled chassis. The real opportunity for the new type of frame is as a rival of the Morgan and A.C. Runabouts; with a simpler specification it need not exceed their costs by more than £5—a sum which many people would pay to secure the advantages of twin driving tyres and accessible back wheels.

THE IDEAL LIGHTWEIGHT—WHEN?

A Twenty-year Old Problem. Will the Scooter hasten the Arrival of the Genuine Lightweight? A Triangular Contest now Commencing.

PROPHETS have never tired of reiterating during the past twenty years that the only possible motor cycle of the future is the lightweight. Very probably they are correct, but in the meantime the mediumweight and the heavy-weight types of machine are enjoying much well-deserved popularity, and it must cause impatience to those who years ago gave up the motor bicycle because it was "too heavy and cumbersome" to observe the delay in the advent of the genuine miniature fool-proof machine. The ultra lightweight, which shall be entirely dependable, capable of going anywhere, and marketed at a reasonably low figure, must undoubtedly form the "mount for the million" when general developments enable such a type of machine to be marketed in quantities.

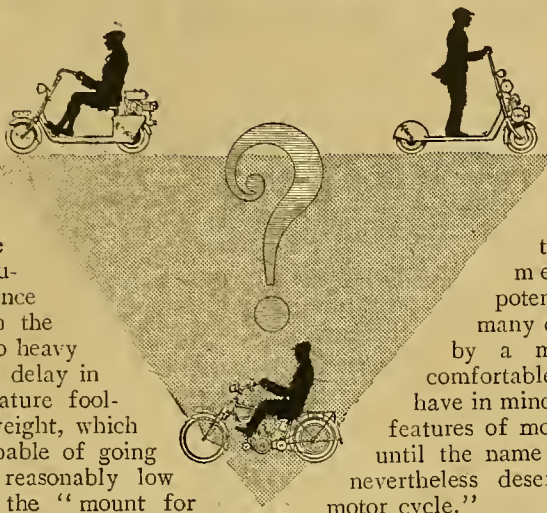
The Ambitious Specification of "The Million."

As a scribe who for more than fifteen years has been told time and again that anyone who pinned his faith to the heavy and powerful machine was on unsafe ground, I marvel greatly at the tardy arrival of the reliable miniature answering the pedal cyclist's requirements. But let it be emphasised that the specification laid down for the "ideal" is certainly ambitious. We are told that its mechanism must be entirely enclosed, the machine must be mud and weatherproof, it must have an open frame so that one may ride it with ordinary everyday apparel without getting soiled, it must climb any hill, require no exertion in starting, and finally be cheap to run and cheap to buy.

Very nice, too! the reader will remark, and a really attractive mount when it does arrive. How far are we removed from this ideal? *Not very far*—in the writer's judgment.

A Triangular Contest.

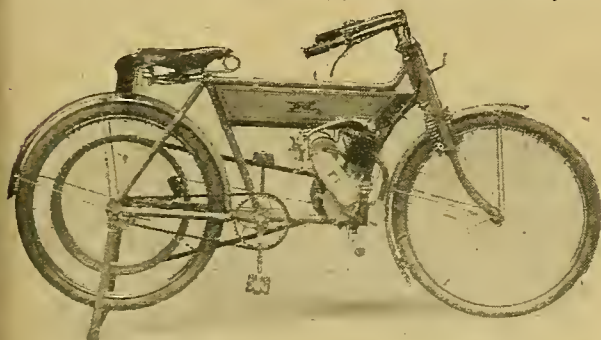
Hitherto attempts to satisfy the huge army awaiting such a mount have been by (1) motor-assisted bicycles,



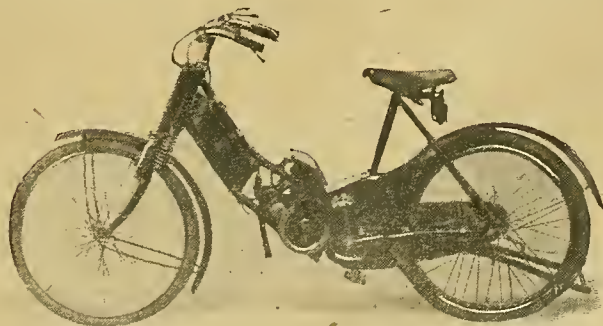
and (2) miniature examples of accepted designs of powerful machines. Now, however, a third competitor has entered the arena and seeks to attract the million. I refer to the motor scooter, but not the type with a "stand up" seat, which must take a back seat, to use a metaphor. Among the huge potential army of converts there are many elderly riders not to be attracted by a motor-propelled platform. A comfortable pan seat they must have! I have in mind the scooter embodying the best features of motor cycle design, but developed until the name scooter would discredit it, but nevertheless deserving of the term "miniature motor cycle."

Not a Mechanical Toy.

Any form of expensive toy enjoys but an ephemeral life; the original scooters are too limited in their range of action. The class of buyer to whom I refer as "on the brink" requires a mount that can be used for occasional touring, and not mere shopping expeditions. This type of motor cycle I firmly believe to be possible, and in the immediate future at a weight of 60 to 70 lb. Development in engine efficiency has rendered a tea cup-sized engine capable of serious hill-climbing with a fairly low gear. Since the war, the scientific value of the correct application of light alloys has become more generally and far better understood, so that we now await with confidence the enterprising manufacturer who will take advantage of modern developments, step in, and fill the breach. *Lightweights of 70 lb. or less, and costing under £30, we must have, for the thousands who annually find pedalling too laborious.* The triangular contest now commencing between manufacturers of (1) motor-propelled bicycles, (2) motor scooters, and (3) lightweight motor cycles at present weighing about 130 lb. must result, sooner or later, in the production of the miniature motor cycle for the million such as I have outlined. Which will win public favour in 1920? G.S.



The 90 lb. lightweight Wolf of 1909, a machine marketed at nineteen guineas, with a four-stroke engine having an outside flywheel.



The lady's model pacer, an ultra lightweight little more than a bicycle, fitted with a J.E.S. auxiliary engine, and weighing about 70 lb.

NO AGE LIMIT.

The Motor Cycle as a Suitable Mount for the Man of Mature Years.

TWO weeks ago we raised the query "Who is the oldest motor cyclist?" and in response to our invitation for these young-old readers to send us their experiences we have received many letters which endorse our opinion that there is no age limit where the motor cyclist is concerned.

Among these letters there are several from readers who are a mere fifty-five to sixty years of age. The average man may be "of mature years" at this age, but these motor cyclists are boys compared with their brothers of seventy and over.

Up to the time of writing, the oldest motor cyclists to our knowledge are two clergymen—the Rev. Edward W. Wilmott, Vicar of Cornish Hill End, Braintree, Essex, who is nearly seventy-two, and an Irish Canon, who prefers to remain anonymous, who is also in his seventy-second year. Mr. Wilmott writes:

"As a regular reader of *The Motor Cycle*, I am interested to hear that you are curious to know something about the ages of the 'old brigade.'

"Well, I bought my first cycle in 1867, and trundled it many a mile with its wooden spokes, wooden rims, and iron band. Of course, in time I took to pneumatics and multiple gears, and then when Sunbeams came, with the little oil bath, I transferred my allegiance to them, and have remained loyal to them to the present day.

"My present parish is in the depth of the country, miles from a railway station or market town, and so five years ago I turned my attention to motoring, and got a Sunbeam sidecar outfit. I began with a 2½ h.p., but though that might do for town work, I found it was of no use for the country and so changed it for a 3½ h.p.,

which, I find, gives ample power for all my work, while the sidecar provides for all passenger, station, parcels, or goods requirements.

"The Sunbeam cycle is still in daily use, though I do not, as a rule, use it for distances over fifty miles, but for business purposes and saving of time the motor is essential.

"If God spares me to live another three months I shall then be seventy-two, and every year increases my power of enjoyment."

A 72-year-old Sidecarist.

The letter from our Irish correspondent, who is another single-cylinder sidecar enthusiast, is given below:

"I am well into my seventy-second year, and by no means of strong physique or in vigorous health, and for the past six years have been riding a 4 h.p. Triumph with sidecar. I find it invaluable in my professional work as rector of a large country parish, and a constant source of enjoyment, as well as a means of health.

"My early experiences were a bit exciting, which is not to be wondered at when for a week or more I did not know that the way to stop quickly was to raise the lever handle of the exhaust valve, and my ignorance led me to charge straight into a wall at a fair speed, and I had besides a few mishaps at left-handed turnings too quickly taken, but such drawbacks soon became things of the past.

"As to cars, a friend of mine bought a large five-seater when he was about seventy-five, and declared his intention of driving it himself, to the dismay of his family and friends,

and on his first attempt overturned the car in the ditch. He had been a yachtsman in his early days, and gave this as his explanation of the accident: 'When I found myself with the wheel between my knees I thought I was on board the old yacht, and as I wanted the thing to go port so I turned the wheel starboard.'

"This, I fancy, must have happened in the history of motoring with others who, like my friend, had followed the ways of the sea in their youth. With him it led to his being content to rest upon the laurels as a steersman which he had gained afloat, leaving the guidance of a car for the future to the chauffeur."

Another reader over seventy years of age is Mr. John R. Marsh, of Wigton, Cumberland, who writes:

"I saw in a recent issue of *The Motor Cycle*, of which I am a regular subscriber, under the heading 'The Oldest Motor Cyclist,' you invite old cyclists to write to you.

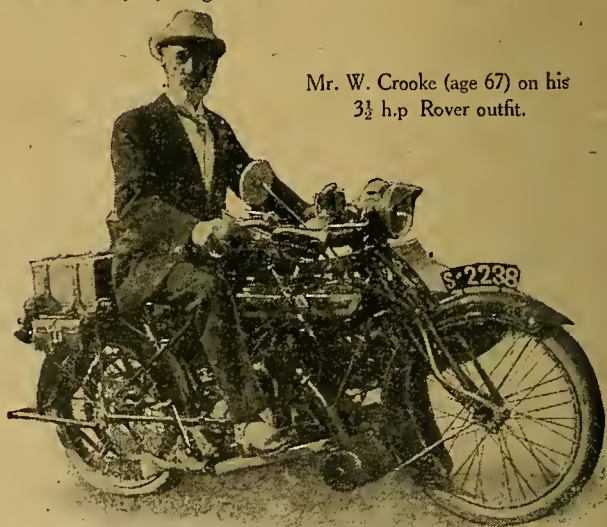
"I am over seventy and commenced riding a motor cycle fourteen years ago. My first mount was a 2 h.p. Humber, and I am finishing with a 2½ h.p. Levis—a gem of a motor cycle, which carries me anywhere. Between them, I have ridden a 3½ h.p. Triumph (belt drive, single gear) and a 4½ h.p. B.S.A. and sidecar on which I have several times ridden from Wigton to Newark in the day. I still hope to enjoy many years of motor cycling. I ride to and from business most days."

A sixty-seven year-old reader, Mr. W. Croke, writes from Edinburgh:

"I am now in my sixty-seventh year, and at present drive a 3½ h.p. Rover combination, which I find exceptionally easy to handle and very economical, as I get from eighty to ninety miles to the gallon of petrol. I commenced motor cycling in 1902 with a 2½ h.p. F.N. with flat belt drive. Since then I have had various makes, including Humber, V.S., and Enfield.

"It may interest some of your readers to know that I started my cycling career in 1874 on a boneshaker."

Mr. W. Croke (age 67) on his 3½ h.p. Rover outfit.

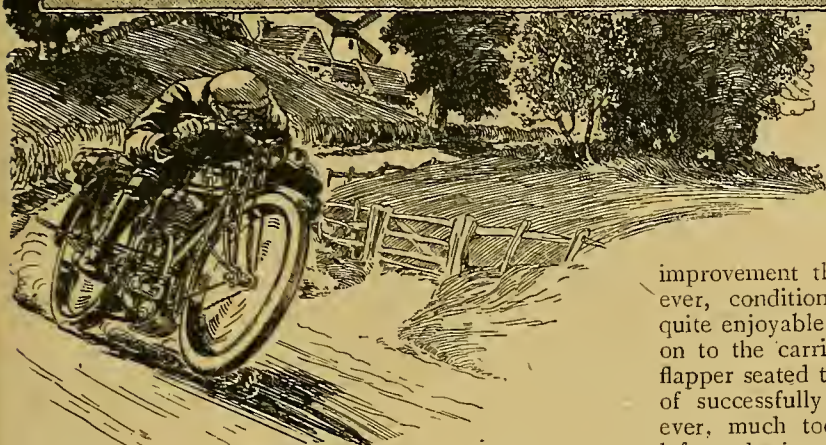


The Rev. E. W. Wilmott (age 72).



Mr. J. R. Marsh (age 70).

The Youthful Motor Cyclist.



WHY THE MOTOR CYCLE APPEALS TO THE YOUNG MAN.

THE reason for my intense desire to possess a motor cycle from the earliest days was always somewhat obscure. When the young school-boy sees a reckless driver swerving round a blind corner at a dangerous angle, he is always impressed, and at once feels the desire to be the proud possessor of one of these machines. The sporting instinct that is latent in every boy comes to the surface, and reveals itself in the wish to accomplish something that appears not only dangerous and exciting, but a feat that will attract attention and surprise the onlooker. It is this sense of daring publicity that at first unconsciously appeals to the juvenile rider.

Initiation.

My first machine was a $3\frac{1}{2}$ h.p. Rudge-Multi. The neatness of this machine, however, did not satisfy me, and my chief desire was to transform it immediately into a noisy, racy-looking mount, regardless of the makers' design. The exhaust pipe was naturally one of the first things to be removed, and a large copper one was fitted. The exterior appearance, noise, and style of the machine are not all-important, but it gives considerable pleasure to the young motor cyclist to lean dangerously over the back of the machine and hear the roar from a carefully-constructed exhaust pipe.

To make quite certain that the exhaust was satisfactory I employed some boy friends, with large ears, who congregated at the appointed spot on the chosen route, to carry out the noise test.

A sense of lordly predominance crept over me, and as I approached the excited faces with ears strained to catch the growing roar of my exhaust, I carefully affected the correct racing attitude as I dashed by, to return a hero, and receive the glowing praises from my little group of admirers. Many of these tests were carried out until it was unanimously agreed that the noise was perfect and would surpass that of any other machine in the neighbourhood.

Long-distance touring never appeals very much to me. Preparing a route to arrive at a pre-arranged destination and return by another way is devoid of excitement. I maintain that a machine can be more instructively appreciated when the road work constitutes a form of test upon some new adjustment or

improvement that has been fitted. There are, however, conditions under which touring can be made quite enjoyable: by the addition of a cushion strapped on to the carrier of the machine, and the customary flapper seated thereon. The details of the best means of successfully arranging these excursions are, however, much too complex to explain, and should be left to the ingenuity of the individual.

A small workshop is desirable, sufficiently equipped to enable the rider to effect any small repair or adjustment. The greatest fun can be found by continually adjusting the tappets, the magneto, and valve timing gear, and fitting different sized jets, experimenting with various mixtures of fuels, and carburetter adjustments, such as a home-made design of induction pipe, air intake, and carburetter heating device. Very little machinery is necessary: a small Drummond lathe, a vice, and set of useful tools, are quite sufficient to tune up or rebush any part of the machine. A motor cycle is never perfect in the eyes of us youngsters, and the wet and dull days can be spent in a very instructive and interesting way by experimenting with any of these fittings. The sporting machine offers a very wide scope for indoor amusement; and, when the next suitable day arrives for outdoor riding, there is always something engrossingly new to be tested, which not only affords constant amusement, but prepares the machine for the forthcoming trials for which the enthusiast will enter.

Another of the many reasons why I like the motor cycle is the fascination of speed trials and hill-climbs, and I think that one of the best conditions under which a speed trial can be carried out is on a wide stretch of sand. Although the small disadvantage created by the fine dry sand entering the exposed parts of the machine is annoying, sand offers a good surface for speed tests, especially if it is slightly damp.

Exciting Competitions.

During the summer months I spent many happy week-ends at a seaside resort on the West coast, where a five-mile track of sand, damped by the ebbing tide, was popularly attended by enthusiastic motor cyclists; and after a pleasant run from my home, about thirty miles distant, an impromptu race on the sands, with an equally powered machine, combined with the attractive scenery of the pleasure resort, formed a most exhilarating recreation. The pastime, in my opinion, would be very dull were it not for competitions and hill-climbs, which are usually very amusing. A considerable amount of practice is required to compete with professional riders, but the practice that is necessary affords some exciting and enjoyable hours.

The Youthful Motor Cyclist.—

I have found that much amusement can be obtained by what might be termed "scientific" riding. Considerable skill is required to take, successfully, a sharp bend in the road at sufficient speed to reach the standard required in speed trials or hill-climbs, and a most enjoyable hour or so can be spent by practising this difficult task. A corner having a soft grassy bank on the near side is the most suitable, and much more comfortable, as the inexperienced rider is bound to have a number of falls, resulting from bad judgment of the angle at which he can ride his machine.

The centre of gravity of the machine should be as low as possible to hold the tyres to the road. This,

however, can be considerably aided by the riding position affected by the driver. Thoroughly to enjoy the qualities of a machine of this type, all superfluous fittings and gadgets should be removed. A speedometer, throttle, and ignition controls only, should adorn the low T.T. handle-bars which are essential to allow the rider's body to form, as near as possible, a stream-line or anti-wind resistance position.

The pastime under these conditions is both inexpensive and enjoyable, and the proud owner of an efficient motor cycle of this kind always has the satisfaction of knowing that his machine is in the best possible state of repair and capable of doing any kind of work at any time. B.



SUMMER DAYS AMID THE SAND DUNES.

No summer would, of course, be complete without a holiday by the sea, and no holiday complete without those delightful picnics with the "old 'bus" to assist in finding the ideal spot.

The Picnic-Basket and the Sidecar.

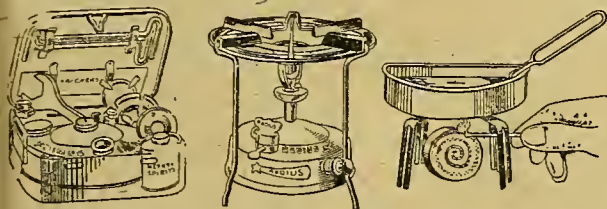
Hints and Tips
as to its
Contents and
Accommoda-
tion.



A Useful
Guide
to Motor
Cycling
Picnic Parties.



THE picnic basket has now become an almost essential part of the sidecar equipment, and it would not be surprising if designers of 1920 machines more seriously consider the question of its accommodation. Provision is usually made to carry a petrol tin. There are two pannier bags and a locker under the passenger's seat for tools and spares, which we rarely use, and many sidecars have a grid to carry luggage; but, so far, the picnic basket has not entered into the accommodation plans of the sidecar.



(Left) The Primus portable spirit stove. (Centre) A similar type—the Radius. (Right) A convenient lighter, which boils half-pint of water and costs 10½d. per dozen.

Naturally, to those who have luggage grids which are supported by the springs and not on the chassis itself, these means, unused excepting for tours, will be considered as suitable for carrying the picnic basket. Provided the basket is in a dustproof cover, the grid solves the problem; but such a cover must be dustproof, as the majority of picnic baskets are not. Even the cloth or leather outfit is not impervious to dust if placed in an exposed position: hence it is necessary to cover the picnic equipment if carried on the grid.

This cover may be a made-to-measure case of waterproof material, having a close-fitting "lid" completely enveloping the sides. Another means of protecting the contents from the dust is to wrap the basket in a waterproof sheet, which is useful as a ground sheet when picnicking after a shower of rain, or may be used as a canopy as illustrated above.

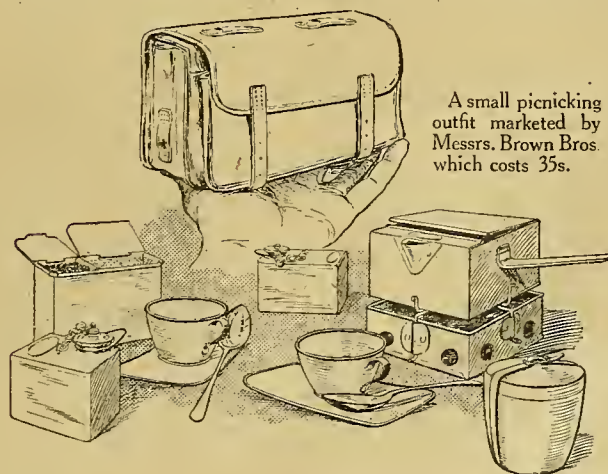
When a single passenger is carried in the sidecar, space for the picnic basket may be found on the floor of the car, but the average sidecar is not sufficiently large to do this without robbing the passenger of her or his comfort. If the equipment must be carried

in the sidecar, it will be found more convenient to split up the paraphernalia, the stove, kettle, and cans being packed in the tool lockers, the plates, etc., in a strong leather case, and the eatables in small biscuit tins which can be distributed on the floor of the sidecar. This, at the best, is only a make-shift arrangement for the motor cyclist who has not a sprung grid.

A Miniature Pantry.

Since the majority of motor cyclists who picnic are family men and, in addition to their wives, take their children along on their jaunts, the equipment required increases as the spare space decreases; thus, with the family sidecar, a sprung grid is a real necessity, unless the designer of the sidecar has made proper provision for the picnic equipment within the body itself.

We recently saw a sidecar with a rear locker, which the owner had converted into a miniature pantry. The sidecar was of the type having a locker in the rear panel. The well of the locker was used to accommodate the stove, water, fuel, kettle, and tins for eatables, and the lid was equipped with a canvas envelope, in which were fixed knives, forks, spoons, and small "odds and ends." The top space of the locker was fitted with a detachable rack,

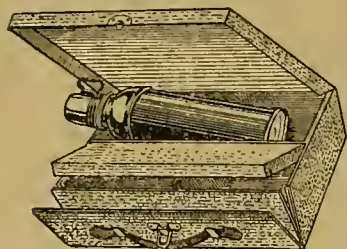


A small picnicking outfit marketed by Messrs. Brown Bros. which costs 35s.

The Picnic Basket and the Sidecar.—

built of three-ply wood with leather partitions for four plates, saucers, and cups, a teapot, and two screw-top glass bottles for milk.

The owner of this very complete outfit assured us that, although "china" plates, cups, and saucers



A small case for a vacuum flask and sandwich tin, costing 18/9, from Dunhills, suitable for solo riders.

were always used, he had not broken any of them during 2,000 miles of touring.

On this point, probably, the majority of motor cyclists will find enamel ware more suitable than "china," until makers fit up sidecars with a "miniature pantry at the rear" as mentioned above, but another alternative is

to use paper cups, etc., such as are sold by Selfridges. This paper ware is by no means expensive, as will be seen from the following list:

Cardboard cups 2s. 11d. and 3s. 11d. per doz.
Paper table cloths, 30×30in., 6d. each.
Cardboard plates with grease-proof lining: 9in. 1s. 2d. doz., 8in. 10½d. doz., 7in. 7½d. doz.
Salad dishes, 10×7in., 2s. doz.
Square dishes, 6½×5½in. 10d. doz., 7¼×6¼in., 1s. 1d. doz.
Creme paper serviettes 2s. 6d. per 100.

Picnic enthusiasts are divided when it comes to the question of cooking in the open. There are many who prefer the conveniences of the vacuum flask to the spirit stove or camp fire. The vacuum flask allows hot or cold liquids to be carried, and undoubtedly is a great convenience, but with a spirit stove a hot meal is quite practicable, and several meals may be partaken without replenishing the lockers.

All the same, vacuum flasks are extremely useful, even when a stove and kettle are carried.

Useful Details.

British-made Isola vacuum flasks sold by Dunhills and Gamages range in price from 10s. 6d. to 21s. 9d. for the pint size, and from 21s. 9d. to 41s. 6d. for the quart, according to the type of casing. The firm named also catalogues refills at —s. 9d. and 13s. 6d. respectively, while a leather case for the pint flask, with a sandwich case, is listed at 18s. 9d.

Several suitable spirit stoves are obtainable from such firms as Brown Brothers, Dunhills, Gamages, and Selfridges, of which the Primus probably leads on the point of popularity. This well-known heater may be obtained in a "pocket" size metal case (5½×4¾×2½in.), with a three-hours' burning capacity for 37s. 3d., while larger sets with an eight-hour capacity are 53s. 3d. and 66s. 9d.

A cheaper wickless stove, known as the Radius, is marketed by Gamages at 29s. 6d. This is col-

lapsible, and contained in a tin case measuring only 6½×5½×3¼in. Another model of the Radius, which is not portable, costs 27s. 9d.

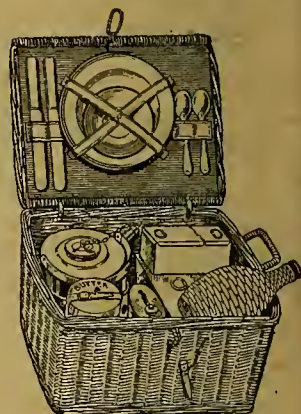
To those who require something very much cheaper the "Rapid" cooker will be of interest. This is catalogued by Gamages, and takes the form of a self-contained lighter capable of boiling half a pint of water. Sold in boxes of twelve, complete with stand, the price is 10½d., and they should prove useful in any picnic equipment as an auxiliary cooking apparatus.

As regards complete picnic baskets, these are obtainable from all the firms mentioned above. Brown Brothers sell a very neat satchel, which will appeal more particularly to those who ride on single-track machines, either alone or with a passenger on the pillion. It is exceptionally neat and compact, and can be carried on the handle-bar or slung over the shoulder. The price is 35s., and the outfit is very light and compact, as will be seen from the illustration on the preceding page.

Compactness is a very important point concerning picnic baskets to be accommodated on the sidecar; therefore, to give some idea of average sizes, we give below a few dimensions and particulars as to contents, which may be a guide to those who are not yet equipped. For two persons, Gamages sell a tea basket containing kettle, with screw lid and spout, tea infuser, wind guard, lamp, and spirit container, wicker-covered milk bottle, tea and sugar canister, biscuit box, enamel cups (two each), saucers and plates, butter jar, knife, and two teaspoons. The size of this outfit is 12×9×7in., and the price 36s., while for four persons the size is 14×12½×7in., and the price 49s.

Prices and sizes vary according to equipment and make: therefore, when the space available is ascertained, it is advisable to obtain catalogues from one of the firms we have already mentioned, when a basket of the desired size, equipment, and price will, in all probability, be found.

Properly equipped for *al fresco* meals in the open, the motor cyclist is independent of restaurants, which at holiday times are generally overfull. In addition to its greater convenience, a picnic in some well-chosen spot and at some well-chosen moment enhances the pleasures of motor cycling to an extent little realised by those who do not travel "self-contained."



A useful size of picnic basket suitable for a sidecar. The size is 13×10×8, and it costs about 45s. from Dunhills and Selfridges.



A dustproof envelope covering a picnic basket on the sprung carrier of an A.J.S. sidecar.

Tendencies in Design.**More Consistent
Quality.****Sprung Frames.**

IT would hardly be an exaggeration to say that the motor cycle industry is in the melting pot, and that a year or two must elapse before anybody but a prophet can decide what the outcome will be. I am not thinking first or principally of the commercial aspects. Neither am I thinking of the price question, though eventually keen competition, followed by over-production, may result in at least a temporary cutting of profits, whether Ford flings his gauntlet into the arena or not. I refer specifically to the more technical features of the gigantic struggle which is slowly developing before our eyes. At least three novel types of machine are tilting against the old conventions. There is the motor scooter, which claims to supersede the standard machine for short distance utilitarian work. There is the simple four-wheeler, represented by the Grahame-White buckboard, and by at least two other quads which I wot of: these presumably cater for people who dislike the single track machine—do not crave for speed, and perhaps desire more protection.

A Big Fight Ahead.

Then the new Douglas and the A.B.C. suggest that the speedster and sidecar merchant can have their desires fulfilled at a revolutionary weight limit. In the face of these and other less sensational challenges, many of the older designers remain mute for the moment. They may have sensational retorts in preparation, or they may feel that such innovations contain no perils for the conventionalist school. All we can say is that up to the present some of our most experienced makers preserve a dignified calm: they continue to list and sell the type of 'bus which was familiar in 1914.

In this welter of projects and possibilities, there is only one certainty: a big fight is ahead. Within two years the issue will be clarified. At the moment nobody really knows whether the old school will come out on top, or whether the scooter, the monocar, the Ford cycle, and the fear-nothing mediumweight will revolutionise design and production.

This review of the uncertain factors can now merge into a consideration of items upon which no dispute is possible. First of these I should rank the subtleties of engine design. Beyond all question the motor cyclist's chief bugbear in the old days was distortion. Most 1919 engines preserve their truth after ten miles of full throttle: so they need less oil, they carbonise less rapidly, and they maintain their tune longer. Whatever size or type of engine may be established in our favour by 1920, we may reckon on its embodying these indicated improvements. It is obvious that the two-stroke and the bijou engine with little or no reserve power receive enhanced opportunities as a consequence.



**Automatic Carburettors
Mechanical Lubrication.
More Silent Machines.**

As the second certainty, I should select a vast advance in the average quality of the engines produced by a given firm. Once upon a time we all took it for granted that each batch of

one hundred engines emanating from a factory contained perhaps

- 1 star engine.
- 4 first-class engines.
- 92 common or garden engines.
- 3 duds.

The star engine was kept for the firm's trade riders; the first-class engines went to picked customers; and the duds punished the secret sins of various unfortunate buyers. By 1914 one or two leading factories had almost, though not quite, contrived to level up their output; but engineers whose names were household words could still regard the undulations of the test bench as a profound mystery. In sober fact the aberrations were a mere matter of sloppy workmanship. If you use .001 in. gauge you get excessive tolerances: a "maximum" shaft is fitted in a "minimum" bearing, and the resultant engine will not rev. But if your gauges narrow fits down to .001 in., your engines attain a dead level of excellence, and need no running in. Munition work has taught the less careful firms the value of closer workmanship, and the progress hardly adds a cent to the cost. The result is that the star engine has vanished out of the best factories: in a batch of 100 there are no divergences worth notice; when the works manager requires a "stunt" engine, he does not ask his testers to keep their eyes open; he just designs a few special parts.

The Universally Bad Roads.

The third certainty is better springing. It will be something of a disappointment. I have the luck to live in a district where cast iron pot-holes are unknown; good as my local roads are—so good that a rigid fork and frame were never intolerable—a fully sprung frame of sound design made motor cycling absolutely velvety in 1914: but to-day I bump a little. In 1914 I pitied the unfortunate resident who rode a rigid rear frame in a knobbly-road district, and thought how the advent of spring frames would impress him. Well, it would not. Our roads are now so universally bad that in 1914 an average road plus an average frame spelt much the same comfort as an average road and a good 1919 spring frame spell to-day. But there is this about it. With the vile roads which we now perforce accept, sprung frames are a sheer necessity. Incidentally, rear springing is an educator. It teaches its owner to identify and to loathe a bad front fork. In 1914 we blamed the back wheel for the shocks and vibrations from which our tender bodies suffered. In 1919 we can track some of these miseries to their true home—viz., a dud spring fork. We must wait a year or two before we can hope for perfectly sprung light-

Design in 1919.—

weights: existing springing designs are mostly on the heavy side.

In all probability the three improvements detailed above will be common to all the new stuff. It remains to consider items of less universal application. Of these I hope that electric lighting for solo machines will be the top spot. The perfect acetylene generator has not yet been invented; all existing types hold small charges and are messy to clean. Give us a spill-proof battery, which is not too big and will not buckle under heavy discharges, and our lighting troubles will be over. Suitable dynamos and lamps abound; I believe this year will bring some of the right batteries along.

Every practised rider knows how mounts vary in respect of steering. I have driven a Triumph hands off at 45 m.p.h.; I have owned other machines which wanted manhandling round every corner, and wobbled fearsomely at speed. This year I have already tested two or three machines which seemed almost to steer themselves.

Transmission Troubles.

Transmissions vary enormously. One make may have a rough drive, rattlesome chain cases which take hours to remove and replace, a clutch which either would not come out or would not grip, a chain adjustment which entails resetting the clutch and gear controls, inaccessible gear box hangers and lubricating plugs, and other defects. Others run as smoothly as a billiard ball on well worn nap. These variations are slowly being levelled up.

I know there are two opinions about automatic carburetters, but I fancy so many riders want them that all makers will soon fit them as options, if not as standard. The flowmeter method of gauging jets will average up carburettor settings, and the old anomaly under which machine No. 1,012 gave 85 m.p.g. and machine No. 1,013 gave 100 m.p.g. is doomed. I cannot help thinking that aero engines will beget light motor cycle carburetters as soon as aluminium grows more plentiful again. We need no longer buy 100 yards of insulating tape with each new machine, for induction unions are receiving very necessary attention.

Lubrication is a thorny point to tackle when current practice differs so enormously. It ranges from the hand pump with its boa constrictor gorges at the rider's discretion, to the out-of-sight, out-of-mind systems which merely require replenishing with a gallon every eight weeks. When doctors differ, an amateur must tread warily. It is undeniable that one or two designers scrapped the drip feed after lengthy trials because they found that the heavily-loaded bearings did not wear so well when subjected to a steady oil feed at a low rate, and

deprived of the periodic cold bath of fresh oil. But the position has changed. At the time when several firms scrapped the drip feed, phosphor bronze bushes were the rule; given perfect workmanship, this type of bush wants a lot of oil, and many factories used to rely perforce on second class labour, whilst their methods were not of the most accurate. To-day we have better methods, more skilled labour, and phosphor bronze bushes are yielding to ball and roller races which demand far less oil. As a personal opinion, the sump and submerged pump type of lubrication will make good; we have long sighed to get rid of the monotonous responsibility of operating a hand pump, a system which disappeared from cars fifteen years ago. Perhaps the time has come at last; if so, it means pleasanter jaunts, a cleaner tank top, and more petrol capacity. Talking of tanks, the leakproof petrol tap is here, and also the three-way tap, which keeps a pint or so of fuel as an emergency reserve.

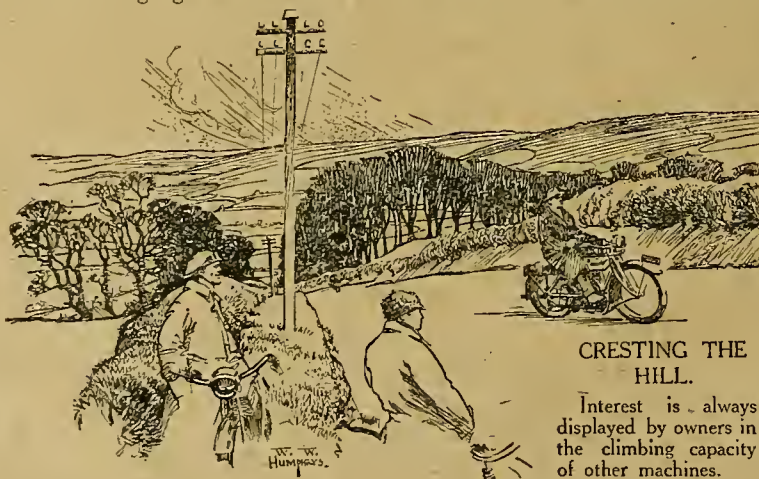
Future Tendencies.

The show will tell us whether machines are growing more cleanly and more cleanable—two quite distinct points. There is an obvious tendency to fit under-shields, and a few designs include furlable screens for keeping off the mud flung up by the front wheel. These gadgets are advantageous, but do not go far enough. If the power unit above and behind these screens resembles a heap of spillikins, the machine may be cleanly, but is not cleanable. The ideal surely is that if the front wheel and forks of a motor cycle are removed, the breastbone of the remaining portion should resemble the bows of a boat, and that the mechanism inside the "keel" should be guarded against mud, rain-rust, and dust by light aluminium panels or other defences. We have not got as far as this; the new designs are cleanly, but the devices which make for cleanliness often render the machine less cleanable. Still, it is something to be able to ride a quarter of a mile in trousers without getting thoroughly bemired.

The word "clean" is also used metaphorically to denote shapely lines and a smooth exterior. In this section there is nothing to report. Handle-bars are still nickelled *chevaux de frise*; the hooter and the speedometer dial continue to upset the steering balance. Festoons of external control wires, sparsely confined

by pinch-on clips, decorate the steering head as gaily as ever. Tanks are getting cleaned up a little, but many are still as hard to dust as a bent iron girandole or silver filigree. Crank cases ditto, as a rule, with a few blessed exceptions. The bottom bracket region remains a filth trap.

The perfect motor cycle wheel is still uninvented. The old Olympic standard of a plated hub, plated



CRESTING THE HILL.

Interest is always displayed by owners in the climbing capacity of other machines.

Design in 1919.—

spokes, plated rim, with a red, green, or blue decoration, is still paramount. But crawly progress is evident in flirtations with discs, in black hubs, detachable wheels, first-class stands at front and rear, some provision for coaxing a released wheel in and out of place, better chain cases, brakes which do not seriously interfere with tyre repairs, and other minor advances. It should be noted that for sidecar work a big tyre run rather soft is a splendid insulator; of course, on solo mounts a big tyre must be inflated pretty hard to prevent "roll."

Main Features of Interest.

On the broad question of silence our world is as sharply divided as Sinn Fein and Ulster. But one forward step should be chronicled. In former days, the man who loved a crisp, penetrating bark could make a dual defence. On the one hand, it might be alleged that a silent machine is apt to be dangerous; on the other, that he preferred the smack of hot gases

on the startled air to an orchestra of squeaks and rattles and whirs. The *ensemble* of mechanical noises emitted by the modern machine is being hushed. Valves, timing gears, transmission, springing details, and minor fittings are being quietened. The day is coming when the mechanism of the motor cycle will be quite reasonably quiet, and the matter of silencing the exhaust can then be discussed on its own merits.

To sum up the position, my eye picks out three main features of interest:

(i.) A marked and universal improvement in engines, divisible into higher efficiency and greater maintenance of tune.

(ii.) A pending struggle between old types and newcomers.

(iii.) A widespread attention to the perfecting of every conceivable detail.

The next show and the next year thus promise to be quite the most interesting in the history of the motor cycle world.

B. H. DAVIES.

A COMBINED TRIAL AND TOUR.

A Competition designed to Encourage New Members of the Bristol M.C.C.

THE members of the Bristol Motor Cycle Club were favoured with delightful weather for their opening trial and tour to Land's End. Out of 20 entrants 14 faced the starter, which, considering that the majority were new members, was considered exceedingly satisfactory. The Trials Committee framed the conditions with a view of making the event more of the social rather than competitive order. A number of non-competing members of the club followed the trial throughout.

Several new models were in evidence, notably the 6 h.p. Douglas shown on page 625, a 3½ h.p. chain-driven Norton, a 1919 Sunbeam, and a 1919 model W.D. 2¾ h.p. Douglas. The former machine from the Douglas works is an attractive looking outfit.

The new model Norton in the hands of A. W. Walker was also a much admired machine.

The following competitors completed the course to schedule time and secured gold medals:

W. J. Wotton (3¼ Sunbeam).
G. S. Gerrish (6 Enfield sc.).
H. N. Walker (3¼ Norton).
Eli Clark (4 Douglas sc.).
D. W. Dyer (4 Douglas sc.).

W. Thornhill (2¾ Douglas).
H. Thorpe (2¾ Douglas).
W. W. Moore (6 Douglas sc.).
R. W. Oliver (7 Indian sc.).
I. L. R. Large (2¾ New Imperial).



W. Thornhill and his 1919 2¾ h.p. Douglas starting in the Bristol-Land's End trial. Thornhill was a competitor in the 1914 T.T.

The Motor Cyclists' Parliament.

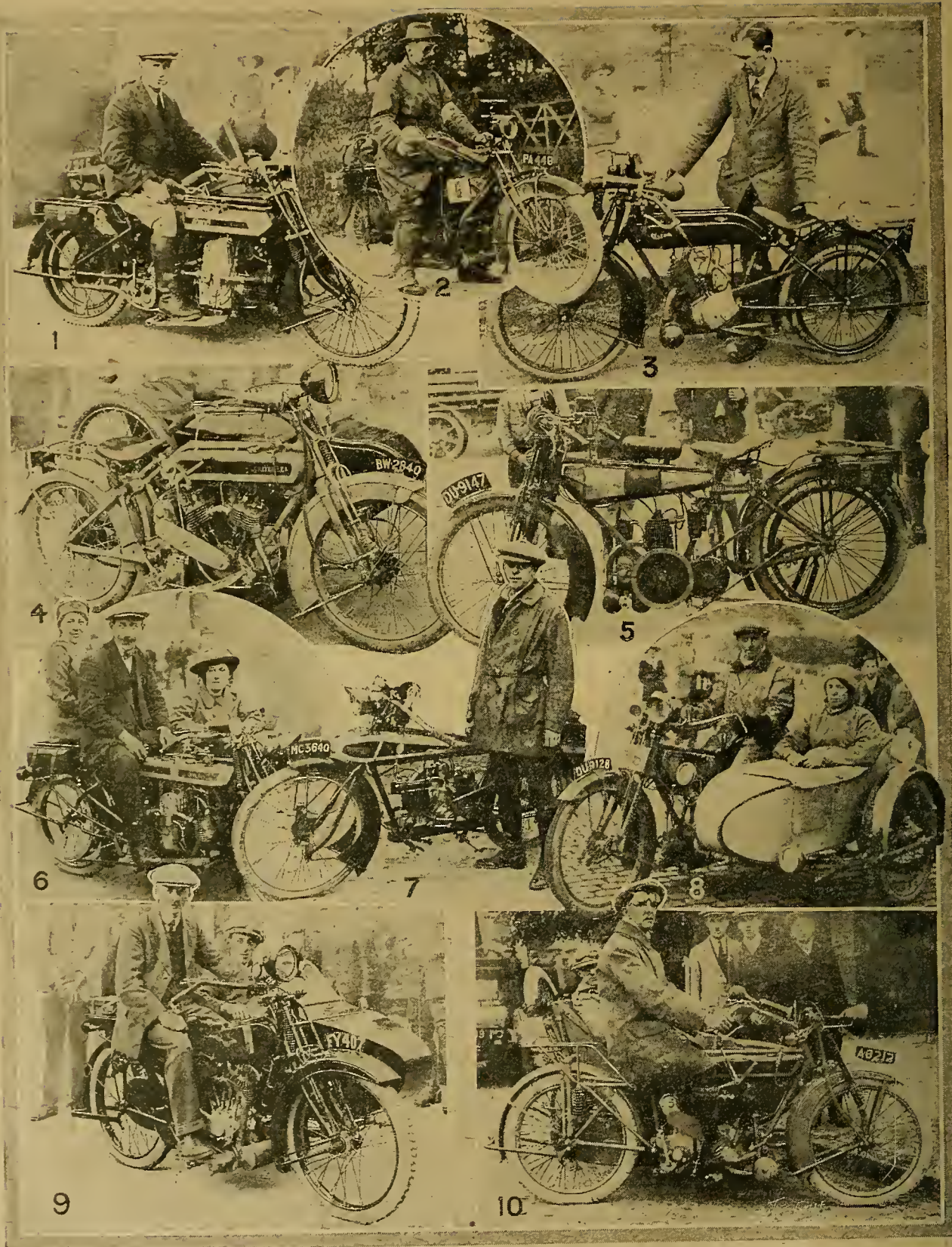
First A.C.U. Committee Meeting in the Provinces. A Great Meet of Motor Cyclists Expected at the Bristol Rally.

THE first General Committee meeting of the A.C.U. to be held in the provinces will take place on Friday, the 20th inst., at Bristol, and it is anticipated that the western City will do everything to make the visit of the Committee a pleasant one. The Committee now consists of representatives of the sport and pastime from many districts, and the meeting will be one of more than usual interest on this account.

Great efforts are being made by the Bristol M.C.C. to organise a "big Bristol meet" of motor cyclists

for the following day. As already reported, Ashton Court Park has been loaned by Lady Smythe, a good orchestra has been engaged, and a souvenir hand book is in preparation. As many new and "advance" models will be on view, it is expected that a large majority of West of England riders and others will be present.

If the interest in even ordinary machines displayed by the public is any criterion, the Bristol Big Meet will be a success.



SOME OF THE NEW MODELS IN THE LONDON-EDINBURGH RUN.

(1) 5 h.p. Brough. (2) 3 h.p. A.B.C. (3) 2½ h.p. Clyno. (4) The new spring frame 8 h.p. Chater-Lea. (5) A spring frame lightweight—the Hobart. (6) A 3½ h.p. spring frame Douglas. (7) The flat twin Wooler. (8) The new "Model 77"—Rex single. (9) One of the new 8 h.p. Clynos. (10) An 8 h.p. spring frame Matchless.

WHERE TO GO FOR A TOUR.

Places of Interest and Beauty in
many Counties easy of Access
to the Motor Cyclist.



A FAMOUS YORKSHIRE CENTRE.

NOT many districts provide the variety of scenery of Upper Wharfedale, the land beloved by Leeds and Bradford motorists, basking as it does in an atmosphere of old-world quietude, yet so easily accessible from a host of crowded centres. The coming of the tourist has not spoilt this land, endowed by nature with beauties she has used as sparingly as gold elsewhere, for here, from the valley heights, we have the miles of dead level moorland road—dead hard, dead straight, and dead deserted, where the writer has sorely tried the speed capabilities of many a worthy mount for discussion in these pages. Try,

for example, Penny Pot Lane, near Blubberhouses, or, leaving Otley, ignore the main valley road, and, passing over Otley Bridge, take the road to Blubberhouses, round two awkward corners, and on to Greenhow, then sharp to the left, striking Appletreewick or Hebden as you choose. If time is no object do not miss Bolton Abbey Woods. They are the very essence of Wharfedale, and a striking contrast to the bleak, windswept lands already traversed. The woods and the river together form a combination difficult to equal, while the ancient abbey offers rare opportunities for the photographer. The Strid is, of course, famous. Here the entire waters of the well-known trout river are crushed into a space over which the rash youths attempt to leap. It is a fairly easy jump, but hardly worth it for the sake of the thing, as a false step means certain death by drowning. Just below the rapid under-currents of tremendous strength exist, and the unhappy tourist who makes that false step is probably never seen again till he appears at the end of a grappling iron, many hours later.

Appletreewick is a picturesque little village, favoured much by anglers. The trout fishing in the Wharfe is good, but very strictly reserved. Day tickets for fly-fishing only can be obtained at any of the fishermen's inns for 5s., which after all is not an expensive day as sport and pastime go. At Appletreewick, I believe, the fishing goes with the inn.



A WHARFEDALE TROUT STREAM.

The motor cycle enables one to get to most inaccessible spots in this wild but delightful district.

Where to Go for a Tour.—

Burnsall is perhaps the peach of Upper Wharfedale villages, and is blessed with two very good hotels.

When the writer first knew Burnsall, close upon twenty years ago, it was indeed a village of rest, and surely here there lived a generation of poets? The road running up the hillside, which we descend if we miss Appletreewick and come by the Barden Tower side, was clothed in those days with grass about its centre, so few and far between were passing vehicles.

One of the Sunday evening events of Burnsall is—or used to be, especially about T.T. time—the arrival and departure of the Scott team on their hot-stuff mounts. They sure were some 'buses in the pre-war days, and many other owners of sporting machines usually put in an appearance.

Burnsall village school is rather a picture, set in its own small garden, the condition of which bears testimony to the undying patience which breathes into each fresh generation of juvenile scholars a pride in their seat of learning. The school is associated with the name of Eugene Aram, once a master there, and who finished his morbid career, like Dr. Crippen, "with gyves upon his wrist."

Ancient Pack Roads.

Higher up the valley, Kilnsey, with its overhanging crag, is worthy of note, for we have now gained a country of quite a different nature, the green, well-wooded valley having given way to limestone uplands, rising plateau upon plateau, wind-swept and picturesque. Nevertheless, this land of shallow soil is, in the spring of the year, a miniature Tyrol, and the many streams and ancient pack roads offer fascinating opportunities for exploration. The pack roads are a special feature of this country. Usually they are dead

straight, independent of all gradients, and by them the old-time packmen used to pass from place to place hawking their wares.

Wharfedale is not sparing in what are known as "freak" hills. Journey to Kettlewell and try Park Rash—quite a moderate little pimple which calls for judgment in riding. Or bicycle over the watershed *via* Greenhow and explore the Nidd Valley—one of those closed-in little valleys that have a charm quite of their own, with freak gradients everywhere as soon as the main route is left. A real freak route is from Kettlewell, *via* Park Rash, to Arkleside; then across the Nidd and up Wooddale Scar to Middlesmoor and Ramsgill, where there is another excellent hotel.

Passing out at the headwaters of Wharfedale, one goes by Kidstone Pass and down again at Aysgarth, whence one is *en route* for Sedbergh and the Cumbrian Lakes, through gorgeous moorland country.

To see this land at its best the stereotyped main road tour should be avoided. The by-ways are infinitely the more beautiful and interesting, and usually afford better travelling. Those who care to ramble and put up where the night finds them could not find a happier hunting ground. CHINOOK.

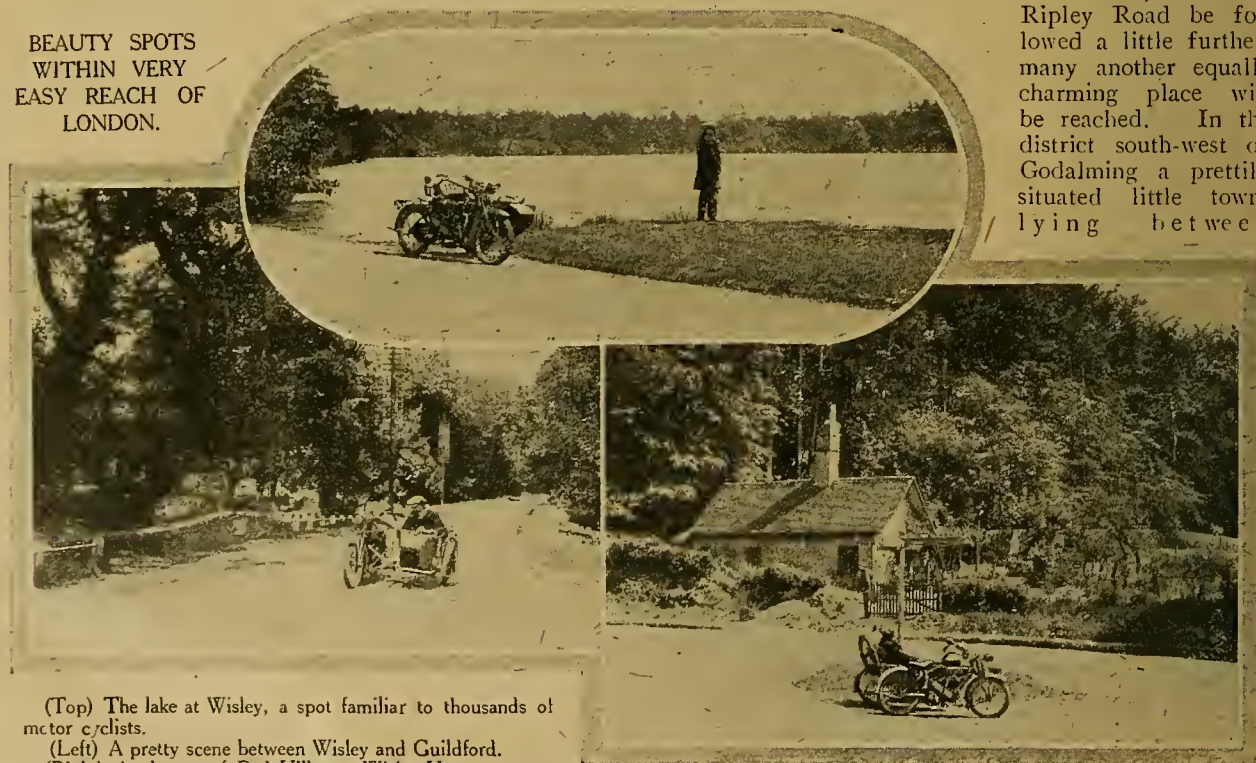
SURREY COMMONS.

IT would be hard to find a pleasanter locality than Surrey for a holiday of the less strenuous kind.

The Commons, which are so common (no pun intended) in that county, are ideal spots in which to while away a few hours of leisure. The Commons are dotted with delightful ponds, many of them artificial, but none the less charming on that account. All London motor cyclists know Wisley Mere and the

Hut Hotel; but if the Ripley Road be followed a little further, many another equally charming place will be reached. In the district south-west of Godalming a prettily situated little town, lying between

BEAUTY SPOTS
WITHIN VERY
EASY REACH OF
LONDON.



(Top) The lake at Wisley, a spot familiar to thousands of motor cyclists.

(Left) A pretty scene between Wisley and Guildford.

(Right) At the top of Red Hill near Wisley Hut.

Where to Go for a Tour.—

hills, and overlooked by Charterhouse School, but with a bad reputation respecting motorists, the Commons extend for mile after mile. The Portsmouth Road can be left at Milford, and a lane leading to Elstead taken. Passing the gates of Peper Harow, the residence of Viscount Middleton, the rider reaches Royal Common, where beeches, birches, bracken, and oaks are plentiful. (Many Surrey commons are covered with firs and heather only.) Here a turn to the right takes him over Somerset Bridge. A turn to the left, and a narrow but pretty lane, and one reaches Cutt Mill, where a series of ponds extends past Hampton Lodge on the edge of Puttenham Common, whence it is a delightful run to Crooksbury. There was some talk a while ago of cutting down the firs on Crooksbury Hill, near Waverley Abbey, but it is to be hoped that they will long be spared.

Frensham, noted for its ponds, lies not far from here, and is well worth a visit. Frensham Great Pond lies close to the road, but the smaller pond—also of considerable size—is not so easily found. At Frensham there is a beautiful old house called Pierrepont House; here, too, it was that hundreds of motor machine gun men recruited by *The Motor Cycle* received part of their training.

After leaving Frensham it is well worth while to visit the Devil's Jumps, a series of rounded hills on

IN THE LOWLANDS OF SCOTLAND.

old man was lying. The sailor's grave is in Thursley churchyard, a few miles away.

From Hindhead there is a descent of about three miles on to Witley Common, another place where ponds abound. The finest of these is known as the Forked Pond, and lies some way from the road over a sandy track. A couple of miles further on Milford is again reached, and the little tour of commons and ponds completed.

AURIGA.

THE LAND OF BURNS—A REGION UNSPOILT BY THE TRIPPER.

THOUGH somewhat remote, from the point of view of most English motorists, the South-west corner of Scotland, frequently known as the land of Burns, is so rich in scenic beauty—from panoramas of pine-capped ridges with mountain torrents gushing between, to the wide, wild, desolate mountain uplands—that it fully repays those who care to venture so far afield.

This region is of note, in that, while being truly Scottish, it is far less inaccessible than the Highlands—indeed, from Carlisle it lies open at our feet, over good hard roads for the most part, except that certain stretches over which lumber has been transported have lost their pristine smoothness of surface.

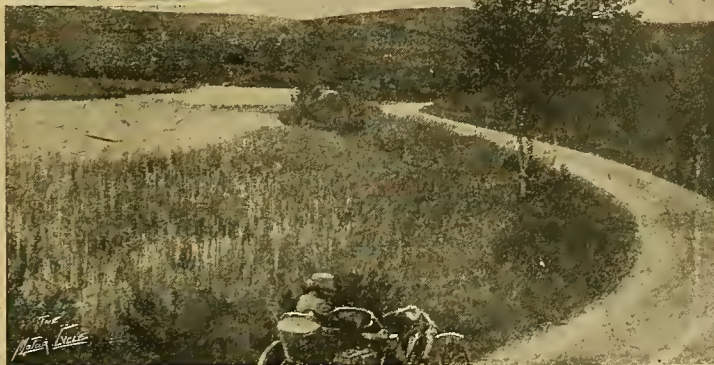
From Carlisle let us head straight for Dumfries, the town of the immortal but ill-starred bard for whom Scotland had no place while he lived, and has bemoaned it ever since. Here flows the River Nith, to which Burns so often alludes—alas, that he was not content to confine all his tastes to its charms!—and his admirers who care to dally for a while will find many scenes to reawaken the poet's charms.

From Dumfries we have a choice of roads. Perhaps the most tempting for the moment lies in the direction of Castle Douglas. The main road can be left at Crocketford, and the road to the right taken. After two or three miles of appallingly bad surface, we now have a gorgeous moorland spin, through country swarming with black game and roe deer, to New Galloway.



(Top) Lochside, a famous angling resort on Loch Ken.

(Bottom) A typical Scottish Lowland landscape. The sidecar outfit in the foreground is a Scott.



the way to Hindhead, and the Devil's Punch Bowl. The stone, which is supposed to mark the place where the famous—or infamous—murder of a sailor took place, stands by the roadside here. When I was a boy I remember an old farm labourer saying that he had a holiday to see the murderer hung on Gibbet Hill above the roadway, but I fancy that the

Where to Go for a Tour.—

Probably the English motorist in this country will be surprised at the immense distances between towns and villages. It is not uncommon, indeed, to travel for miles with no near glimpse of human habitation, but one very soon becomes used to this state of affairs.

But we have pretty villages, scores of them—rows of white-walled cottages nestling beside silver burns, where the hart's tongue and wild garlic shine forth amidst a chaos of discarded fruit trees and retired buckets—cottages on lonely mountain heights, rugged as their surroundings, with rows of shining buckets set out to sweeten, and incidentally to afford perching places for the usual motley throng of hens, most remarkable for the scantiness of their plumage. No wonder it is scanty, for here the very heather hangs low and knotted to battle with the gale. It is a living, devilish, palpable thing, that gale, which blows the very wool off the backs of the mountain sheep, and leaves only the fittest, in man and beast, to survive.

Scottish Natural Beauty.

Galloway town, with its straight main street, is nothing to fall over one's self about in the way of picturesqueness, but it is situated in the midst of wonderful country. Scotland is so rich in natural beauties that her children, past and present, have been mighty canny as regards any addition in the way of architectural charm. If by chance or design an incongruous house or an ugly bridge is erected in Scotland, Nature, using here with a liberal hand her choicest craft, hurries the house in a bower of blossoms, or covers the bridge with a tapestry of ferns.

No one, however, would go to Galloway in order to sit in the main street, and the tiny town is blessed with two good hotels, which is more to the point. It is needless to add that fishing is abundant everywhere in this country; brook and loch, trout fishing can generally be obtained by the simple medium of a little courtesy, while most of the lowland lochs are fairly alive with pike and perch, both excellent eating.

We are now in the towering kells, and the road on to Newton Stewart is a real highland road, passing

through a region still the stronghold of a noble race of mountain birds, many of which long ago gave up the unequal struggle for existence in less secluded parts.

The shepherds of this region live appallingly lonely lives, scarcely seeing a fellow creature save on their occasional and infrequent trips to town. They are quiet-voiced, kindly men possessing a fund of information about their own locality which they are ready to pass on to the visitor, as this land is not yet spoilt by trippers.

From Newton Stewart, we can make for the coast at Girvan, or, if the mountains be preferred to the sea, take the inland road which follows the Minnock Water, passing at the foot of Merrick, which rises to a height of 2,764 feet, thence on to Ayr.

The Home Trail.

Biggar is our next goal, and, whichever road we take, the scenery is charming and wonderfully varied. Reaching Biggar, we are soon in the Tweed Valley heading for Peebles. Of course, the road surfaces are assorted, but the same applies everywhere, and for the most part they are better than the average English road.

Peebles is a rolling upland country of boulder-strewn moorland and pine woods, and the valley is very beautiful; the land of another immortal—no other than Sir Walter Scott. Melrose, with its picturesque abbey and romantic river scenery, should not be missed, and we are now well *en route* to return homewards by the east of England.

I can imagine no more delightful tour than one which, passing northwards by Derbyshire, the Dales, and the Cumberland lakes, takes into its compass this part of Scotland on the lines suggested, finally following the valley of the Tweed back to the eastern boundary.

Such a tour would embrace a great variety of scenery. The Derbyshire hills have a distinction of their own, and the visit to the English Lakes would recompense one for the omission of the Scottish lochs from the tour.

H.M.B.

**LONDON-EDINBURGH RUN**

(Left) F. T. Bidlake checking Lt. G. P. Glen Kidston, R.N. (3½ h.p. Sunbeam), at the finish of the trial
(Right) J. A. Masters (7 h.p. Harley-Davidson) signing the checking sheet at the finish



WHAT a charm the open road has can only be fully realised by those who have tasted its joys.

In this short article I hope to give some hints to readers on the way to make the most of their lives: to enjoy to the full the "open road": the moor, mountain, and stream: to appreciate our beautiful country. It is free to all who would partake of it: free as air and water. Think of it! The cure for a hundred ills is the open air. Here we have a private sanatorium, a holiday home, and a mobile dwelling place, the cost of which is saved in the first holiday, and which can be used for one night or for weeks on end. These are just a few of the many advantages of lightweight motor cycle camping.

The Outfit.

All one needs is a tent. I use a Canadian, with 18in. walls and 9in. eaves. It is 5ft. 9in. high, 6ft. wide, and 7ft. long, and weighs 5 lb. The poles are of bamboo, and take to pieces like a fishing-rod. It is better to use a fly sheet with the tent, which is a sort of double or extra roof, and has the advantages of keeping the tent cooler in summer and warmer in winter, being, in fact, like "Pat's" overcoat. Besides this, one can touch the sides of the tent when it is

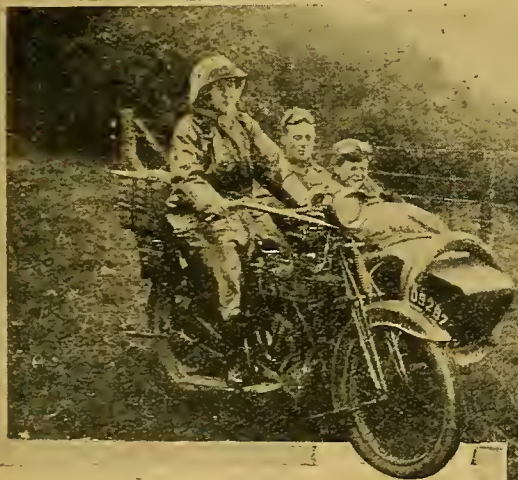
straw bracken, or hay under the ground sheet. Cooking presents no difficulty with a Primus stove, using aluminium saucepans and frypans, which pack away in a small compass. Aluminium spoons and forks save weight; we used bags for sugar, tea, cereals, etc.; while aluminium screw boxes are used for butter and preserves. The Primus needs a windscreen, and it is an easy matter to improvise one usually. The water-bucket and wash-basin are of sail-cloth.

How to Sleep Comfortably.

With this outfit one can cook anything one likes, except bake; but that can be nearly approached by fry-steaming—that is, frying with a tight cover over the pan. I have never yet heard anyone who has visited me complain of the menus, although I often get doubting Thomases before they have tried it.

"But what about sleeping?" you say. This is the delightful part about the open air life. In August, 1918, I spent a fortnight sleeping on a small folding camp bed right out in the open most part of the time. Try it, and you will find town-jaded nerves clear like mist before the sun.

I sleep in the tent with my head towards the open end and my feet in the warm, and, after many experiments, I think I have found the solution of a real comfortable bed in camp. Take two bolster slips made of any light material, as chintz or lawn, and stuff them with dry straw, bracken, or hay. Tie them loosely together top and bottom, spread your blanket or eiderdown on them, and lie *between* them, not on top. Then bring your eiderdown over you, tuck up well, and place your other clothes over the eiderdown, and you will sleep like a top. Do not err on the side of too few clothes. Many novices I have known have spent nearly all their first night tramping the lanes to keep warm.



(Top) The author starting out for a motor cycle camping holiday on her 6 h.p. Enfield.

(Bottom) A camp at Borth-y-Gesh, Portmadoc, North Wales. Many motor cyclists simply use the camp as a sleeping convenience, spending the days motoring in the district.



raining without suffering in consequence. On the floor is spread a proofed sheet, and over this a woollen ground blanket, which keeps the inside cosy and absolutely dry. For long stays it is better to place a little

A Holiday in the Open.—

There is a club which gives useful information, called the Amateur Camping Club, of 4, New Union Street, Moorgate Street, London, E.C.2. The entrance fee is only 1s. and subscription 5s. per year, and you can buy your kit from the club if you do not choose to make it. There are also several District Associations, one of which is at Birmingham. The hon. secretary is Mrs. E. Bosker, 2, Kingsleigh Road, Handsworth.

There are several hundred camp sites which members may use for the small sum of 6d. to 1s. per tent per night, or 2s. 6d. per week; when touring one may

use these sites or procure others, which is quite an easy matter. I have never been refused but once in my fourteen years of lightweight camping, in fact the reverse is nearly always the case.

The most convenient way to carry the kit is to pack it in one large basket containing all that is necessary for a fortnight's tour, a change of clean linen being carried in a small basket in the sidecar away from the dust.

In conclusion, I would urge all interested in open air life to give lightweight camping a trial. I shall be pleased to give any further information to those interested.

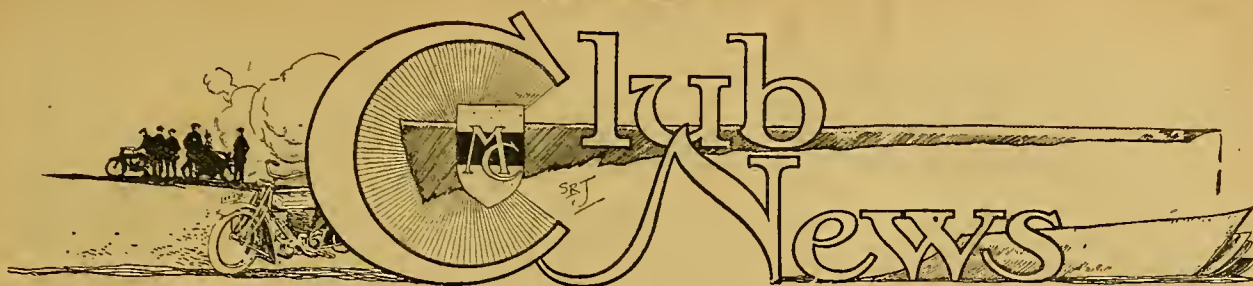
MARY RILEY.



IN THE COOL SHADE OF THE FOREST.

By F. Gordon Crosby.

Unsuspected beauty spots by the wayside are revealed to the explorer of by-ways such as that depicted—the sidecarists passing from the blazing light of the sun to the cool recesses bordering a wayside pool.

**Blackburn M.C.C.**

It has been decided to revive the Blackburn and District M.C.C., and two trophies have been presented for competition.

M.C.U. of Ireland (Ulster Centre).

Fine weather favoured the hill-climb at Red Brae, and there was a good turn-out of spectators, who lined the banks on both sides of the hill from the bottom to the top. Some very good riding was witnessed, and the winner of the first event was J. B. Johnston (Norton) and the winner of the second event J. W. Shaw (Norton). Mr. M'Lardy acted as starter.

Streatham and District M.C.C.

Results of the members' recent speed judging competition:

CLASS A (Sidecars).

1. J. R. W. Pallison (3/4 B.S.A. sc.), error 1m. 20s.
2. S. T. Tessier (8 Bat), error 1m. 40s.

CLASS B (Cycle cars and cars).

1. W. O. Oldman (8 Bayard), error 3m. 10s.

Hon. secretary, Mr. R. M. Hunter, 37, High Street, Clapham, S.W.

The Douglas Club (Nottingham).

A new motor cycle club has been formed in Nottingham. Membership is restricted to A.C.U. affiliated riders of the Douglas. Mr. Martin J. Wright, "Riverside," Trent Embankment, Nottingham, is the hon. sec. (*pro tem.*). He wishes to get together several teams to compete for the East Midland Centre Challenge Trophy, and will be glad to hear from Douglas riders. Mr. Wright is a Douglas enthusiast, having owned well over twenty of these machines.

Midland C. and A.C. (Birmingham).

Forms and competition particulars are ready for the Midland Cycling and Athletic Club one day motor cycle trial on Saturday, June 28th. These can be obtained from the hon. sec., Mr. F. J. Urry, Lucifer House, Lionel Street, Birmingham.

The trials committee have now completed their survey of the course, which runs into something just over 200 miles in length, and takes in a good many new features both in hills and descents, so that competitors who intend to enter should see that their brakes are in perfect order, both for their own safety and for the reason that failure on the brake test means total disqualification.

The trial will pass through some of the most beautiful country in the British Isles.

As a sporting event with some real purpose behind it, the Midland trial should be a success.

Future Events.

- June 19.—N.M.C.F.U., Leeds. Half-yearly General Meeting.
 JUNE 20.—A.C.U. COMMITTEE MEETING AT BRISTOL.
 June 20-21.—Sheffield and Hallamshire M.C.C. Reliability Trial to Holyhead for Hulton Shield.
 JUNE 21.—BRISTOL M.C.C. RALLY AT ASHTON COURT.
 JUNE 21.—JUNIOR CAR CLUB. HILL-CLIMB AT SOUTH HARTING.
 JUNE 21.—MIDDLESBROUGH AND DISTRICT M.C.C. SPEED JUDGING COMPETITION.
 June 21.—Middlesbrough and District M.C.C. Run.
 JUNE 21.—OLDHAM AND DISTRICT M.C. HILL-CLIMB, BOOTH DENE.
 June 21.—Public Schools M.C.C. Surprise Competition.
 June 21.—S. Birmingham M.C.C. Run to Iron-bridge.
 June 21.—Western M.C.C., Glasgow. Run to Largs.
 June 21.—Woolwich, Plumstead, and District M.C. Run to Maidstone.
 June 21.—Yeovil and District M.C.C. Run to Lulworth Cove.
 June 21-22.—Blaenavon M.C.C. Run to Rhayader.
 June 22.—Birmingham M.C.C. Picnic Tour.
 June 22.—Eastern Counties M.C.C. Run to Trumpington.
 June 22.—Essex M.C. Run to Harlow.
 June 22.—Manchester M.C. Inter-club Run with Liverpool M.C.
 June 22.—N.M.C.F.U., Leeds. Run to Garrowby. Slow Hill-climb.
 June 22.—N.M.C.F.U., Portsmouth. Picnic Run to Petworth Park.
 June 22.—Nottingham and District M.C.C. Run.
 June 22.—Rochester, Chatham, and District M.C. Run to Chiddington.
 June 22.—Western M.C.C., Glasgow. Run to Killearn.
 June 22.—Wolverhampton M.C.C. Run to Rudyard Lake, Staffordshire.
 June 22.—Surrey M.C.C. Special General Meeting at 7.30, Angel Hotel, Guildford.
 June 22.—Middlesbrough and District M.C.C. Run.
 June 22.—Rochester, Chatham, and District M.C. Run to Southend.
 June 22.—Blaenavon M.C.C. Run to Fiddler's Elbow.
 JUNE 26.—YEovil AND DISTRICT M.C.C. AND TAUNTON M.C.C. INTER-CLUB HILL-CLIMB.
 JUNE 28.—BIRMINGHAM M.C.C. SPEED TRIALS.
 JUNE 28.—LIVERPOOL M.C. TWENTY-FOUR HOUR TRIAL TO EDINBURGH.
 JUNE 28.—M.C.U. OF IRELAND. ULSTER CENTRE. RELIABILITY RUN.
 JUNE 28.—MIDLAND C. AND A.C. RELIABILITY TRIAL.
 June 28.—Western M.C.C., Glasgow. Old Crock Test.
 June 29.—N.M.C.F.U., Leeds. Run to Malham Tipton.
 June 29.—Rochester, Chatham, and District M.C. Inter-club Meet with Woolwich and Streatham Clubs.
 JULY 1 AND 5.—ARBUTHNOT TROPHY TWO DAYS TRIAL, PLYMOUTH DISTRICT.
 July 5.—M.C.C. Hill-climb.
 July 5.—Birmingham M.C.C. Social Tour.
 July 5.—Streatham and District M.C.C. Members' Reliability Trial.
 July 6.—Nottingham and District M.C.C. Inter-club Run with E. Midland Associated Clubs.
 JULY 6.—OLDHAM AND DISTRICT M.C. RELIABILITY TRIAL.
 JULY 12.—LIVERPOOL M.C. RACES AT COLWYN BAY.
 JULY 12.—WOLVERHAMPTON M.C.C. OPEN TRIAL.
 JULY 14-15.—M.C.U. OF IRELAND. ULSTER CENTRE. IRISH END-TO-END RELIABILITY RUN.
 JULY 19.—BIRMINGHAM M.C.C. MIDLAND CUP TRIAL.
 JULY 25.—ESSEX M.C. SPEED TRIALS AT SOUTHEAST.
 July 27.—Streatham and District M.C.C. Picnic Run to Ashdown Forest.
 AUG. 16.—S.E. COUNTIES INTER-TEAM TRIAL.
 SEPT. 5.—M.C.C. TEAM TRIAL FOR "THE MOTOR CYCLE" CUP.
 SEPT. 15-20.—A.C.U. SIX DAYS RELIABILITY TRIALS.

Manchester M.C.

Results of the Reliability Run to Buxton:

1. F. Mason (3/4 Triumph), 10s. error.
2. H. Ashworth (3/4 Triumph), 65s. error.
3. E. Paxinan (Baby Triumph), 90s. error.

Hon. secretary, Mr. F. A. Eltoft, 133, Oswald Road, Chorlton-cum-Hardy.

Surrey M.C.C.

A special general meeting of the club will be held at the Angel Hotel, Guildford, at 7.30 p.m. on Tuesday, June 24th, at which it is hoped all members will be present. An amalgamation with the Farnham and District M.C.C. will be considered.

An Eastbourne Club.

At a meeting held at the Gildridge Hotel, Eastbourne, it was decided to form the Eastbourne and District M.C.C. There are many keen motor cyclists in the neighbourhood and a successful first season is anticipated. The club, which will be affiliated to the A.C.U., is also open to owners of light cars and cycle cars.

Essex M.C.

The Southend speed trials have been postponed until July 23rd, owing to the illness of Mr. A. G. Reynolds, the timekeeper. The programme is now arranged, and may be obtained from the organising secretary, Mr. Harold Fuller, 51, Pulteney Road, South Woodford.

West Kent M.C.

The old Blackheath and District M.C. has been reformed with the title of West Kent M.C., and a prosperous period appears to be ahead. The hon. secretary is Mr. J. S. Wilson, Burnham Lodge, Lake Avenue, Bromley, Kent, who will be pleased to hear of motor cyclists in the district who wish to join the club.

Irish Twenty Hour Trial.

Out of fifteen starters in the strenuous twenty-hour trial organised by the Cork M.C.C., only six finished. The course was 344½ miles, and took in the following towns: Cork, Fermoy, Dungarvan, Carrick-on-Suir, Clonmel, Mitchelstown, Cork, Killarney, Waterville, Kenmare, Macroom, Cork. The route formed the figure eight with Cork as the central point. The following competitors started. Only those marked with an asterisk finished:

- *R. S. Russell (2½ Sunbeam)
- W. Lane (2½ Douglas)
- J. Gibbins (4¼ B.S.A. sc.)
- *Jas. Browne (2½ Douglas)
- A. Healy (2¼ O.K. Junior)
- W. P. Musgrave (4 Triumph sc.)
- *E. B. Russell (4 Triumph)
- Flurry (2¼ Lewis)
- *J. P. Frost (2½ Douglas)
- D. Duggan (2½ Douglas)
- T. R. Popham (6 Enfield sc.)
- *H. C. Johnson (2¼ Revere)
- *R. Pericho (3½ Scott)
- J. Cuddigan (3½ Indian)
- F. Merrick (3½ Humber)

CURRENT CHAT

Times to Light Lamps.

SUMMER TIME.

June 19th	...	...	9.48 p.m.
" 21st	...	...	9.48 "
" 23rd	...	...	9.49 "
" 25th	...	...	9.49 "

Revised Prices.

Prices are constantly fluctuating owing to the unsettled state of labour and the material market. The popular Levis is now £44 13s. The Allon has gone up £5.

A Pillion Load.

A press photographer on the London-Edinburgh run astride a 4 h.p. Triumph, carried his wife, two cameras, and a tent in which they camped out at Grantham. They completed the run.

High Prices.

One of the chief causes of the recent increases in prices of motor cycles is the decision of the Government to continue the national awards which were granted as a war measure and which, it was understood, would be removed after the war. These awards, as is well known, amount approximately to 25s. per week per man, and every manufactured article or piece of material which enters the motor cycle factories has to carry these national awards in every factory through which it passes. Any of our readers who may be in receipt of the national award must not grumble about the prevailing high prices.

Silence of 1919 Twins.

As an example of the silence of the modern twin, two competitors in the London-Edinburgh run, riding the new Clyno and A.J.S. sidecar, carried on an easy conversation while maintaining an average speed of 20 m.p.h.

Safety First.

The Automobile Association has adopted the motto "Safety First" for all future A.A. and M.U. road signs and warnings. The first signs to be brought up-to-date in this connection are the "School" and "Concealed Turning" warning notices, which bear the motto.

Police Traps.

We are informed that there is a police trap working on the main road between Hounslow and Staines, at the cross roads at Bedfont, just by the Minimax factory.

The trap mentioned in our issue of the 5th inst. as working on Sudbury Hill, Harrow, is now working on the Pinner Road, on the opposite side of the hill.

Lighter Motor Vehicles.

The *Autocar* is carrying on the campaign instituted by *The Light Car* (a sister journal now incorporated in the former paper) in favour of lighter cars. In fact, *The Autocar* makes a strong plea for an improved power-weight ratio all round, in which connection it is quite possible for motor cycle designers to effect an improvement both in solo and sidecar machines.

Special Features.

WHERE TO GO FOR A TOUR.

A REVIEW OF DESIGN.

NO AGE LIMIT.

Paris-Nice Next Year.

The Paris-Nice trial, an event which proved a success in 1913 and 1914, will be revived in 1920; date, February 15th to 30th. No doubt there will be a number of British competitors as hitherto.

Direct Representation Overseas.

Capt. Woodward, who recently contributed an article on motor cycle conditions and requirements in South Africa, has been appointed direct factory representative in British South Africa for Messrs Humphries and Dawes. Direct factory representatives abroad are very few where the British motor cycle industry is concerned, and this example set by the makers of the O.K. motor cycle is one which might well be followed by other manufacturers.

Old and New Government Motor Cycles.

The prices paid for the 4 h.p. Triumph and 2½ h.p. Douglas motor cycles sold at the Agricultural Hall, Islington, on Tuesday, June 10th, show that the high prices hitherto reached with comparative ease are now on the decline, and the tendency to buy a machine at any price was less noticeable. Keen competition was the rule, but the buyers had, apparently, fixed their maximum price and would not exceed it.

The best Triumph, from external inspection, had no carburettor or magneto, the clutch and saddle were also deficient, but this machine was sold for 38 gns.

The price for this "star" Triumph was run very closely by another of these motor cycles, in much worse condition, which realised 33 gns.

The remaining machines, in various stages of decay, were sold at prices ranging from 30 gns. to 16 gns.

Following the Triumphs came twenty new 2½ h.p. Douglas motor cycles. The price obtained for one of these machines at the last sale exceeded 80 gns., yet the highest price reached this time was 71½ gns. This figure was approached by two machines at 71 gns. and five at 70 gns. The remaining Douglases fetched an average price of 67 gns.

The sale, conducted by Messrs. Goddard and Smith, was well attended, and many ladies were present, possibly with a view to purchasing one of the Singer light cars included in the catalogue.



Members of the newly formed Royal Aircraft Establishment M.C.C., Farnborough, about to start on their recent opening run. This club has every prospect of a large membership and a successful future.

Motor Bicycles at a Profit.

It was announced at the Agricultural Hall, Islington, that a large number of motor cycles sold by the Disposal Board of the Ministry of Munitions were resold by the buyer in less than twenty-four hours at a profit of ten guineas each.

"Surplus."

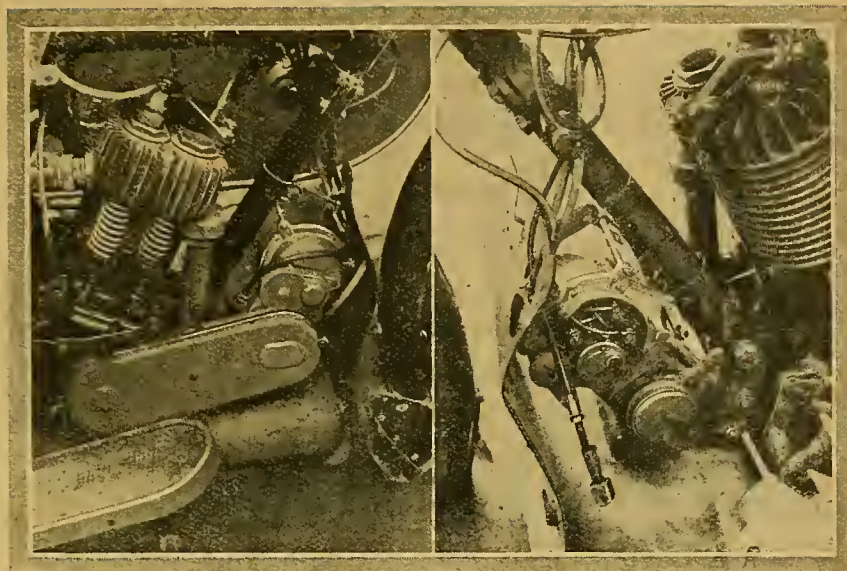
We are in receipt of a publication issued by the Government, entitled *Surplus*, price 3d., the official organ of the Government Property Disposal Board; secretary, Major F. C. T. Tudsbury, O.B.E., L.L.M., Armament Buildings, London, S.W.1. In this book is contained full information concerning the disposal of surplus Government property of all kinds, tools, mechanical transport (including motor cycles), metals, etc. Provincial sales are to be held at dates to be announced hereafter at Manchester, Halifax, Edinburgh, Glasgow, Dublin, Birmingham, Colchester, Newcastle, Liverpool, Sheffield, Cardiff, and Leeds.

Atlantic Flight.

The Atlantic flight in 16h. 27m. is another victory for the internal combustion engine, which the motor cycle and motor cyclists have helped to develop to its present stage of perfection. The success was all-British—men, design, machine, and engines. These last were Rolls-Royce Eagle, two in number, and the flight is a tribute to the quality of the workmanship of the Vickers firm who produced the "Vimy" aeroplane, the makers of the engine, and of carburettors and magnetos.

The Lucas Magdyno.

The new Lucas Magdyno combined ignition and lighting unit made its debut on several machines in the London-Edinburgh run. The Magdyno which has been undergoing road tests



The new Lucas Magdyno ignition and lighting unit on an A.J.S. machine.

during the past two years, is the first British made apparatus of this kind, and probably will be "standard" on a large number of 1920 models which have been designed specially to accommodate it. It may be recalled that we also illustrated this unit when describing the new 8 h.p. Clyno in our issue for February 20th, this year. A Magdyno fitted to a competing machine, ridden by a member of *The Motor Cycle* staff, gives splendid results. Although the head-lamp was screened by tissue paper, the light was extraordinarily powerful though well diffused, and, consequently, without glare.

Specials' Farewell Dinner.

The A.A. Section, Headquarters Central Detachment, Special Constabulary, held a farewell dinner at Messrs. Gatti's, on Thursday last, Sir Nevil Macready, the Chief Commissioner of the Metropolitan Police, presided, and commented upon the splendid work of the A.A. motor section and of all the members of the Special Constabulary, who had so splendidly responded to the call in order to release other men for the Forces.

A Government Sale of Motor Cycles.

One hundred unused 2½ h.p. Douglas motor cycles were offered for sale by Messrs. Goddard and Smith at Islington, on Friday last, the 13th.

The price obtained for these models kept within strict limits, and did not exceed 73 gns. A few were knocked down for 59½ gns., but the majority fetched an average price of 66 gns.

Imports and Exports.

Import values of motor cycles and parts for May show a big increase over last month, the figures being £4,675 and £1,535 respectively.

EXPORTS.

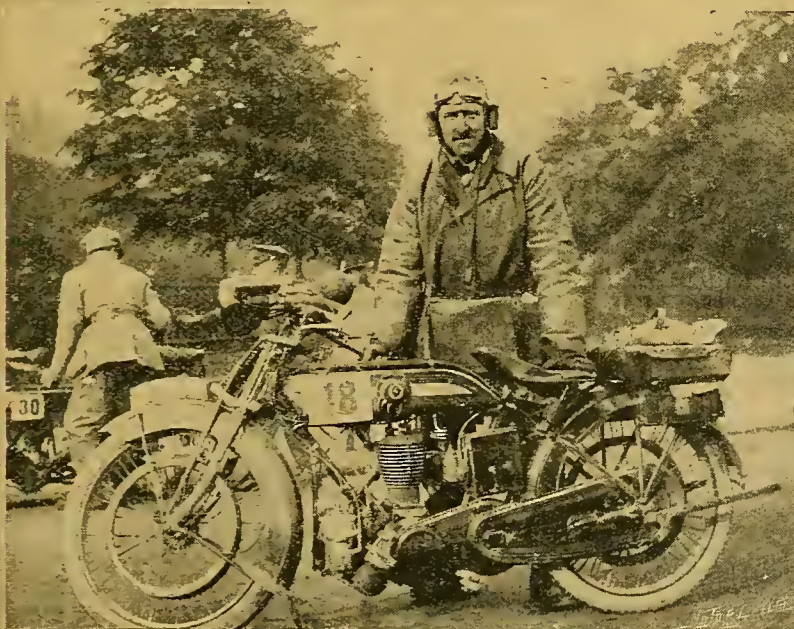
A return to approximately the March figures was obtained, after the drop in April, by the exports value for May, which totalled £130,288, as against £62,076 in the previous month. The values for May of the three consecutive years are here given:

May, 1917.	May, 1918.	May, 1919.
£60,850	£48,861	£130,288

It is also of interest to note the proportions of the parts values to these totals for the three years—£19,298, £29,162, and £69,934.

PETROL IMPORTS.

Petrol importation in May amounted to 22,007,345 gallons, as against 21,564,131 gallons for the corresponding month last year. This quantity, however, is a big increase on the previous month's (April) figures, which showed that 16,090,485 gallons were brought into the country.



H. R. Lane, a competitor in the London-Edinburgh run, with his 4½ h.p. B.S.A., fitted with the new Lucas Magdyno.

A SCOTTISH OPEN HILL-CLIMB.

The Glasgow Western M.C.C. Event.

AN excellent entry was received for the open hill-climb organised by the Western M.C.C.—the new Glasgow Club. Forty-three riders altogether entered the following five classes:

Class 1.—Motor cycles having cylinder capacity not exceeding 350 c.c.

Class 2.—Motor cycles having cylinder capacity exceeding 350 c.c. and not exceeding 600 c.c.

Class 3.—Motor cycles having cylinder capacity exceeding 600 c.c.

Class 4.—Motor cycles and sidecars not exceeding 600 c.c.

Class 5.—Motor cycles and sidecars exceeding 600 c.c.

The winners in each class were decided on the formula: $\frac{\text{Weight}}{\text{capacity} \times \text{time}}$.

Competitors assembled at Canniesburn Toll, near Glasgow, at 2.30 p.m., where they were weighed. After these preliminaries, riders and spectators made for the venue, Garshake Hill, near Dumbarton, where they found the surface of the hill in splendid condition for fast times.

The first class was started at 3.45 p.m., Hancock (2½ A.J.S.), being the first man off. After rather a poor start, he picked up well and finished in good style. D. S. Alexander (2½ Douglas) made a good start, and, travelling at a high speed up the fairly steep slope, was timed at 48 sec., which was the fastest time in the class. D. R. Parsons (2½ N.U.T.) made a good climb, and, although not as fast as Alexander, was the winner on formula.

Class 2, for 3½ h.p. machines, produced some good climbs, J. Spence (3½ Rover) making fastest time, 48½ sec. Capt. Walker (3½ Triumph) ran him pretty close with 49½ sec., while W. Deans (3½ Ariel) followed with 50½ sec. Singularly enough, none of the 3½ machines equalled the time put up by Alexander (2½ Douglas).



Capt. Dickson (8 h.p. Zenith) on one of the hills included in the Western Glasgow M.C.C. open hill-climb on Saturday. Capt. Dickson rode from Montrose (over 100 miles) for the event.

The most thrilling riding was naturally seen in the big class. A. J. Carlow (8 Zenith) made a very spectacular ascent, taking the bend near the top close in; his time of 36½s. being fastest time of the day. A. Brash (7 Harley-Davidson) did not repeat his performance in the Glasgow M.C.C. climb, and lost a little time in cutting out to round the bend. His time was 37½s.

A surprisingly fast climb was that of R. McCulloch (6 A.J.S.). He ascended the hill at a great speed, his time being 39½s., which gave him an easy win on formula. A. J. Carlow (5 Indian) put up another good performance, obtaining second place on formula. Geo. Keely (5-6 James) also made a good climb.

D. S. Alexander (8 Enfield) had plug trouble, and practically accomplished the climb on one cylinder.

In Class 4 for 600 c.c. sidecars J. Spence (4 A.J.S. sc.) started off well, but when a few yards from the finishing line his gear control jumped out, nevertheless he made fastest time in his class, this being 71½s. Hancock (2½ A.J.S. sc.) obtained first place on formula, and made an excellent climb considering the small size of his engine. H. M. Fraser (3½ Sunbeam sc.) was second on formula.

In the large sidecar class, A. Brash (7 Harley-Davidson) made fastest time, only a matter of 10s. slower than his solo climb. The winner on formula was Geo. Kelly (5-6 James sc.), who did much better than in his solo effort.

D. S. Alexander (8 Enfield sc.) broke a chain at the start, while R. McCulloch (6 A.J.S. sc.) started off well, but, when half way up, his gear slipped into neutral.

For a first effort of the club, the climb was particularly successful, and the officials deserve every credit for the manner in which the arrangements were carried out. It seems to us, however, a pity that an obsolete formula should have been used, giving an undue advantage to weight and small capacity. It will be noted that in no case has the fastest competitor won on formula.

The results on formula are as follows:

CLASS I.

1. B. R. Parsons (2½ N.U.T.).
2. Hancock (2½ A.J.S.).

Fastest time: D. S. Alexander (2½ Douglas), 48s.

CLASS II.

1. W. Deans (3½ Ariel).
2. H. Gold (3½ Wolf).

Fastest time: J. Spence (3½ Rover), 48½s.

CLASS III.

1. R. McCulloch (6 A.J.S.).
2. A. J. Carlow (5 Indian).

Fastest time: A. J. Carlow (8 Zenith), 36½s.

CLASS IV.

1. Hancock (2½ A.J.S. sc.).
2. H. M. Fraser (3½ Sunbeam sc.).

Fastest time: J. Spence (4 A.J.S. sc.), 71½s.

CLASS V.

1. Geo. Kelly (5-6 James sc.).
2. J. Barclay (6 A.J.S. sc.).

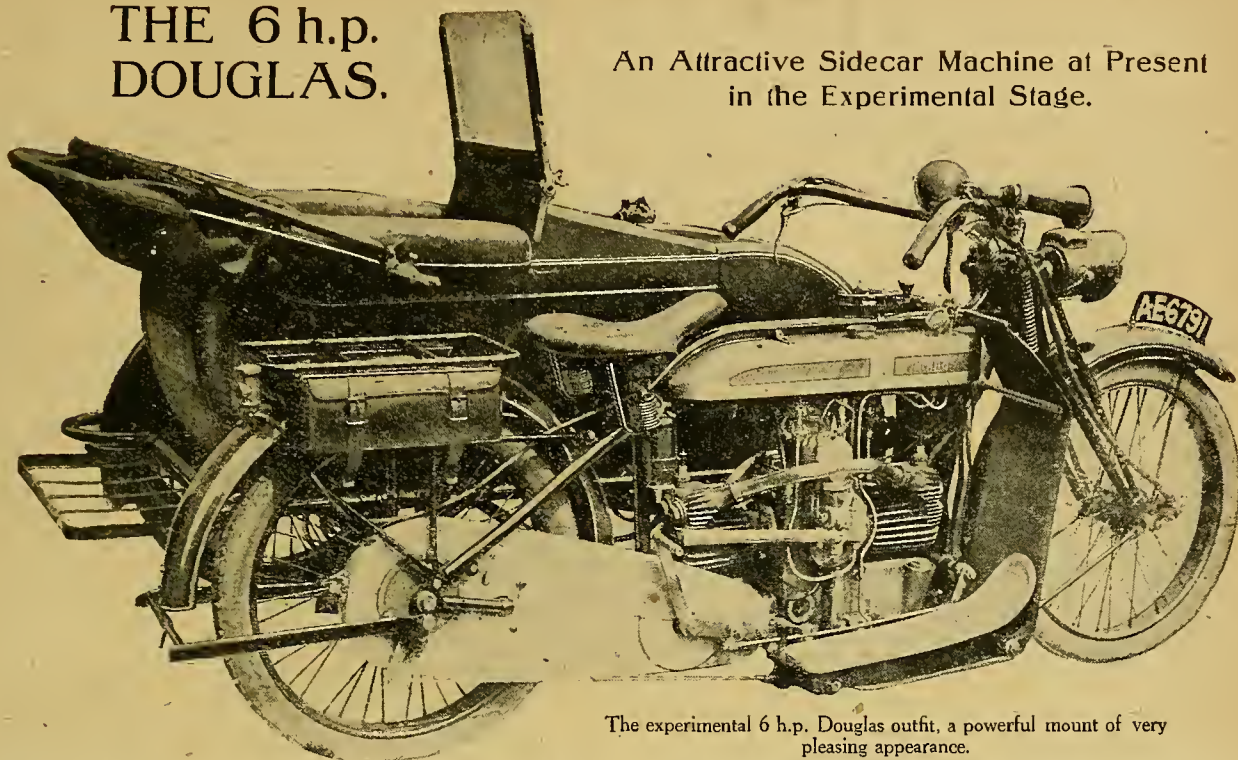
Fastest time: A. Brash (7 Harley-Davidson sc.), 47½s.



The start of the Edinburgh M.C. one hundred mile sporting trial, held last Saturday. Reading from the left: Carfrae (3 h.p. Enfield), — Driver (2½ h.p. Douglas), and N. R. Fenwick (5 h.p. Rover).

THE 6 h.p. DOUGLAS.

An Attractive Sidecar Machine at Present
in the Experimental Stage.



The experimental 6 h.p. Douglas outfit, a powerful mount of very pleasing appearance.

FOR nearly two years Messrs. Douglas Motors, Ltd., have had a 6 h.p. model on the road, and, while nothing has yet been decided as to whether it will be marketed this year, a photograph of the machine cannot fail to interest.

Perhaps the first point which will attract notice is the all-chain all-enclosed transmission, the final drive being on the "off" side of the machine, which, incidentally, is very compact considering that a comparatively large flat twin

had to be accommodated. A three-speed gear with new type multiple plate clutch is fitted, which is interconnected with the gear change control, making the changing of gears, without declutching, impossible. Interchangeable wheels are also a feature. We tried this machine over a year ago, and were particularly struck with its exceptionally smooth running and ample reserve of power. Undoubtedly a Douglas sidecar machine of this power would be very popular and prove as efficient as the smaller models.

A "Benzole" Trial Among Welsh Hills.

Only Ten Competitors in the Liverpool M.C. Open Reliability Trial out of Thirty-four Starters secured First-class Awards.

THE first trial to be run on benzole turned out to be a strenuous test for even modern machines, and of the thirty-four starters only ten qualified for first-class awards. The course was 134 miles, and included Cilcain Hill and Bwlch-y-Groes, which proved formidable for machines running on benzole where carburetters had not been retuned. This and the strong following wind caused many machines to overheat.

The following are the official results, with notes:

1. L. V. Barton (8 Rex sidecar). Retired Cilcain, back wheel slip.
2. Mrs. Baxter (6 Clyno sidecar). Non-starter.
3. Harry Marston (6 A.J.S. sidecar). First-class award.
4. F. Smith (8 Clyno sidecar). Third class award. Failed Bwlch-y-Groes and Old Horseshoe Pass.
5. J. C. Walker (2½ Alldays solo). Non-starter.
6. J. W. Wills (4 Triumph sidecar). Third class award. 13 mins. out Bala.
7. J. A. Newmao (3½ Sunbeam solo). First class award.
8. H. T. Williams (6 A.J.S. sidecar). Failed on time at finish.
9. J. H. Fox (4½ B.S.A. solo). Second class award. Failed Bwlch-y-Groes.
10. C. R. West (6 A.J.S. sidecar). Retired Bala, clutch burnt out.
11. E. Jones (3½ Norton solo). Retired, sprained wrist.
12. O. Wade (6 A.J.S. sidecar). Third class award. 5 mins. late Bala.
13. H. M. Bell (3½ Rudge solo). Failed Cilcain. Retired Dinas Mawddwy.
14. S. Parker (5 Brough solo). First class award.
15. S. B. Reece (4 Triumph solo). First class award.
16. R. H. W. Brown (6 A.J.S. sidecar). Third class award. 15 mins. out Bala.
17. S. W. Phillpott (2½ Coulson-B. solo). Non-starter.
18. J. Dudley (3½ Sunbeam sidecar). Third class award. 6 mins. out Bala, return.
19. A. G. Cocks (2½ Clyno solo). Third class award. Failed Bwlch-y-Groes and Old Horseshoe Pass.
20. J. D. McLean (7-9 Harley-Davidson sidecar). Non-starter.
21. E. R. Wintle (5-6 James solo). Third class award. Failed Cilcain water splash; stop Dinas Mawddwy.
22. G. L. Fletcher (4 Douglas sidecar). Failed Bwlch-y-Groes. Finished late.
23. H. S. Jones (3½ Scott solo). Failed Bwlch-y-Groes. Finished late.
24. A. G. D. Cleese (4 Norton sidecar). Non-starter.
25. G. Dance (3½ Sunbeam solo). First class award.
26. E. L. Boston (3½ Sunbeam solo). Retired Bwlch-y-Groes.
27. G. S. Boston (2½ A.J.S. solo). Third class award. Failed Cilcain water splash; stop Bwlch-y-Groes.
28. H. Logan (3½ Zenith sidecar). Failed Cilcain, and retired.
29. H. Newey (2½ Levis solo). First class award.
30. R. G. Mundy (8 Matchless sidecar). First class award.
31. N. Brown (5 Indian solo). First class award.
32. V. E. Horsmao (4 Norton sidecar). First class award.
33. R. E. Pugh (2½ Levis solo). First class award.
34. J. Collins (6 A.J.S. sidecar). Disqualified (carried no passenger).
35. J. Swinton (7-9 Indian solo). Broke clutch Cilcain, and retired.
36. H. A. Brayshaw (6 N.U.T. sidecar). Non-starter.
37. R. C. Charlesworth (5 Zenith solo). Non-starter.
38. A. Dray (3½ P. & M. sidecar). Non-starter.
39. L. M. Southwell (4 Norton solo). Second class award. 30 secs. late Bala, return.
40. H. D. Ashworth (4 Triumph sidecar). Non-starter.
41. V. W. Goss (4½ B.S.A. solo). Third class award. Failed Bwlch-y-Groes 5 mins. late Bala.
42. F. Morris (3½ Edmund sidecar). Non-starter.
43. A. Wood (4½ B.S.A. solo). Third class award. Stop Cilcain. Foot sluggish and stop, Bwlch-y-Groes.
44. C. B. G. Gill (4 Triumph sidecar). Non-starter.
45. L. L. Sealey (4½ B.S.A. solo). Second class award. Stop. Bwlch-y-Groes.

TEAMS.

- 8, 10, and 16 A.J.S. Did not qualify.
41, 43, and 45, B.S.A. Best team performance, but did not qualify.
11, 32, and 39, Norton. Did not qualify.

LONDON-EDINBURGH OFFICIAL RESULTS.

Including Cars: 130 Gold Medals; 4 Silver Medals; 1 Bronze Medal. Two Awards held over. 17 Retire.

Excluding Four-wheeled Vehicles: 115 Gold Medals; 4 Silver Medals; 1 Bronze Medal. One Award held over. 14 Retire.

A.B.C.
E. M. P. Boileau (3 solo). Gold medal.
J. Emerson (3 sc.). Gold medal.

A.L.L.O.N.
H. Phillips (2½ solo). Gold medal.
A. McClue (2½ solo). Gold medal.
L. E. Clulec (2½ solo). Gold medal.

A.J.S.
W. S. Jameson (6 solo). Gold medal.
*J. Stevens (6 sc.). Disqualified.
E. Milton (6 sc.). Gold medal.
S. Julian (6 sc.). Gold medal.
R. Hay-Will (6 sc.). Gold medal.
J. D. Campbell (6 sc.). Gold medal.
Geo Stevens (6 sc.). Gold medal.

ARIEL.
L. Pulham (3½ solo). Gold medal.
J. L. Stocks (3½ sc.). Gold medal.
E. Atkins (3½ sc.). Gold medal.
F. E. Jones (3½ sc.). Gold medal.

B.S.A.
M. Luiggi (4½ solo). Award in abeyance.
H. R. Lane (4½ solo). Gold medal.
J. E. Addingley (4½ solo). Gold medal.
P. D. Walker (4½ solo). Gold medal.

B.A.T.
J. Godsall (8 sc.). Gold medal.

BLACKBURN.
J. A. Watson-Bourne (4 solo). Gold medal.
P. J. Enticknapp (4 solo). Gold medal.
S. F. Garrett (8 sc.). Gold medal.
J. S. Holroyd (8 sc.). Gold medal.

BROUGH.
G. W. Wilkin (6 sc.). Gold medal.

CHATER-LEA.
G. F. Udall (2½ solo). Gold medal.
R. C. Davis (8 sc.). Gold medal.

CLYNO.
A. G. Cocks (2½ solo). Gold medal.
H. Gibson (4 sc.). Gold medal.
G. Nott (5-6 sc.). Gold medal.

DOUGLAS.
W. Cooper (2½ solo). Gold medal.
L. A. Baddeley (2½ solo). Gold medal.
V. Olsson (4 solo). Gold medal.
P. W. Moffat (3½ solo). Gold medal.
Tudor Thompson (2½ solo). Gold medal.
R. T. Leather (2½ solo). Silver medal.
W. J. Fleetwood (2½ solo). Gold medal.
A. N. Kingwill (2½ solo). Gold medal.
F. G. Ball (2½ solo). Gold medal.

SUMMARY OF RESULTS.							
	Started.	Gold.	Silver.	Bronze.	Held Over.	Dis-qualified.	Re-tired.
2-STR. LIGHTWEIGHTS	13	12	-	-	-	-	1
4-STR. SOLOS	30	25	-	-	1	-	4
SINGLE-CYL. SIDE CARS	18	13	-	1	-	1*	3
TWIN SOLOS	25	19	2	-	-	2*	2
1-CYLINDER SOLOS	1	1	-	-	-	-	-
TWIN SIDECARS	48	41	1	-	-	2*	4
RUNABOUTS	5	4	1	-	-	-	-
CARS, ETC.	19	15	-	-	1	-	3
	159	130	4	1	2	5	17

* Too early at Catterick or Doncaster.

DOUGLAS (Cont.)
G. Fletcher (4 sc.). Gold medal.
W. B. Gibb (3½ sc.). Gold medal.
E. G. Johnson (4 sc.). Gold medal.
Thompson Thompson (4 sc.). Gold medal.
† V. Deacock (4 sc.). Disqualified.
C. Pearson (4 sc.). Gold medal.
J. Haslam (4 sc.). Gold medal.
F. Thorpe (4 sc.). Gold medal.

DIAMOND.
H. B. Bateman (2½ solo). Gold medal.

ENFIELD.
T. H. L. Witt (6 sc.). Gold medal.
P. B. G. Vale (8 sc.). Gold medal.
J. Smith (6 sc.). Gold medal.
E. Marshall (6 sc.). Gold medal.

HARLEY-DAVIDSON.
G. Grinton (7 sc.). Gold medal.
R. C. Osborne (7 sc.). Silver medal.
J. A. Masters (7 sc.). Gold medal.
W. A. Fell Smith (7 sc.). Gold medal.
L. de Aranjio (7 solo). Gold medal.

HENDERSON.
J. Robertson Brown (8-10 solo). Gold medal.

HOBART.
A. E. Walker (2½ solo). Gold medal.

HUMBER.
E. C. R. Johnson (3½ solo). Gold medal.
J. E. Sharpe (3½ solo). Gold medal.
C. W. Addingley (3½ solo). Gold medal.
J. Mackenzie (6 sc.). Gold medal.

* Too early at Catterick.

INDIAN.
E. A. Bridgman (7 sc.). Gold medal.
F. A. Applebee (7 sc.). Gold medal.

JAMES.
*A. M. C. Scott (5-6 solo). Disqualified.
H. Reyre (4½ solo). Gold medal.
H. H. Saddington (5-6 sc.). Gold medal.
E. J. Pittock (5-6 sc.). Gold medal.

LEA-FRANCIS.
A. J. Sproston (3½ solo). Gold medal.
*J. A. W. Armstrong (3½ solo). Disqualified.

LEVIS.
P. Pike (2½ solo). Gold medal.
H. Walker (2½ solo). Gold medal.

MABON.
A. Mabon (4 sc.). Gold medal.

MATCHLESS.
H. R. Harveyson (6 solo). Gold medal.
R. Mundy (8 sc.). Gold medal.
F. J. Ellis (8 sc.). Gold medal.
J. A. Hoult (8 sc.). Gold medal.

MORGAN.
H. F. S. Morgan (8). Gold medal.
V. McGarigle (8). Silver medal.
G. Pettit (8). Gold medal.
E. Williams (8). Gold medal.
H. G. Bell (8). Gold medal.

METRO-TYLER.
W. C. Hemy (2½ solo). Gold medal.
G. F. Ammon (2½ sol). Gold medal.

MOTOSACOCHE.
H. Le Vack (8 sc.). Gold medal.

† Too early at Doncaster.

NORTON.
S. Sawyer (4 sc.). Gold medal.
D. R. O'Donovan (4 sc.). Gold medal.
D. Bradbury (4 sc.). Gold medal.

OMEGA.
W. J. Lake (2½ solo). Gold medal.

P. & M.
D. S. Baddeley (3½ solo). Gold medal.
T. Bullis (3½ solo). Gold medal.

ROVER.
S. Hall (3½ solo). Gold medal.
J. Hilger (3½ sc.). Gold medal.
E. B. Lathbury (3½ sc.). Bronze medal.

REX.
W. P. Tippet (4 sc.). Gold medal.

RUDGE.
F. E. Salter (3½ solo). Gold medal.

SIRRAH-VERUS.
T. H. Weaver (2½ solo). Gold medal.

SUNBEAM.
W. R. Preston (3½ solo). Gold medal.
G. P. Glen Kidston (3½ solo). Gold medal.
P. T. C. Body (3½ solo). Gold medal.
L. Nicholson (3½ solo). Gold medal.
T. Rutherford (3½ solo). Gold medal.
T. C. De La Hay (3½ sc.). Gold medal.
A. J. Read (8 sc.). Gold medal.
H. Minton (3½ sc.). Gold medal.
F. C. Townshend (3½ sc.). Gold medal.

TRIUMPH.
R. L. Williamson (4 solo). Gold medal.
F. Notari (4 solo). Gold medal.
N. Rycroft (4 solo). Gold medal.
P. C. Boxer (4 solo). Gold medal.
T. J. Ross (4 solo). Gold medal.
P. W. White (4 solo). Gold medal.
G. Wray (3½ solo). Gold medal.

WOOLER.
K. V. Chidley (2½ solo). Gold medal.
J. F. Hull (2½ solo). Gold medal.

ZENITH.
C. H. Hunt (3½ solo). Gold medal.
R. C. Charlesworth (5 solo). Gold medal.
Kaye Don (8 sc.). Gold medal.
† A. G. Fenn (3½ sc.). Disqualified.
F. H. Richards (5 sc.). Gold medal.
F. H. Ronsley (8 sc.). Silver medal.
A. H. N. H. Hewitt (6 solo). Gold medal.
B. Alan Hill (3½ solo). Gold medal.
K. de B. Smart (8 sc.). Gold medal.

Whitsuntide Trials in Ireland.

Dublin and District Club.

BUT a small field took part in the second post-war reliability trial of the Dublin and District Motor Cycle Club on Whit-Monday. The course, of approximately 140 miles, was a fairly severe one, taking in some well-known test-hills in Co. Wicklow. Of the twenty-nine entrants, only fourteen presented themselves at the start. This was due chiefly to the uncertainty of catering arrangements and the non-delivery of new machines.

There were very few motor cycles of this year's make, and most of the riders were novices. The latter fact, coupled with the intricate nature of the course, resulted in only eight of the competitors completing the journey, and only one of these, R. Armstrong (5-6 h.p. Enfield sc.), secured full marks. Armstrong will probably be awarded the Dunlop Cup, but the result is subject to confirmation by the committee. The finishers were as follows:

D. Allen (3½ Norton)
R. Armstrong (5-6 Enfield sc.)
J. Redmond (7-9 Indian sc.)
R. Hewison (7-9 Indian sc.)

W. Redmond (5-6 Indian)
T. Redmond (7-9 Indian)
J. Smith (7-9 Indian)
C. Johnston (2½ Crescent)

The Cork "Twenty."

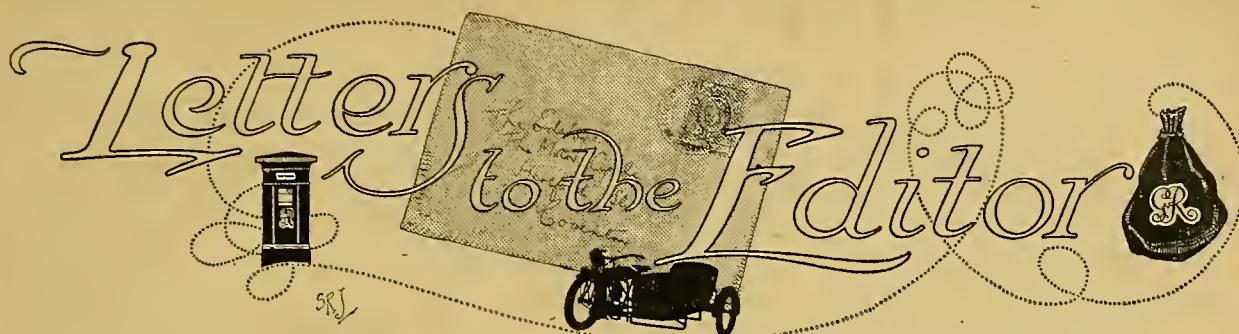
The open twenty hours' trial of the Cork Club on Whit-Monday did not attract many riders. As in the Dublin trial on the same day, the number of new machines was conspicuously small, only four of the fifteen competitors having 1919 mounts.

The trial started from Cross's Garage, South Wall, at 1.30 a.m. on Monday, passing through Fermoy, Dungarvan, Carrick-on-Suir, Clonmel, and Mitchelstown. Despite the relatively easy nature of the course, the field was reduced by half on reaching Cork. The second portion of the course was more difficult, but, contrary to expectation, six of the seven men completed the 345 miles. Gowlane and Ballaghosheen proved the test pieces of the route. The two Russells and Browne climbed both of the hills successfully, and, as all three were on time at all the open controls, they are likely to secure the chief awards of the trial. Those who finished were:

R. S. Russell (2½ Sunbeam)
J. Browne (2½ Douglas)
E. B. Russell (4 Triumph)

J. P. Frost (2½ Douglas)
H. C. Johnson (2½ Revere)
R. Perico (3½ Scott)

Letters to the Editor



The Editor does not hold himself responsible for the opinions of his correspondents.
All letters should be addressed to the Editor, "The Motor Cycle," Herford Street, Coventry, and must be accompanied by the writer's name and address.

BENZOLE AND TANKS.

Sir,—I notice in *The Motor Cycle* of May 22nd a letter from one, "Excelsior," concerning varnish for tanks. Allow me to mention that this is incorrect, at least in my case. Having a new 2½ h.p. Douglas, I wished to prevent the benzole from spoiling my tank, and, therefore, gave it a coat of Shellac varnish. The result is that whenever the benzole escapes now, a white stain is left behind, which can only be removed by the application of paraffin, which also takes off the first coating of enamel. I consider its effect very injurious.

T.H.

Redhill.

PRICE OF BENZOLE.

Sir,—The Automobile Association is informed by the National Benzole Association that the price of benzole conforming to the specification approved of by us is 2s. 8d. per gallon in fifty-gallon drums, and 2s. 9d. per gallon in two-gallon tins. While there is every hope that these prices will be still further reduced in the future, the following figures may be of interest to your readers as showing the advantage of using benzole: Price of No. 1 petrol to-day 3s. 1d. per gallon at most garages. Price of N.B.A. benzole 2s. 9d. Initial saving 4d.

It must further be remembered that at least 15% more mileage can be obtained from benzole than from the best petrol, and therefore the equivalent price per gallon of benzole to petrol is 2s. 4d. for the former, as against 3s. 1d. for the latter.

STENSON COOKE,
Secretary, the Automobile Association and Motor Union.

INFORMATION WANTED.

Sir,—Mr. R. A. Guthrie asks for some details of Mesopotamia. I have recently returned from Basra, and my advice is as follows:

(1.) Do not worry about dust; it will not be worse than English roads in summer, and will be too deep to ride in.

(2.) You will not worry about the heat affecting the tyres; if you go now it will take you all your time to keep yourself cool enough to live, and if you take the machine you

will forget all about it when you get to Basra. There are good hospitals in Bombay.

(3.) Basra-Baghdad district is rather wide. You will be lucky to get to Baghdad by boat up river in ten days from Basra.

(4.) Leave it at home. Buy an Army machine there if you still want to do a bit of exploring. Do not take any jewellery if you decide to do a lone trek—if you can get permission. Better still, stop at home and read about it.

C. H. KELK, R.E.

A 'VARSITY T.T.

Sir,—Would it not be practicable to arrange a motor cycle speed event—Oxford v. Cambridge—which might, in course of time, become a recognised annual 'Varsity T.T.?

The race would be held over the I.O.M. course, would be run under the A.C.U., and competitors would all be members of either of the universities *in statu pupillari*—as it is elegantly expressed—at the time of competing.

Class 1.—Solo machines, unlimited c.c.

Class 2.—Sidecar machines, unlimited c.c.

Class 3.—Solo machines not exceeding 550 c.c.

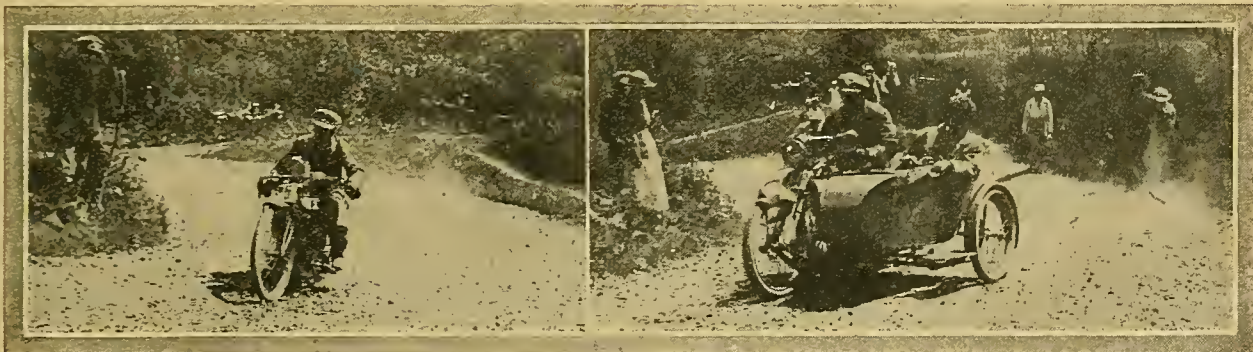
Mileage: Two circuits only to avoid undue strain to private machines; date during the Long Vac. August each year.

This would institute what might possibly prove to be the most popular annual event in the motor cycle world, bearing, as it would, the hall-mark of sporting amateurism. Neither have I any doubt that, in the event of the race being organised, the cups also would rapidly make their appearance from various sources. There is scope for much further elaboration of this scheme; I shall watch your columns with great interest to see how the proposal is received.

St. John's, Oxford.

H. MILLETT.

[This excellent idea has been placed before Mr. T. W. Loughborough, the secretary of the Auto-Cycle Union, who gives it his most hearty approval. In view, however, of the difficulties of organisation this year, he thinks it will be impossible to hold the race until 1920, when the event should receive every encouragement and assistance, and, in his opinion, should be a thoroughly sporting affair.—Ed.]



Scenes on Porlock during the Birmingham M.C.C. Trial for the Lycett Trophy. (Left) C. H. Hartwright (2½ h.p. New Imperial). (Right) L. Newey (4½ h.p. Ariel sidecar). Both competitors completed the double journey.

GOVERNMENT MOTOR CYCLES FOR EX-OFFICERS—AND MEN.

Sir,—May I beg a small space in your valuable paper in reply to C. Fitzgerald A. Bird's letter which appears in the issue of *The Motor Cycle* of June 5th.

He asks for concessions to be made to officers in the matter of the sale of Government motor cycles. It is a pity that he should exclude N.C.O.'s and men, who have seen just as much service, and who have made the same sacrifice as officers.

Another point that he seems to forget is that, with the amount of his gratuity so much in excess of that of the ranker, I suggest that the officer is in a better position to pay the market price for a mount.

Hampstead.

A DEMOBILISED PRIVATE.

HILLS ON WHICH I HAVE FAILED.

Sir,—Referring to the letter of "Sunbinks" in your issue of May 29th, making a comparison between various British hills.

I have never had the pleasure of seeing some of these Northern hills, except Houlster and Kirkstone, but so far as the Midlands, and Wales, and the South are concerned, does anyone know a longer or steeper hill than Alt-y-bady at Llangollen, the one that leads over the hill to Glynceiriog?

In 1912 I developed a craze for searching out stiff climbs, and this was certainly the stiffest hill that I struck that had got a genuine roadway wide enough for a vehicle to pass by, or for two sidecars to pass.

Compared to it, the Cotswold Hills (like Rising Sun, etc.) are quite trifles.

I have never heard of this hill (Alt-y-bady) having been included in a trial. Can anyone tell me?

NORA HOUGH.

[On September 27th, 1913, the solo riders were sent up this hill in the North Wales Trial held by the Liverpool A.C.C.—Ed.]

SCOTTISH FERRIES.

Sir,—I live in the vicinity of Inverness, and may say that A. Scott Freeman is quite wrong in stating that passes are now required for the far North. No passports whatever are necessary.

I recently travelled from Edinburgh on my lightweight Wolf. I may say that the roads are not at all bad, except some miles past Aviemore, and the main road North, as far as Brora anyway, is quite good too, excepting between Alness and Tain. Tourists might increase the pleasure of their trip by cutting down to Nairn from Carr Bridge by a byroad, which is in excellent order, and time may be profitably saved by going from Alness over the hills to Bonar Bridge. There is also a short cut again from Bonar Bridge almost directly to The Mound, of which advantage is rarely taken. June, July, and August are the best months for seeing the Highlands, and tourists should not fail to spend a night in Inverness, so that they can see the usual places of interest and also the following historic landmarks: Culloden Moor, Castle Tolmie, the Ould Bught Mill, Queen Mary's House, Demster Gardens, and Baron Taylor's Lane, where permission is readily given by John Brown, Esq. (the proprietor), to view the famous "Iona Martlecracked Sink Basin"; also the imposing islands known locally as Smith's Island.

DAN MACDONALD.

MOTOR CYCLE TRIALS.

Sir,—Much has been said and written about the unsatisfactory results of the trials lately held, and I am entirely in agreement with Mr. J. L. Norton and others that a more satisfactory method of "finding the winner" should be adopted.

Competitors, the trade and public alike, will welcome any scheme whereby one man is pronounced "the winner," as one horse wins "the Derby."

To this end my club, the Midland Cycling and Athletic Club, is aiming in its open reliability trial on June 28th.

As a member of the committee responsible for the trial, I can assure those interested that much thought has been given to the matter, recognising how difficult it is in these days of superlative machines and expert riders to give the "knock-out" under reasonable conditions of riding, as it should, in my opinion, be ruled out to include freakish ideas in reliability trials. Make them difficult by all means, but always possible.

The club is fortunate in having the services of Mr. Alec

Ross, known by every club as an official starter and marker in most important trials all over the United Kingdom, and Mr. Frank Whitworth—the original organiser of the Colmore Cup trial.

As there are four silver trophies to be awarded in this trial, as well as a premier trophy, the club is naturally anxious that there shall be no uncertainty as to who are the rightful holders of them at the end of that day.

Having these points in mind then, here is our programme:

- (1.) An extended course of 200 miles—rather longer than are most one-day trials—including six stiff hills.
- (2.) A brake test on a severe gradient of about 1 in 4.
- (3.) A stop and restart test on a gradient of about 1 in 6.
- (4.) A flexibility test; in the way this is being set out we consider it is original, and likely to prove efficient in determining the actual winner of the trophy without any question.

It follows the Colmore Cup lines, inasmuch as the slow time upon the flexibility test hill is divided by the fast time, but a new and original feature added to this is that the various types of machines have their chances equalised by dividing each rider's figure of merit by the average figure of merit of the riders on the same type and size of machine.

(5.) The timing in the trial will not be dealt with in any way on the split seconds idea, and marks will not be deducted unless the two minutes' variation is exceeded, i.e., one minute each way, which means that so long as the riders look after the minutes they need not trouble about the seconds.

(6.) Consideration will be given to the competitors in the matter of intervals, as we take them eighty miles on the first stretch, when a stop is made for a second light breakfast, and after a further fifty miles another interval for lunch. The final stretch of seventy miles is an uninterrupted run home.

If Mr. Norton (or anyone interested in motor trials), after reading what the club proposes to do, is not satisfied that a definite winner will be found by this means, the club would be most happy to receive any suggestions, which I shall be pleased to have and deal with.

C. F. DAWES.

O.K. Works, Hall Green.

FOUR-STROKE V. TWO-STROKE.

Sir,—I agree with "R.N." re two-strokes in all points except "hill-climbing." A two-stroke may beat a single of equal capacity on hills, but it certainly will not beat a twin. I have taken a Douglas up Red Hill (Axbridge-Bristol road) on top gear, and I should like to meet the 2½ h.p. two-stroke that would do this on a 5½ to 1 gear. Also, re overheating, I have driven the same machine for seven miles at 42 m.p.h. by Jones speedometer (Newbury-Reading road); the engine then only began to tire on up grades, but after a mile at 25 m.p.h. it regained its vigour.

Re spare parts, I think the Government is to blame in many cases. I was unfortunate some time back in breaking my gear box main-shaft (clutch model). I cannot obtain a new one owing to Government restrictions. Douglas Motors, Ltd., supplied me with the ordinary two-speed shaft and a fixed pulley; but I miss the clutch, and now often see riders of the same model who are using this shaft that I want, while having discarded the kick start and clutch operating mechanism.

DUGGIE.

Cambridge.

SUMMARY OF CORRESPONDENCE.

A correspondent recently borrowed a pump from Mr. A. Edwards, promising to leave it at the temperance hotel in High Street, Evesham. Finding four temperance hotels in that street on arrival at Evesham, he left the pump at Restall's Railway Temperance Hotel.

NOW READY.

HINTS & TIPS FOR MOTOR CYCLISTS.

Second reprint of Sixth Edition.

Invaluable to motor cyclists overhauling their machines.

Price 2/-, by post 2/3.

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QUESTIONS AND REPLIES

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C.4, and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

Clutch Adjustment.

? How does the Clyno 1912 multiple clutch work? Supposing the clutch slipped, would you tighten it, because, when tightening the front nut, you push the whole of the outer shell against the back ball race?—G.T.

The Clyno clutch cannot be adjusted, and, if worn to any degree, extra plates must be inserted. Care must be taken in re-assembling to see that the cone nut is screwed up to the correct position according to the adjustment marks, otherwise trouble will certainly result.

The Lighting Regulations.

? I am given to understand that there is some special regulation concerning the size of lamps for roadway illumination on motor cycles and sidecars. I should be obliged if you could give me the necessary information on this point.—C.S.

Unless a lamp is fitted with a burner exceeding fourteen litres per hour, or an electric bulb exceeding twelve watts, and unless the front glass exceeds 6in. in diameter, there are no restrictions. In the case of these limits being exceeded, the glass must be obscured with ground glass, paint, or some other uncoloured material, so that the obscured effect is less than that produced by one thickness of ordinary white tissue paper.

Substituting Carburetters.

? I have bought a second-hand $3\frac{1}{2}$ h.p. Triumph, numbered 6,212, and shall be glad to know: (1.) What year was this machine made? (2.) What is the average consumption of petrol? (3.) Can you recommend me a Binks carburetter for economy in preference to a B. and B., which is on the machine? (4.) What position should the piston be in for giving best all-round results when timing the magneto?—H.B.

(1.) Write to the makers, the Triumph Cycle Co., Ltd., Priory Street, Coventry, giving them the number of the engine, and they may tell you the date of machine. (2.) Solo, ninety miles to the gallon. (3.) One carburetter is as good as another in this respect, and petrol consumption depends on the driver and the way in which the carburetter is adjusted. (4.) A method of timing is fully described in our handbook, "Motor Cycles and How to Manage Them." Approximately the piston should be on the top dead centre of the compression stroke, with the ignition lever two-thirds retarded, when the magneto contact breaker points are about to separate.

Difficult Starting.

? (1.) How does a Diesel engine work? Can it be run on ordinary lubricating oil and paraffin without injecting? (2.) I have a 5-6 h.p. Indian which I find difficult to start. If I were to connect the two wires of a four-volt battery, one to the frame and the other to the cut-out terminal, and walked the bicycle slowly along, when the contact breaker broke, would it induce a high-tension current in the outer winding and fire the mixture? (3.) Will you kindly tell me the address of the Thor motor cycle people?—O.T.H.

(1.) The Diesel is an engine relying on its compression to ignite the fuel charge. On the compression stroke only air is present in the cylinder. At the top of the stroke, when the air is fully compressed, and, therefore, at a high temperature, a quantity of the fuel is injected, and, of course, burns. Heavy oils and paraffin can be used, but we do not quite understand what you mean about injecting, as this is one of the vital principles of the engine. (2.) If you connect the battery wires up as you suggest, you will merely short the high tension current, and no spark at the plug would result. The magneto current is alternating, and the battery gives a direct current. (3.) The

address of the Thor motor cycle makers is Messrs. The Independent Pneumatic Tool Company, 600, West Jackson Boulevard, Chicago.

Purchasing by Proxy.

? A few days ago a friend of mine saw a machine which he thought would suit me, and he left a deposit of £1 and arranged for the machine to be ready for trial and inspection. As it did not come up to my expectations, I failed to come to terms with the dealer, who now refuses to return the deposit. Can you please advise me if this is in order, and, if not, what steps I should take to recover the amount?—F.C.G.

Unless the motor dealer successfully disputes the statement contained in your letter, you can issue a County Court summons for the return of the deposit paid, and you would have to bring your friend as a witness to show that the £1 was not paid as a deposit in respect of the purchase of the machine, but simply as security while you had it for trial and inspection, and that it was fully understood that the machine could be returned if you did not care to purchase.

Claim for Repairs.

? I should be glad of your advice on the following: I sold my $2\frac{1}{2}$ h.p. Connaught for £25, with lamps and horn complete. Purchaser was offered any trial he liked to give the machine. On account of never having previously ridden a motor cycle, he declined the trial, but paid for the machine, and asked me to deliver at his address two hours later. The machine was delivered running perfectly. Afterwards purchaser complained of trouble, non-starting, etc., which I put down to No. 3 war spirit and his lack of experience. The result is, of course, the machine is taken to a repairer, who fits new piston rings and charges £3 10s. for repairs, after keeping the machine three weeks. The purchaser sends the bill to me, intimating that in case of non-payment I shall hear more about it. Can I be made to pay this? The repairer says it is a comfortable, speedy mount, and desires to buy it. I myself have offered to take it back, but the price is now £28 10s. I have declined to pay or have anything further to do with it. Can I be compelled to pay this £3 10s.?—R.M.

Your letter does not disclose any right for the purchaser to claim successfully the £3 10s. he mentions, and we therefore think you should resist any such claim.



The silver challenge cup presented by the Raleigh Cycle Co. to the Nottingham District M.C.C. for annual open competition. Its value is 100 guineas.

Fitting Oversize Tyres.

? (1.) Is a 2½ in. tyre entirely satisfactory on a 2½ in. rim? I have the wheel out at present and several new spokes, and possibly rebuilding will be necessary. The machine is a 4½ h.p. and sidecar, and seems to be under-tyred with 2½ in. covers all round. (2.) How is a Bosch magneto sprocket fastened to the magneto?—E.B.

(1.) No; not unless it is a 2½ in. tyre built specially to fit a 2½ in. rim. The machine certainly seems to be under-tyred. (2.) The sprocket is a taper fit on the shaft, and is held in position by a nut.

Loss of Compression.

? I have a 1915 2½ h.p. Douglas and have had trouble with the compression in the front cylinder. I can get good compression for a few days, after which, for no apparent reason, it will mysteriously disappear to reappear again just as mysteriously after a short time. The engine is quite clean and well lubricated with good oil, and recently I fitted new piston rings with a view to curing the trouble. When the compression is poor there is hissing from the cylinder when turning the flywheel. Whether the engine is hot or cold seems to make no difference. I might add that, on turning the flywheel backwards, there is no hissing, and the vacuum set up in the cylinder renders the flywheel as stiff to turn as good compression. I should be much obliged if you could give me some explanation and tell me of a satisfactory cure for this trouble.—M.R.W.

The loss of compression is probably due to the valve tappets of the front cylinder requiring adjustment. Evidently there is too little clearance, and when the engine gets hot the valve stems expand and the valves do not close. It is possible that the piston ring slots are in line.

Converting a Triumph.

? I have a 1913 clutch model Triumph in good condition. Would you kindly tell me whether I could convert it into an efficient sidecar machine by the addition of a Philipson pulley, or would you advise selling it in favour of a similar machine with three-speed gear?—R.H.C.

We should certainly advise you to procure a machine fitted with three-speed gear in preference to fitting an adjustable pulley for sidecar work.

Timing a Twin.

? I have taken the engine of my a.i.v. 5-6 h.p. twin down for a small repair and have upset the valve and magneto timing, but they are not marked. What is the correct timing for this twin?—A.H.S.

In twins with automatic inlet valves, it is only necessary to time the rear exhaust valve; this is done by revolving the engine in the direction in which it usually runs until the rear piston is about ½ in. down the stroke, when the exhaust valve should just have closed. To time the magneto, turn the engine over one further revolution in the same direction so that the rear piston is ½ in. down the firing stroke, place the spark advance lever in the fully-retarded position, and revolve the magneto armature, which is disconnected, until the points are just about to separate on the cam marked 1, then, keeping the piston and the magneto in this position, connect up the transmission again.

READERS' REPLIES.**Mysterious Trouble with a Two-stroke.**

Referring to your reply in the issue of May 29th to "A.W.," who cannot get his two-stroke to fire after running under compression downhill, the same thing happened to me twice. On both

occasions the timing of the magneto had slipped, and I attributed it to a back-fire. A certain amount of mixture is drawn into the cylinder and, running slowly downhill, the spark is too far advanced and a back-fire is caused, which alters the magneto sprocket wheel. I am endeavouring to prevent recurrence of this trouble by fully retarding the magneto when running slowly with the throttle closed.—F. A. HANKS.

I note in *The Motor Cycle* of May 29th "A.W.'s" mysterious trouble with his two-stroke. Mysterious, it is indeed, and, from my experience, it is uncanny. After the engine ceases to tick when coasting downhill, no amount of throttle manipulation will make my Radco strike up again. I generally, when near the bottom of the hill, put on half throttle, air a quarter, and lift and drop release quickly two or three times, and if this fails to make the engine fire I flood carburettor and repeat above. To overcome the trouble I sometimes shut down the throttle until the engine ticks occasionally and work on the release, which is bad, I know. A cut-out switch connected to terminal on magneto contact breaker cover works well, but engine starts up with a loud bang. My engine, I may add, works splendidly otherwise, and has just been overhauled, and everything seems to be set right.—H.R. (Cockermouth).

Stuck Rocker Arm.

Further to the query of your correspondent, "D.B.H.W.," regarding the stuck rocker arm on the magneto, I have a Bosch fitted to my B.S.A. which suffers badly from this disease in wet weather, but the best tool I have discovered for reamering the hole out in the fibre bush is the long locking screw which one has to take out before the make and break will come adrift. The diameter of this screw over the threads is just O.K., and if pushed (not screwed) through the fibre bush a few times it leaves a hole the correct size. An extension of this idea would be to have the unthreaded portion of the screw fluted like a reamer just above the screw threads.—G. W. LAMBERT.

RECOMMENDED ROUTES.**CHELMSFORD TO FELIXSTOWE.—S.P.S.**

Chelmsford, Witham, Colchester, Capel St. Mary, Felixstowe. Approximately 63 miles.

ALFORD TO NORWICH.—J.H.

Alford, Spilsby, Boston, Sutterton, Fosdyke, Holbeach, Long Sutton, King's Lynn, Swaffham, Dereham, Hockering, Norwich. Approximately 114 miles.

AMERSHAM TO NEWTOWN (N. WALES).—F.H.G.

Amersham, High Wycombe, West Wycombe, Wheatley, Islip, Bletchington, Enstone, Chipping Norton, Evesham, Worcester, Tenbury, Ludlow. Craven Arms, Bishop's Castle, Newtown.

TENTERDEN TO BRISTOL.—T.R.H.

Tenterden, Goudhurst, Tunbridge Wells, East Grinstead, Horley, Redhill, Reigate, Dorking, Gomshall, Guildford, Worplesdon, Bagshot, Wokingham, Reading, Theale, Newbury, Hungerford, Marlborough, Chippenham, Bath, Bristol. Approximately 172 miles.



THE LONDON-EDINBURGH RUN.

Competitors being checked at York. The makes of machines shown are, reading from left: Matchless, Zenith, Triumph, and Sirrah Verus.

MISCELLANEOUS ADVERTISEMENTS.

PRICES.

ADVERTISEMENTS in these columns.—First 12 words or less 2/-, and 2d. for every additional word. Each paragraph is charged separately. Name and address must be counted. Series discounts, conditions, and special terms to regular trade advertisers will be quoted on application.

Postal Orders and Cheques sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd.,** and crossed **& Co.** Treasury Notes, being untraceable if lost in transit, should not be sent as remittances.

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.4), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge, which must include the words Box 000, c/o "The Motor Cycle." Only the number will appear in the advertisement. All replies should be addressed No. 000, c/o "Motor Cycle," 20, Tudor Street, E.C.4. Replies to Box Number advertisements containing remittances should be sent by registered post.

In the case of motor cycles offered for sale under a box number, as it is unusual for these to be sold without first being inspected by the intending purchaser, advertisers will facilitate business by embodying in their advertisements some mention of the district in which the car offered may be seen and tried.

DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pays carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged: when under £10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

MOTOR CYCLES FOR SALE.

A.B.C.

EARLIEST Deliveries of A.B.C.; book your order now.—Witham Bros., Newport, Wight. [1355]

JONES' Garage, special agents for A.B.C., Broadway, Muswell Hill, N.10, and Woodside Parade, North Finchley. [2936]

CROW Bros., High St., Gailford, have contracted largely for the new A.B.C. Order now for earliest delivery. [5298]

LIVERPOOL and District Agents for A.B.C. Place orders now to secure early delivery.—Victor Horsman, Ltd., 9, Parr St., Liverpool. [0003]

A.B.O.—Sole agents for these famous machines. Orders booked now for early delivery.—Chandler, Reyre, and Williams, Saa St., Hitchin. [0996]

A.B.C. Distributors for North Derbyshire, book your orders now to ensure early delivery.—W. R. Sanders and Co., Ltd., Sanders' Garage, Buxton. [X3644]

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OF

DOUGLAS JAMES SUNBEAMS

We want our clients to fully realize that in order to obtain these machines, we had to pay considerably more than the makers' list price, and are offering them at a figure that allows us a very small margin of profit

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DOUGLAS 2½ h.p., 2-speed, standard W.D. Models **£78-£80.**

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SUNBEAM, 3½ h.p., 3-speed clutch, kick starter, chain drive, standard war model **£125.**

These are all brand new machines, in original makers' crates, and are offered subject to being unsold.

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Telephone: Museum 557.

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100 Paris St.,

EXETER.



MOTOR CYCLES FOR SALE.

A.B.C.

A.B.O.—Distributors for Scotland. Book your order now to ensure reasonable date for delivery.—Edinburgh Pioneer Motors, Ltd., 50, Girdroy, St. Edinburg. [X8301]

FANCOURT'S Garage, Stamford, for A.B.C.'s; sole distributing agent for Soke of Peckham and County of Rutland; particulars and illustrations on request. [X9724]

NORTH Ayrshire.—Place your orders now. Early delivery of A.B.C. Demonstration runs arranged by appointment. You are interested, so write.—Uppan, Glangarack. [2457]

WE Are Now Booking Orders for earliest deliveries of A.B.C. motor cycles. Secure an early delivery by placing your order with us now.—Dawwells' Garage, Wigaa. Tel.: 328. [X3219]

A.B.C.—Book early and prevent disappointment. Specification and full particulars will be sent on application.—The Spalding Motor Co., Ltd., Spalding, distributing agents for Lincolnshire. [X6969]

DAN BRAEBURY, 224, London Rd., Sheffield, sole A.B.C. distributing agent for Sheffield and district, will give you earliest possible delivery of the new A.B.C. motor cycles and light cars. [7270]

Abingdon.

A BINGDON, K.D., 1919, 3½ h.p., T.T., only done 80 miles; nearest offer 70 gns.—Deacock, Springfield Farm, Colgate, Sussex. [3742]

A BINGDON King Dick, 6 h.p., Bosch, R.B., 2 speeds, free engine, C.B. sidcar, underslung, lighting set, fast and reliable; £63.—Collins, 21, Pultford St., S.W.1. [3956]

K ING Dick Abingdon, 1915, 4 h.p., Jardine 4-speed countershaft, Bosch, 1919 Amac, lamps, all accessories, small mileage, stored 2½ years, tyres perfect. £68; with 1919 coach sidcar, £87; seen any time.—Crawwell, 53, Ilford Hill, Ilford. [X3705]

A.J.S.

JACK HEALY, Cork.—Official A.J.S. agent.—Garage and works, Drinaa St. [X8336]

A J.S. Sole District Agents have approaching deliveries.—John Aldridge and Co., Diss. [3668]

A J.S. 1914 6 h.p. Combination, perfect condition, all accessories; £110.—Apply, Fogg, Sandycroft, Hockley. [X3685]

A J.S., 1916, 6 h.p., spare wheel, 3-speed, F.E. De Luxe sidcar; £160.—228, Kilburn Lane, Paddington, W.10. [4035]

A J.S. 1916 (Sept.) 4 h.p. Combination, all in perfect condition, and well equipped; any trial; £125.—Box 4,107, c/o The Motor Cycle. [X3546]

A J.S.—For quick deliveries try the sole Leicester agent, Will Chapman, 113, Belgrave Rd., Leicester, the first appointed A.J.S. agent. [3531]

A J.S. 6 h.p. Combination, 1914, 3-speed, countershaft, kick start, good condition; best offer accepted.—Blakeley, 96, Goddard Av., Swindon. [3383]

6 h.p. A.J.S. Combination, late 1914, 3-speed, clutch, kick starter, fine condition, little used last 3 years, Lucas lamps, horn; 110 gns.—Overton, Lelantwade. [X3639]

A J.S.—Exeter Motor Cycle and Light Car Co., Ltd., Bath Rd., Exeter, and 28, Tavistock Rd., Plymouth. Sole agents. Now booking for earliest deliveries. [0007]

A J.S. 1915 6 h.p. Combination, 3 speeds, hand clutch, 3 interchangeable wheels, lamps, horn, A.J.S. coachbuilt sidcar; £115, or nearest offer.—11, Southgate St., Gloucester. [3624]

A J.S., 2½ h.p., 1915, kick start, clutch, 2-speed, detachable cylinder head, front tyre slightly cut, otherwise perfect condition; £49, lowest.—14, Victoria Crescent, Newport, Mon. [X3654]

A J.S., 1913, 6 h.p., 2-speed, and Canoelet sporting sidcar, completely overhauled by makers, new tyres, lamps, speedometer; £87.—Before 7 p.m., 2, Newport Rd., Barnes, S.W. [3692]

19 19 Post-war 6 h.p. A.J.S. Combination, wind screen, spare wheel complete, only delivered few weeks; absolutely perfect, mileage 600; £180; Wiltshire district.—Box L2,023, c/o The Motor Cycle. [4017]

A J.S. 1919 Peace Model 6 h.p. Combination, delivered by makers May, the smartest, most comfortable, and reliable combination procurable; best offer over £175; private owner.—Box L2,021, c/o The Motor Cycle. [3868]

2½ h.p. A.J.S., semi-T.T., 3-speed, hand clutch, just 24 overhauled cost of £13, rebushed, new rings, sprockets, chains, tyre, new gears throughout, P. and H. lamp set, horn, very fast; best offer £65.—Walker, Abbey Gateway, Malvern. [X3680]

19 16 6 h.p. A.J.S. and Sidcar, outfit good as new, machine ridden 600 miles solo and 300 with sidcar, complete with speedometer, dissolved acetylene lighting, horn, screen, and tools; real genuine first-class lot; £150.—J. C. Phipp, Sherston, Malmesbury, Wilts. [3690]

MOTOR CYCLES FOR SALE.

A.J.S.

A J.S. Spares; engine and gear box repairs; prompt delivery.—Cecil Williams, Chapel Ash Depot, Wolverhampton, T.A.: Parts. [1089]

Alcyon.

ALCYON 2½ h.p. Lightweight, smart model, lamps, horn, etc., tyres and belt as new, ride away, very fast, in good condition: £30, or offer.—Apply (after 7 o'clock), Davies, 54, Greenfield Rd., S. Tottenham, N 16. [3680]

Alldays

ALLON.—Callyus, Ltd., Eastbourne, for delivery shortly. [0017]

1912 Alldays, 3½ h.p., 2-speed, Binks, lamps, horn, in good order: £40.—29, Brudenell Rd., Leeds. [X3551]

ALLDAYS Matchless, 1914, 2-stroke, in really good condition: £33, or offer.—104, Plough Rd., Battersea. [4047]

1919 2½ h.p. Alldays Allon, as new, all lamps, horn, and tools: £60, no offers; perfect.—Day, Okehampton. [3596]

JONES' Garage, special agents for Alldays Allon, Broadway, Muswell Hill, N.10, and Woodside Parade, North Finchley. [2931]

ALLDAYS Allon.—Orders booked now will ensure early delivery.—W. R. Sanders and Co., Ltd., Sanders' Garage, Buxton. [X3645]

ALLDAYS Allon, 2-speed, 2-stroke, hand clutch, original tyres, all as new, expert examination invited: £45.—Budden, Tailor, Bridport. [3638]

ALLON 2½ h.p., 2 speeds, nearly new tyres, Lucas lamps, horn, and spare generator, just completely overhauled, full tool kit, spares, etc.: £55; consider offer.—11, Barnsley Rd., Birmingham. [X3592]

ALLON 2-stroke, nice condition, 2 speeds, engine thoroughly overhauled, new tyres, complete with Miller's lamp and generator, horn, pump, and full tool kit: £49.—Box L2,029, c/o The Motor Cycle. [4024]

ALLON 1919 Models, 2-speed, 2-stroke. Orders booked now will ensure early deliveries: 1919 single-speed models, 7 to 10 days.—George Smith's Motor Cycle Depot, Clapham, Junction. 'Phone: Battersea 1271. [3033]

1916 Alldays Allon 2½ h.p., 2-speed, 2-stroke, hand-controlled clutch, almost new Clincher de Luxe heavy non-skid tyres, lamps, horn, tools, etc., well cared for, and in perfect order throughout: £50.—Arenco-Jones, Kingston Manor, near Taunton. [3796]

Ariel.

ARIEL 2½ h.p., Amac, U.H. magneto: £18/10.—12, Thesiger Rd., Penge, S.E. [3869]

ARIEL 3½ h.p., variable gear: £40.—48a Rochester Place, Camden Rd N.W.1. [3912]

CROW Bros., High St., Guildford.—Ariel agents since 1913. 1919 deliveries have begun. [5299]

ARIEL 3½ h.p., mag., excellent tyres, fast; ride away: £30.—106, Highbury New Park, London. [X3581]

ARIEL, 1914, 3-speed, K. start, clutch, takes sidecar, splendid condition: £55.—Lindfield, High St., Crawley, Sussex. [3755]

JONES Garage, special agents for Ariels, Broadway, Muswell Hill, N.10, and Woodside Parade, North Finchley. [2929]

ARIEL 3½ h.p. and 6-h.p.: early deliveries.—F. Speakman, Ariel Expert, 7, Rochdale Rd., Harpurhey, Manchester. [5269]

3½ h.p. Ariel, wheels 26x2½, good sound tyres, C.A.V. 32 mag., ride away: £19.—26, Springdale Rd., Stoke-Newington, London, N. [3386]

1916-17 3-speed, countershaft, kick start, coachbuilt Ariel combination, 3½ h.p.: first offer over £22; as new; after 7.—H.C.G., 64, Powerscroft Rd., Clapton, E.5. [X3483]

ARIEL 1912 Combination, 3 speeds, clutch, lamps, electric horn, speedometer, and accessories, in good running order: £50.—Lambert, 11, Goose Yard, St. John St., E.C. [3326]

ARIEL 4 h.p. T.T., splendid condition, 3 speeds, head lamp, mechanical horn, knee grips, very fast: £55; seen by appointment.—P.F., Rising Sun Hotel, North End, Croydon. [3613]

ARIEL 7 h.p. Coachbuilt Combination, 1916, 3-speed, kick starter, lamps, luggage grid, spares, excellent condition: £120, or nearest offer.—Topham, Springfield Farm, Colgate, Sussex. [3713]

Arno.

ALL Red Arno, 1911, 4½ h.p., Simms mag.: £22/10; no baggers.—Call evening, 5, Thames View, E. Molesey. [X3602]

Auto-Wheels.

AUTO-WHEEL, about 1915, £10, with 3-speed cycle £16.—12, Thesiger Rd., Penge, S.E. [3405]

WALL Auto-Wheel, perfect running order, little used: £10.—Bambridge, Pevensey Bay, Sussex. [3841]

WALL'S Auto-Wheel: £10, no offers; perfect running order.—Allen, Barnwell, Peterboro'. [X3375]

WALL Auto-Wheel, little used, all fittings: £10; seen after 6.—11, Avenue Gardens, Acton, W.3. [3782]

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MOTOR CYCLES FOR SALE.

Auto-Wheels.

AUTO-WHEEL (Wall's), splendid running order, little used: £12.—Winter, 4, Ashchurch Park Villa, Shepherd's Bush. [3544]

AUTO-WHEEL for sale, £14, perfect; write for appointment.—Hall, Hockham Cottage (next to Green Man Hotel), Whetstone, Middlessex. [3506]

Bat.

8 h.p. Bat Combination, splendid outfit, first-class condition: £120, or near offer.—The Model Mart, 14, Conway Rd., Plumstead, London. [X3597]

B.A.T., 6 h.p., heavy sporting grey model, 3-speed, clutch, 1913, and sporting sidecar, new tyre, etc.; any trial: £60.—36, Southwark Park Rd., S.E. [3490]

3½ h.p. Bat, spring frame, J.A.P. engine, in good order, powerful, recent £26; also two new carburettors, latest pattern, B.B. top feed, variable jet, suit twin, £2/10; and latest Scuspay £2, both complete.—Coleman, 14, Elderberry Rd., Well Hall, S.E.9. [3401]

Bat-Jap.

BAT-J.A.P., 4½ h.p., fixed gear, perfect, complete: £37/10.—35, Wellhouse Rd., Barnoldswick, Via Colne. [X3489]

6 h.p. Bat-Jap Combination, free engine, new back tyre and tube, new belt, lamps: £60.—Withers, 4, College Rd., Waltham Cross. [3598]

BAT-J.A.P.—Speed merchants only. 5-h.p. twin Brooklands model racer, engine rebushed, perfect condition, tyres new; no dealers; no offers: £60. Send stamp for reply.—Box L1,967, c/o The Motor Cycle. [3498]

8 h.p. Bat-Jap Combination, tandem coachbuilt sidecar, 2-speed countershaft, foot starter, all-chain drive, Bosch, lamps, horn, exhaust whistle, new tyres, just overhauled and enamelled, perfect condition: £110, or nearest offer.—Hankey, Accrington Rd., Burnley. [X3652]

Blackburne.

CROW Bros., High St., Guildford, are old Blackburne agents, and can give early deliveries. [5300]

BLACKBURNE.—Sole agents. Book now for early delivery.—Chandler, Reyre and Williams, Sun St., Hitchin. [0999]

1919 Blackburne 4 h.p. 3-speed Countershaft Combination, excellent condition: £87.—Gardiner, 6, Highcliff Av., Cedar Rd., Southampton. [3732]

Black Prince.

BLACK Prince.—We apologise to all enquirers for catalogue; same will be forwarded as soon as to hand. Note new prices: 3½ h.p. 50 gns., 2½ h.p. 45 gns.; with disc wheels, patent pressed steel frame, patent 2-speed gear box, with rear springing and shaft drive.—Black Prince Motors, Askern, Doncaster. [3872]

Bradbury.

BRADBURY 4 h.p., with coachbuilt sidecar, good condition: £48.—R., 44, King Edward St., Slough, Bucks. [3624]

4 h.p. Countershaft 3-speed Bradbury, coachbuilt sidecar: £80.—Platts, 602, King's Rd., Fulham, London, S.W.6. [3787]

BRADBURY.—For early deliveries of 1919 model, write W. R. Sanders and Co., Ltd., Sanders' Garage, Buxton. [X3646]

BRADBURY, 1914, Sturmeys-Archer 3-speed and clutch, with lamps and sidecar: £52.—Hole, 129, Park Lane, Carshalton. [3775]

BRADBURY.—For the earliest possible deliveries of 1919 models try the sole Manchester agent, Tom Davies, 229, Deansgate, Manchester. [6662]

1914 4½ h.p. Bradbury, pedal start, 3-speed, twin-cyl., excellent condition.—Park View, Alden Rd., near Morden Station. Tel. Wimbledon 615. [3661]

4 h.p. Bradbury Semi T.T., adjustable pulley, lamps, etc., condition excellent, ride away: £32.—Wilson, 28, Portsmouth St., Barrow-in-Furness. [X3480]

BRADBURY 4 h.p. Combination, 2-speed, countershaft, kick start, excellent condition; any trial: £65.—Stevens, 184, Pentonville Rd., King's Cross. [3680]

BRADBURY 4 h.p., 1913, single speed, excellent condition, very fast, lamps, horn, etc., spare valves and belt: £35.—W. Plowman, 10, West End Lane, Kilburn, N.W.6. [3987]

BRADBURY 4 h.p., clutch, very powerful, perfect order, condition new, and sporting, take sidecar; after 7 p.m.—Cpl. Colledge, Vine Lodge, Cotterham Park Rd., Raynes Park, S.W. [3919]

1913 4 h.p. Bradbury, 2-speed N.S.U. gear, thoroughly overhauled, new cylinder, complete, fitted torpedo side entrance wicker sidecar: £55.—Pressland, The Sub, Gloucester Rd., Hampton, Middlesex. [X3270]

BRADBURY, 1914, 4 h.p., free engine, adjustable pulley, Bosch, heavy Dunlops and belt, new May, lamps, horn, tools, just overhauled, splendid condition: 45 gns.—Underwood, Wetherden, Stowmarket, Suffolk. [X3207]

BRADBURY, with coachbuilt sidecar, 4 h.p., 1914, 3-speed countershaft, all chain, clutch, Bosch, 2 horns, tyres in good order, electric side and rear lamps, 4-volt accumulator, acetylene head lamp and generator, expanding back brake, recently overhauled, all in good condition: £90, no offers.—24, Sollershott Green, Letchworth. [3556]

MOTOR CYCLES FOR SALE.

Douglas.

23b.p. Douglas, 1914, kick start, new jacketed 24 Amac, new heavy tyres, disc wheels, 2 lamps, generator, horn, spares, mileage 5,500, photo; £70.—Rickett, Brockham House, Brockham, Betchworth (1) [X3476]

LATEST 1919 4hp. Douglas Combination, just as received from the makers (not a War Office machine), been few miles only, and equal brand new; what offers?—49, High St., Saffron Walden, Essex. Phone 45. [X3265]

DOUGLAS, 1914, 25h.p., 2-speed, tyres unpunctured, lamps, horn, long exhaust, latest Amac, fast, excellent condition; 50 gns.; exchange, with cash, modern combination—Dickinson, 1, Lansdowne Place, W.C.1. [3747]

IT Appears Ridiculous to Advertise when you have no stock, but we are giving deliveries to the early birds. Place your order at once if you want delivery—Eli Clark, Douglas Agent, 196, Cheltenham Rd., Bristol. [0966]

4hp. Douglas Combination, 1917, 3-speed, kick starter, not W.D. model, fully equipped, speedometer, etc., new condition throughout; what offers over £115?—25h.p. Douglas part.—Albert, 1, Church St., Kingston, S.W. [3808]

DOUGLAS 25h.p., about 1911, back tyre wants re-weaving, engine wants retiming, guaranteed complete and mechanically sound; no spares required; not ridden for 5 years; bargain, £18.—101, Springbank Rd., Hither Green, London. [3930]

1918 Douglas 4hp. Combination, 3-speed, kick start, coachbuilt sidecar, screen, hood, apron, 3 lamps, tools, and spares, lovely condition; first M.O. £90 secures; seen by appointment—Gillette, Abbey Hotel, Westminster Bridge Rd., S.E. [3440]

23h.p. Douglas.—We are not at present accepting further orders until such a time as we can obtain a sufficient number of 25h.p. Douglas machines. We shall still be pleased to send illustrations and information likely to help our many customers.

4hp. Douglas Combinations.—We are not at present accepting further orders until such a time as we can obtain a sufficient number of these outfits. We shall still be pleased to send illustrations and information likely to help our many customers.—Robinson's Garage, Green St., Cambridge. T.A. Bicycles. Tel. 388 Cambridge. [4014]

DOUGLAS, 1919, 4h.p., with coachbuilt sidecar and wind screen, purchased last March, mileage about 700, in perfect condition, very smart appearance, about £4 worth spare parts for touring, two lamps (unused), horn; trial with owner in Warwick after 14th June; £120, no offers.—Lt.-Col. Taylor, The Nortgate, Warwick. [X3369]

Enfield.

1916 6hp. Enfield Combination; £115.—29, Leonard's St., Bromley-by-Bow. [3431]

ENFIELD 25h.p. 2-stroke, 1916, new condition; £48.—Melrose, 1, Kenlor Rd., Tooting. [3814]

1914 Enfield 6hp. and Sidecar, in perfect order; £100.—Normand Cycles Co., Maidhead. [3906]

ENFIELD 1915 6hp. Combination, new condition; £125.—34, Bingham Rd., Bournemouth. [X3234]

1917 8hp. Enfield Combination, in new condition; lowest £135.—Manor House, Nanner, Frome. [3980]

ENFIELD Twin Lightweight, 2-speed gear; 38 gns.—Geo. Smith, Motor Cycle Depot, Clapham Junction. [4011]

1911 Royal Enfield, 2½h.p., in perfect condition, tyres new; £24.—Viggers, North Bar Dairy, Banbury. [X3204a]

6hp. Royal Enfield C.B. Combination, as new; £98; evenings after 6.—Tuckett, 12, Watery Lane, Meriton Park. [3677]

1914 6hp. Enfield Combination, good condition; £90; seen after 6.—119, Benares Rd., Plumstead, S.E. [3887]

ENFIELD, 2½h.p., 2-speed, accessories, lamps, good condition; £28.—45, Godolphin Rd., Shepherd's Bush, W.12. [3717]

6hp. Enfield (1913) and Coachbuilt Sidecar; no reasonable offer refused.—Write, Mullar, 34, Kennet Side, Reading. [3926]

JONES' Garage, special agents for Enfields, Broadway, Muswell Hill, N.10, and Woodside Parade, North Finchley. [2920]

ENFIELD 2-stroke 2-speed, as new, ridden 300 miles only, fine little 'bus; 45 gns.—Mason, 130, Hill Lane, Southampton. [3932]

ENFIELD 3hp. Twin, 1915, good condition, new tyres, lamps, etc.; £50.—43, Stock Orchard Crescent, N.7. (After 7.) [3963]

ENFIELD Lightweight, 3hp., 2 speeds, clutch, tyres new, machine perfect; £42.—53, Russell Rd., St. Ann's Rd., Tottenham. [3492]

ENFIELD Twin, 2½h.p., 1912, Bosch, excellent running order; £30, or exchange good 2-stroke.—Box L1,998, c/o The Motor Cycle. [3648]

1919 3hp. Enfield, scarcely used, driven 50 miles only.—Hardie, 24, Woodstock St., Off Oxford St., W.1. Phone: Mayfair 6559. [3571]

3hp. Enfield 2-speed Model, about 1914 or 1915, twin cyl. engine; 60 gns., includes accessories.—Wagchops, 9, Shoe Lane, London. [3942]

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MOTOR CYCLES FOR SALE.

Enfield.

ENFIELD 25h.p., 1912, 2-speed, free engine, chain drive, good condition; £37, lowest.—37, Daleham Mews, Belsize Lane, Hampstead, N.W. [3992]

1919 (March) Enfield 6h.p. Combination, done 900 miles, perfect, ready for road; £160; seen City.—Barnes, Bartholomew's Hospital, E.C. [3838]

6h.p. 1916 Enfield Combination, excellent condition; £105; less power combination in exchange entertained.—Thomas, Jeweller, Gorseioun, Glam. [X3629]

1915 3h.p. Twin Enfield, 2-speed, in new condition, London-Eastbourne top gear; 55 gns., or offers; after 6 p.m.—Rosemary, Tram Terminus, Ditton, Surrey. [3931]

ENFIELD, 1916, 2½h.p., 2-speed, Dixie Amac, new tyres, Miller's lamps, horn, splendid condition; £43.—The Homestead, Hendon Lane, Finchley. [3723]

1916 6h.p. Enfield Combination, excellent condition, mileage 2,000, fully equipped with lamps and wind screen; 120 gns.—Heading, 197, Banbury Rd., Oxford. [X3672]

ENFIELD 6h.p. Combination, 1915, lamps, horn, speedometer, etc., perfect condition guaranteed; 120 gns., offers. Phone Brixton 698.—1790, The Grove, Denmark Hill. [3671]

ENFIELD, 3h.p., 1914 model, 2-speed gear, lamps, 2 generators, tools, etc., tyres and machine in excellent condition; price 47 gns.—Capt. Tees, Seaplane Station, Lee-on-Solent. [3549]

23h.p. Enfield, splendid order, accessories; £60.—24 Hardie, 24, Woodstock St., Off Oxford St., W.1. Phone: Mayfair 6559. [3547]

ENFIELD 6h.p. Coachbuilt Combination, just been overhauled, perfect condition, little used; £110, or nearest offer.—W. Goodwin, 102, Friar Gate, Derby. [X3509]

1917 8h.p. Enfield Combination, excellent condition, 3 lamps, horn, speedometer, mileage under 3,000; any trial; £146.—130, Dudwell Lane, Halifax. [3913]

1915 6h.p. Enfield Coachbuilt Combination, lamp, horn, speedometer, and all accessories; £120 or best offer.—1, Hillside, Stonebridge Park, Harlesden, N.W.10. [3699]

1914 6hp. Enfield and C.B. Sidecar, lamps, horn, zigzag grid, etc., very good condition throughout, overhauled and enamelled; 100 gns.—Burrell, Kirk Deighton, Wetherby, Yorks. [3472]

ROYAL Enfield, 1917, 3h.p. twin, 2-speed, kick starter, new tyres, fine condition; 60 gns., or exchange with cash for combination; no dealers.—1, Mayow Rd., Forest Hill S.E. [3427]

24h.p. Enfield 2-stroke, 1917, 2-speed, complete with lamps, horn, and tools, etc., splendid condition, can get 45 m.p.h.; 48 gns.—Lieut. Clarke, Emmanuel College, Cambridge. [X3364]

ENFIELD 2½h.p. 1913 Twin, 2 speeds, recently overhauled, good condition; 35 gns.; consider good combination exchange, cash adjustment.—Crow, William's Farm, Stebbing, Chelmsford. [3348]

ENFIELD 3h.p., 1919, 2-speed, with mechanical horn, and rear lamp, ridden about 500 miles; price £75; "Motor Cycle" deposit system.—Replies addressed Box L2,037, c/o The Motor Cycle. [4032]

LOOK at this.—3hp. late model Enfield, 2-speed, K.S., complete set lamps, and horn, perfect condition throughout, good tyres, etc.; will accept £50 for quick sale.—11, Higher Albert St., Chesterfield. [3353]

BEST Bargain This Week.—Enfield twin, 3h.p., 2 speeds, kick start, complete with lamps and horn, only done 500 miles, condition equal to new, first cheque for £55 secures.—Apply, 11, Madin St., Chesterfield. [3354]

1916 6hp. Enfield Combination, in capital order, mileage 6,000, average 70 m.p.g., new Kempshall oversize tyres, horn, speedometer, and spares; any trial; offers over £120.—Moorthouse, Joiner, Maltham, Huddersfield. [X3553]

ENFIELD Brand New (Nov., 1917) 3h.p. Twin, 2 speeds, kick starter, Lucas lamp sets, mechanical horn, guaranteed not been 200 miles, been stored, equal to brand new; £75.—49, High St., Saffron Walden, Essex. Phone 45. [X3263]

6hp. 1914 Enfield Coachbuilt Combination, engine in lovely condition, new tyres, complete with speedometer, horn, lamps, tools, spares; £85, or part exchange good Douglas or Enfield 2½h.p.—Jackson, Jeweller, Fleet, Hants. [3904]

Excelsior.

AMERICAN Excelsior Combination, electrically lit, equipped; £95.—Melrose, 1, Kenlor Rd., Tooting. [3815]

6h.p. British Excelsior, 3-speed, countershaft, clutch, coachbuilt sidecar, in good condition; what offers?—Lovell, Henstridge, Somerset. [3727]

BRITISH Excelsior, 1915, 5-h.p., 3-speed countershaft, K.S., C.B. sidecar; seen any time; trial.—S. Savage, 4, Darnier Rd., Tonbridge, Kent. [3766]

LANCASHIRE, Cheshire, North Wales, Isle of Man.—Buyers order now from official American Excelsior dealers, J. Blake and Co., Liverpool and Manchester. [3656]

BRITISH Excelsior Combination, 4½h.p., 3-speed countershaft gears, clutch, kick starter, Millford coachbuilt sidecar; 78 gns., or offer; would separate.—King, Egrove Farm, Oxford. [X3614]

MOTOR CYCLES FOR SALE.

Fafnir

FAFNIR 3½ h.p. Combination, 2-speed, good appearance; £30; after 6 p.m.—24, Townley Rd., East Dulwich. [3881]

F.N.

F.N. 4-cyl. Bosch mag., shaft drive, good condition; inspection invited; £34.—Ranton, School House, Tunley, near Matlock. [X3714]

F.N. 4-cyl. 5-6 h.p., in running order, fixed gear. Bosch mag., a.v.v. B.B. carburettor; bargain; £28.—Box L1,968, c/o The Motor Cycle. [3515]

F.N. 1913, dropped frame, new tyres, footboards, complete less engine (four cylinder); £12.—8, Luford St., Rotherhithe, London, S.E.16. [X3381]

F.N. 4-cyl. drop frame, torpedo tank, enamelled all red, P. and H. lamp set, horn, new Dunlop, spotting machine; £25, or best offer.—18, Maygrove Rd., Broudesbury (opposite Kilburn Met. Station). [3429]

F.N. 1914 5-6 h.p. Combination, shaft drive, 2-speed gear, clutch, Bosch mag., 2 brakes, cone torpedo sidecar, carrier, lamps, horn, new tubes and tyres, many spares, perfect condition; £80.—R., Heath Croft, Dartford. [3253]

F.N. 5-6 h.p., 2-speed, clutch, Bosch, shaft drive, mechanical condition good, also enamel, tubes and tyres, less carburettor; machine sound throughout, but needs minor replacements; £20.—W.A., 32, Somerby Rd., Barking. [3759]

F.N. 1914, 4-cyl. 8 h.p., 3-speed, clutch, Phoenix economy C.B. sidecar, screen, speedometer, electric lighting and horn, accessories, new tyres, stored during restrictions, excellent condition; trial.—Jordan, Chemist, Grays, Essex. [3767]

F.N. 4-cyl. clutch, single gear, new cylinders, valves, piston rings, 2-lever F.N. carburettor, dropped frame, new tapered tank, knee-grips, new aluminium footboards, T.T. bars, Pedley grips, good tyres, Smith speedometer, enamelled dark green, perfect condition in every part, with tools and spares; £39; ready to ride; first cheque secures.—Bernard, Jacques Court, Elham, Canterbury. [3645]

Harley-Davidson.

HARLEY-DAVIDSON Combination, 1915, very little used.—66, Horley Rd., Cufford. [3991]

1914 Harley-Davidson 7-9 h.p. Combination, splendid condition; £125; trial.—The Moat, St. Mary, near Rochester. [X3368]

HARLEY-DAVIDSON Electric Model, 1915, with tradesman's car, perfect condition; £110.—24, Orion Rd., Weymouth. [3916]

HARLEY-DAVIDSON, 1915, solo speed model, short wheelbase, not ridden for past 2 years, perfect condition; £85.—Bloom, Forcett, Salisbury. [X3243]

1915-16 Harley-Davidson Combination, speedometer, lamps, horn, etc., fast and powerful; £125.—Spence, 18, Broughton Rd., Stoke Newington, N.16. [X3477]

1915-16 Harley-Davidson Combination, magneto model, concealed sidecar chassis, exceptional condition; £112.—50, Pemderon Rd., W. Croydon. [3724]

HARLEY-DAVIDSON, 1915, electric lighting, sidecar holding 2 persons, all in absolutely new condition; highest bid; seen in London.—Champeress, Ardnam, Argyll. [3207]

1916 Harley-Davidson 7-9 h.p. Combination, electric model, little used, stored 2 years, splendid condition, spare tyre; £140.—Bates, 3, West End St., Stapleford, Notts. [X3349]

HARLEY-DAVIDSON Combination, 1915, 3-speed, engine No. 7929K, hood, wind screen, good condition, inspection invited; £120.—Bookellers, 14, George St., Croydon. [3810]

HARLEY-DAVIDSON Combination, 2-seater sidecar, 1916 model, 3 speeds, mag., faultless condition; £140, no offers.—T. Beaches, 20, Church St., Newcut, Gloucester. [X3631]

1915 Electric Harley-Davidson, stored 2½ years, perfect, 4-point Camolett sidecar, apron, tyres and tubes, nearly new spare cover and tube, etc.; £115.—43, Stafford Rd., Warrington. [X3552]

HARLEY-DAVIDSON, 1918, 7-9 h.p., 3-speed, countershaft, kick start, in lovely condition, very smart, tyres new, magneto ignition; £130, no offers.—C. Hurlock, 63, Denmark Hill, S.E.5. [3798]

HARLEY-DAVIDSON 7-9 h.p. Combination, late 1915, speedometer, lamps, horn, etc., brand new sidecar with locker, 2 spare chains, practically new tyres, in perfect running order, fast and powerful; 120 gns., no offers.—Robson, Dale Rd., Matlock. [X3715]

HARLEY-DAVIDSON 4½ h.p., single-cyl., 1915-16 model, 2-speed gear, recently overhauled by Harley-Davidson at a cost of £35, in tip-top condition, very fast, been stored 2 years, lamps, mechanical horn, new spare tyre, chain, all accessories; £85, no offers; can be seen at Newmarket by appointment.—Colewick, Lambrook, Newmarket. [3086]

Hazlewood.

1916 6 h.p. Hazlewood, 3-speed countershaft and clutch, Mills-Fulford sidecar, lamp, horn, speedometer, first-class condition; seen only by appointment; best offer over £110.—H. Bagott, 48, Broad St., Oxford. [X3522]

1914 2½ h.p. Hazlewood, new 3-speed Armstrong hub, pedal starter free engine, J.A.P. engine, new tyres, splendid condition, ready ride away; what offers? Owner bought combination.—Box L1,981, c/o The Motor Cycle. [3560]

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MOTOR CYCLES FOR SALE.

Henderson.

HENDERSON 4-cyl. 10 h.p. and Millford Empress sidecar, excellent condition; £95.—Houlberg, 45, Bangalore St., Putney, S.W.15. [3731]

HENDERSON 4-cyl. 8-10 h.p., 1914, clutch, kick start, in splendid condition, with all accessories, Miller head lamp and generator, rear lamp, tyres 28 in. x 3 in., perfect, horn, speedometer, watch, Montgomery coachbuilt sidecar, new upholstery, folding dash, folding screen, hood, luggage rack and petrol carriers, step, electric light inside, side lamp and electric horn, new accumulator, all tools, pump, etc.; seen any evening 6.30; £130.—James, 3, Carlton Mansions, 37, Anson Rd., Tufnell Park. [3514]

Hercules.

2½ h.p. Hercules, 2-stroke, 2-speed Albion gear, plating and enamel as new, Dunlop tyres, good condition throughout; £30.—F. Darby, Ely Rd., Sutton, Ely, Cambs. [X3516]

Hobart.

HOBART 1915 2½ h.p. Two-stroke, only shop soiled; £50, or best offer; real bargain.—T. M. Pearce, Bishop's Castle. [X3199]

HOBART 2½ h.p., 3-speed and clutch, open frame, splendid running order; bargain, 37 gns., no offers.—27, Longsight Rd., Harwood, near Bolton. [X3215]

Hockley.

2½ h.p. Hockley T.T. 2-stroke, 2 speeds, never used; £45.—Spink, 52, Brodric Rd., Wandsworth Common, S.W. [3793]

Humber.

2 h.p. Humber, fine condition, full equipment; £30.—Twort, Hurstwood, Camberley. [3601]

HUMBER 3½ h.p., mag., perfect; bargain; £25; after 6.—54, Hergate St., Waltham Rd., S.E. [3967]

HUMBER Lightweight, 2 h.p., in splendid condition.—Clayphan, Laughton, Gainsborough. [X3604]

T.T. Humber 2½ h.p. Twin, 3-speed, clutch, lamps, etc.; £42.—Payne, Mary Knoll, Ludlow. [X3246]

LIGHTWEIGHT Humber, new tyre, belt, splendid running order; £20.—16, York St., Dover. [3856]

2½ h.p. Humber, Bosch, B. and B., spare belt, good tyres; £25; good running order.—13, Irland Av., Eccles. [3510]

HUMBER Combination, detachable solo, new Dunlop and belt; £35.—Heskett, Donnington, Chichester. [X3767]

1915 Humber, 3½ h.p., 2-speed, handle start, like new, special bargain, £35.—29, St. Leonard's St., Bromley-by-Bow. [3822]

HUMBER 3½ h.p., B. and B., Simms, ride away; £25; any time after 6 p.m.—S.W., 14, Elphinstone Rd., Wines Av., Walthamstow. [3625]

HUMBER 3½ h.p., 2 speeds, handle start, Bosch mag., good tyres, recently overhauled; what offers?—R. Fare, High St., Cullumpton, Devon. [3929]

HUMBER (1914) 2½ h.p. Twin, 3 speeds, clutch, fully equipped, splendid condition; £48.—Forward, 33, Chalk Hill, Bushey, Watford, Herts. [3410]

HUMBER 1914 3½ h.p., 2-speed, free engine, complete with lamps, etc., excellent condition; £35.—R. Reeves, Olinda, Roft St., Oswestry. [X3626]

1915 4 h.p. Humber Combination, water cooled, 3-speeds, perfect condition, as new; 95 gns.; after 5.30.—101, Pattison Rd., Plumstead. [3390]

HUMBER Lightweight, practically new tyres, ride away; £25.—After 6.30 p.m. or Saturday afternoon, Leverett, 175, Brookmill Rd., Deptford. [3687]

HUMBER, 3½ h.p., Bosch, B.B. carburettor, 2-speed hub, adjustable pulley; £40; seen any time.—Marples, Oak Kennels, Hazel Grove, Cheshire. [X3229]

3½ h.p. 3-speed Humber, perfect condition throughout, Lucas head lamp set, horn, etc., with sidecar, complete; £57/10.—Batten Bros., Cullumpton. [3685]

HUMBER Lightweight, 1914, 2 h.p., perfect running order, any trial, enamel and plating as new; bargain, £25, no offers.—Allen, Barnwell, Peterboro'. [X3374]

4 h.p. Humber, smart sidecar, upholstered in blue, 3 speeds, clutch, new Dunlops, handle start; first cheque £55 secures.—Bacon, 41, Montpelier St., Brighton. [X3710a]

HUMBER, 3½ h.p., single speed, good condition, good going order, horn, new Dunlops, Bosch; £27, or nearest first cash secures.—Riley, The Dairy, Wotton, Ashbourne. [3794]

1914-15 3½ h.p. Humber Combination, 3-speed, etc., superior roomy underslung coachbuilt sidecar, whole quite new condition; £75.—Write, C.C.F., 2, Madeira Park, Toorbridge Wells. [3878]

COMBINATION Humber 4 h.p., 3-speed, free engine, late 1915 model, torpedo sidecar, fitted with lamps, new tyres, spare new belt, in excellent condition, nearly new; £95.—E. R. Hoyle, 10, Duke St., Reading. [3600]

HUMBER, 1915, 3½ h.p., 3-speed, S.A. hub gear (for 8 h.p.), clutch, and K.S. light wicker sidecar with side door, will take passenger anywhere; £48; after 4.30.—Carpenter, 13, Bervan Rd., Plumstead. [3377]

3 h.p. Humber, 2-speed, handle start, excellent condition and appearance, Mills-Fulford wicker sidecar, new Palmer tyres, spare tyre, tube, tools, lamps, belt, carefully stored 2 years, private owner; nearest £50.—Box L1,877, c/o The Motor Cycle. [3456]

MOTOR CYCLES FOR SALE.

Matchless.

MATCHLESS-J.A.P. 8-10h.p. Racer, o.h.v., new Amac, 14in. Dunlop belt, Brooks saddle, and drop handle-bars just been fitted, re-enamelled red, very fast and sporty, in tip-top condition; £52/10.—23, Otterburn St., Tooting, S.W. [X3357]

MATCHLESS Victory J.A.P. Combination, very smart, in perfect condition, specially enamelled maroon, Lucas lamps and horn, Tan-Sad, 4 interchangeable wheels, small mileage; 150 gns.—Wainwright, Millfields, Wolverhampton. [X3699]

3½ 4h.p. Matchless, speedometer, lamps, horn, etc., practically new condition, £65; also 3½ 4h.p. Matchless 3-speed sidecar model, excellent condition, £85; exchanges considered.—The Model Mart, 14, Conway Rd., Plumstead, London. [X3596]

MATCHLESS New Model H, spring frame, 8h.p. Jap engine. Write at once and book for earliest delivery. Lucas dynamo outfit at option, 5% on your deposit. Decide now and order the best combination.—J. Tassell, 1a Bloomfield Rd., Plumstead. [X7704]

Metro.

METRO-TYLER—Sole agents for Hertfordshire, Chandler, Reye and Williams, Suo St. Hitchin. [X998]

1919 Metro-Tyler, 2-speed, horn, mud shield, etc., 45 m.p.h., used fortnight only; cost over £60, offers.—Robins, Wonston Manor, Sutton Scotney, Hants. [X3840]

1919 Metro-Tyler 2½h.p., 2-speed 2-stroke, disc wheels, long exhaust, footboards, only delivered this week and unused; owner having bought car cannot accommodate both; £64/10, first cash gets it.—Box 4, 112, c/o The Motor Cycle. [X3612]

Minerva

MINERVA, 3½h.p., waterproof mag., B.B., T.T. drop frame, £50; sidecar, £7/10.—50, Vernon Terrace, Long Lane, E. Finchley. [X3558]

Moto-Reve

MOTO-REVE, 2½h.p., mag., long exhaust, ride away; £25, offers.—Brown, Beechcroft, Devizes. [X3347]

2½ h.p. Moto-Reve, Bosch, plating, enamelling, and 4 tyres perfect; trial; £21 cash.—Pledger, Shipdham, Norfolk. [X3651]

MOTO-REVE, spring forks, splendid condition, magneto, just overhauled, wants timing; bargain, £16.—Jones, Carlton, Beds. [X3558]

Motosacoche.

MOTOSACOCHE Lightweight for sale; £17; running order, seen by appointment.—Hutton, Eastcote, Leatherhead. [X3117]

MOTOSACOCHE Lightweight, magneto, spring forks, X1 all saddle.—Apply, Rolls, Hillington, Maybury, Woking. [X3776]

MOTOSACOCHE 2½h.p., variable gear, enclosed Bosch, Druid forks, automatic and hand lubrication, Dunlop belt, original enamel and plating, good tyres, genuine machine, in perfect condition; £23.—73, Oakhurst Grove, East Dulwich, S.E. [X3673]

New Hudson.

NEW Hudson 2½h.p., 2-stroke, good running order and condition; seen any time.—Newbold, Diss. [X3597]

NEW HUDSON 4h.p., 3-speed, clutch, 1915, new condition; £65.—32, Mount Rd., Hendon, N.W. [X3895]

NEW Hudson 6h.p. Combination, countershaft gear, in splendid order; £130.—Turpin's, 29, Preston Rd., Brighton. [X3315]

NEW Hudson, 2½h.p., 2-stroke, 2-speed countershaft, 1918, full accessories, as new; 47 gns.—36, David Lane, Shadwell, E. [X3749]

NEW Hudson 1915 3½ 4h.p. Coachbuilt Combination, 3 speeds, lamps, ride away; £78.—Matthews, 14, St. George's Rd., Stafford. [X3611]

NEW Hudson Machine, 3 speeds, K.S., clutch, 1914, lamps, K.S. horn.—Apply, 55, Russell Rd., St. Ann's Rd., Tottenham. [X3494]

NEW Hudson, 2½h.p. J.A.P., 3-speed, clutch rod missing, fine running order; £35, or offers.—Powell, 62, Marefair, Northampton. [X3535]

2½ h.p. New Hudson J.A.P., 3-speed, clutch, Bosch, 4 B. and B. Dunlops, overhauled, fast; £41; ride away.—187, Anerley Rd., Anerley, S.E. [X3712]

1914 New Hudson C.B. Combination, chain-cum-belt, 3-speed, clutch, lamps, etc., in splendid condition; £80.—261, Mitcham Lane, Streatham. [X3764]

NEW Hudson Big 6h.p. Combination, 1914, 3-speed, kick start, in perfect running order; any trial; £97/10.—Rowe, 89, Well Hall Rd., Eltham, S.E.9. [X3340]

NEW Hudson 2½h.p., 1915, 2-stroke, stored 3 years, lamps, horn, etc., splendid condition; what offers over 40 gns.—Payne, Foxham, Chippenham, Wilts. [X3575]

NEW Hudson Motor Cycle, with Armstrong 3-speed, 2½h.p. J.A.P. engine, in good order; will accept £45 for quick sale.—Seen and tried at 28, Orchard St., Yeovil. [X3515]

1915 New Hudson, De Luxe Model, 2½h.p., 2-stroke, 2-speed, X1-All saddle, Lucas accessories, Dunlops, excellent order; best offer over £40.—38, South St., Rugby. [X3657]

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MOTOR CYCLES FOR SALE.

New Hudson.

1914 4h.p. New Hudson, 3-speed, hub gear, free engine, Bosch mag., wicker sidecar, engine recently overhauled, ready ride away; £55.—33, Promenade, Cheltenham. [X3245]

1914 6h.p. New Hudson and Fulford Cane Sidecar, 4 point, Armstrong 3-speed, clutch, kick starter new gears, waterproof Bosch, been overhauled and all in first-class condition; £60.—Pannell, Guildford House, Pembroke. [X3238]

New Imperial.

NEW Imperial 2½h.p., in good order.—Tonge, Holmesfield, Sheffield. [X3344]

NEW Imperial.—Caffyns, Ltd., Eastbourne, are booking orders for delivery shortly. [X0018]

NEW Imperial 2½h.p., 1916, 2 speeds, wide bars, fast; £50.—Railway Garage, Staines, New. [X4004]

1919 New Imperial 2½h.p., condition as new; what offers over £53.—Lt. Shaw, Seaplane Base, Westgate, Kent. [X3741]

NEW Imperial Combination, 8h.p., 1919, fully equipped, mileage 1,500; what offers?—20, Redlam, Blackburn. [X3636]

NEW Imperial-Jap, 2½h.p., 2 speeds, free engine, very fast; first cheque £43 secures.—Fisou, St. John St., Salisbury. [X3488]

NEW Imperial, 2½h.p., about 1916, 2 speeds, low mileage, rebushed, fine condition; £37.—10, Aldenham Rd., Bushey. [X3850]

NEW Imperial-Jap, 1916, 2-speed clutch, Klaxon, excellent condition; 40 gns.—Sutton, 3, Clarion St., Stockton Heath, Warrington. [X3216]

NEW IMPERIALS. Call and inspect the latest models.—Sole London agents, Rey's, 173, Great Portland St. Phone: Mayfair 379. [X9677]

NEW Imperial, 1915, 2½h.p., 2-speed, perfect running order; £45; also wicker sidecar, side door; £5.—Begelly Arms Cottage, Begelly. [X3329]

NEW Imperials, 1919, solo and combinations. Deliveries commence shortly. Book up now.—George Smith's Motor Cycle Depot, Clapham Junction. Phone: Battersea 1271. [X3035]

NEW Imperial 2½h.p., complete with 2 lamps, tools, accessories, Palmer tyres and Klaxon, in perfect condition; 50 gns., no offers.—Address, Imperial, c/o Pools, 180, Fleet St., E.C. [X3452]

NEW Imperial, 2½h.p. J.A.P., magneto, adjustable pulley, Druids, 3 speeds, clutch, new tyres, tubes, belt, take you anywhere; trial; £40.—16, St. Winifred's Rd., Teddington. [X3834]

1919 New Imperial, 8h.p., just delivered, 3-speed, kick start, Canoelet coach sidecar, lamps, and horn, a powerful combination, silent running; £155, or offer.—Box L2,034, c/o The Motor Cycle. [X4029]

NEW IMPERIAL-J.A.P., 2½h.p., 2-speed, countershaft, Dunlop tyres and belt, front and rear lamp set, horn, appearance and condition equal to new, thorough inspection and trial, £55; after 6—64, Raynham Rd., Edmonton. [X3566]

LATEST Model 1919 8h.p. New Imperial-Jap Motor Cycle, 6 weeks old, 23x3in. tyres, large P. and H. lamp sets, horn and tools; £120; will buy or exchange late I.O.M. Rudge Multi, Brough, Douglas, or similar.—43, Grove Rd., Sparkhill, Birmingham. [X3438]

New Ryder

NEW Ryder, 2½h.p., 2-speed, excellent condition, little used; £40.—Nobbs, Beech Villa, Priory Rd., Hornsey. [X3420]

NEW Ryder, 2-speed, brand new 1919 model, just received from makers; £65.—Stevens, 184, Pentonville Rd., King's Cross. [X3581]

Norton.

JACK HEALY, Cork.—Norton official agent for the South of Ireland. [X6335]

CROW Bros., High St., Guildford, Norton agents: let us reserve you one. [X5301]

BROOK Bros., Burnham, Som., are sole agents for Norton; early delivery assured. [X1698]

NORTON, T.T., Philipson and clutch, splendid condition; £55; also light wicker sidecar for same. £5.—37, Meath Rd., Ilford. [X3833]

DAN BRADBURY, 224, London Rd., Sheffield, the well-known Norton exponent and agent, will give you earliest possible delivery of Nortons. [X7269]

1916 Norton Big Four Combination, just overhauled, lamps, hood, screen, etc.; any trial by appointment; £130, no offers.—Box L1,969, c/o The Motor Cycle. [X3516]

NORTONS—We are now booking orders for the latest model Norton solo and sidecar outfits; £5 deposit; deliveries in strictest rotation.—Maudes', 100, Gt. Portland St., London, W.1. [X5675]

1915 Norton B.S., h.c. Philipson, engine rebushed throughout, C.A.V., new armature, B.B. variable, machine re-enamelled Zenith red. The above work just completed; magnificent machine; cash, £65.—Bushey View, Sandy Lane, Hampton Wick. [X3704]

3½ h.p. T.T. Norton, believed 1915 or 1916, in excellent order, tyres as new, re-enamelled, engine overhauled and rebushed, long exhaust, P. and H. headlight, Gloriflaph horn, mirror, P.P. grips, new belt, very fast, a sound machine; seen any time; £65 no offers.—Brown, Jun., Hotel, Eton, Staffs. [X3340]

MOTOR CYCLES FOR SALE.

Norton.

NORTON Big Four, Chuter-Lea frame, P. and M. 2-speed gear, tank capacity 2½ galls. petrol, 1½ gall. oil, in perfect mechanical order, Mills-Fulford best wicker capacious sidecar, all car wheels, tyres good, new 700 cc Palmer Cord on sidecar; first cheque £70 secures, no offers; would drive to purchaser on payment of reasonable expenses.—Victor Schofield, Drakes Broughton, Peishore, Worestershire. [X2598]

N.S.U.

N.S.U. motor cycle; £15.—J. Todd, Summerbridge, Harrogate [3481]

3 h.p. N.S.U. Motor Cycle; bargain, £15, first cheque secures.—29, High St., Ruxhall, Kent. [3985]

3 h.p. N.S.U., in splendid order, short of magneto; first £10 secures.—170, Red Lane, Coventry. [X3762]

3½ h.p. N.S.U., wicker sidecar, 2 speeds, splendid mechanical condition, takes two anywhere; £30.—Below.

N.S.U. 6 h.p. Twin Combination, 2 speeds, K.S., all in good condition; bargain, £45.—27, Peldon Ave., Richmond. [4036]

N.S.U. 3½ h.p., mechanical valves, 2-speed, free, mag., good order; first £15 only.—Johnson, 258, Spring Rd., Ipswich. [3903]

N.S.U. Twin, 3½ h.p., 2-speed gear, and splendid C.B. sidecar; £39.—16, St. Mary Abbott's Terrace, Kensington. [3849]

N.S.U. 3 h.p., Bosch mag., B. and B., new Dunlop on back, in running order; £20.—Vernon Smith, 20, Preston, Wellington, Sidop. [X3593]

N.S.U. 3½ h.p., 2-speed, free engine, just overhauled, splendid condition; £28.—113, Mayfield Rd., Sanderstead, Croydon S.E. [3875]

N.S.U. Combination, coachbuilt, 2 speeds, spring frame, horn, etc., ready for road; sacrifice £46, or will separate; after 5.30 p.m.—37, High St., Eltham. [3541]

N.S.U. 3½ h.p., splendid condition, Bosch, Senspray, tyres good, appearance as new; £43, or near offer; apply after 7.—55, Holland Rd., Harlesden, N.W.10. [3710]

N.S.U. 6 h.p., Bosch mag., 2-speed, free engine, complete with wicker sidecar, horn, lamps, spares, etc., in good running condition; £60, or near offer.—Swines, Westwood, Crediton. [X3628]

6 h.p. Twin-cyl. N.S.U., coachbuilt Phoenix sidecar, nearly new, 2-speed, kick start, fully equipped; price £68.—Speckley, 1, Gunnersbury Lane, Acton Hill, London, W.3. [3971]

MOTOR CYCLE, N.S.U. 4 h.p. two, Bosch mag., Draid spring forks, splendid tyres and tubes, plating as new, good running order; must sell; first £20 secures.—Thickett, 6, The Arcade, Newark, Notts. [X3643]

N.S.U. 7 h.p. Combination, spring frame, 3-speed clutch, Millford coachbuilt sidecar, hood and screen, Klaxon, Stewart speedometer, electric lighting, splendid condition; any trial; £100; after 6.—1a, Larkhall Lane, Clapham. [3772]

N.S.U. 1914 Combination, 3½ h.p., F.E., 2 speeds, Senspray carburettor, Bosch magneto, nice coachbuilt sidecar, Orto folding wind screen, storm apron, lamps, horn, two new tyres, tools, excellent condition; cash, £60.—62, Derby Rd., Ponders End, Middlesex. [3619]

N.U.T.

N.U.T., 1916, T.T., overhead valves, engine perfect, condition, enamelling, and plating excellent; tyres good; £76.—Duke, Jun., Dawson's, 60, Regent St., Sheffield. [X3776]

O.K.

O.K., 2-speed, cylinder rebored, new piston, splendid running order; £38.—379, Cambridge Rd., Bethnal Green, E.2. [3576]

JONES Garage, special agents for O.K. machines, Broadway, Muswell Hill, N.10, and Woodside Parade, North Finchley. [2922]

O.K., 2½ h.p., 1916, 2-speed, countershaft, lamps, horn, semi T.T. bars, in good condition; £45.—224 High St., Plumstead. [3606]

1918 O.K., good condition; £50; complete with accessories, or part exchange for 4 h.p. or more.—J. Arthur, 2a, High Street, Dorking. [3379]

O.K. Junior, 2 speeds, countershaft gear, aluminium footboards, fast and powerful; bargain, price £32.—Rogers, 50, St. John St., Whithorn, Wigtownshire. [X3371]

Omega.

OMEGA J.A.P., the king of lightweight motor cycles, 2½ h.p., 2-speed, 54 gns. We can deliver these famous machines now. Send for specifications.—Sole district agents, C.M.D. Motor Cycle Garage, 5, Tavistock St., Lenington Spa. [X2250]

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BRAND New 1919 R.A.F. Model P. and M., just delivered.

LUCAS Lighting Set, Lucas horn, speedometer, spare exhaust valve, sparking plug, and butt-ended tube.

REGISTERED, inland Revenue tax paid, and fully insured.

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Coachbuilt: De Luxe model and bulbous back £9 9 0

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MOTOR CYCLES FOR SALE.

P. and M.

P. and M. Combination, 1914; £85; good condition.—Baker, Swepton, Leicestershire. [3897]

P. AND M., 3 h.p., 2-speed, handle start, very good condition; £37, no offers; owner has car.—Apply, Flemming, 15, Filday Rd., Catford. [3486]

C. BERRY'S 3½ h.p. P. and M. and Coachbuilt Sidecar, 2 speeds and free, countershaft gear; bargain, £48.—125, Canal Rd., Mile End, E. [3698]

P. and M., 1913, excellent order, 2-speed, screen, hood, luggage grid, magneto switch, leg screen; £75.—Rectory, Staple Fitzpaine, Taunton. [3479]

1912 P. and M. 3½ h.p. Motor Cycle, excellent condition, property of naval officer, used on leave; offers.—W. H. Turrall, Torrington, Devon. [3871]

MUST Sell at Once, owner no place to store, P. and M. motor cycle and sidecar, 3½ h.p., 2-speed gear, in excellent running order; willing to sacrifice for £50.—F. E. Vincent, 28, Orchard St., Yeovil. [X3514]

P. and M. and Sidecar, engine overhauled, rebushed, new rings and valve springs fitted, also new tyres, all in perfect order, with lamp, horn, and generator, condition as new; £55/10.—McLoughlin, Rawfolds, Cleckheaton, Yorkshire. [X3663]

Peugeot.

PEUGEOT 6 h.p., perfect order, Grado gear, smart appearance; £45.—King, 1, Cotswold St., West Norwood. [3861]

5 h.p. Peugeot Twin Coachbuilt Combination, 2 speeds, Bosch, Amac, cycle tyres (650x65) new; 45 gns.—After 6 p.m., 5, Collingtree Rd., Sydenham. [4050]

3½ h.p. Twin Peugeot, just overhauled, Simms magneto, B. and B., takes two through hilly Derbyshire easily; first £22 secures.—Buckland, 17, Hawley Rd., Dartford, Kent. [3865]

Precision.

PRECISION, 2½ h.p., 1914, stored 4½ years; £35.—Hill, 21, Marlborough Crescent, Chiswick, W.4. [X3662]

PRECISION 2½ h.p., 2-speed, excellent condition, new tyres and bearings; £30.—6, Arden Grove, Harpenden. [3702]

4 h.p. Water-cooled Precision, 1915, 2-speed, new tyre and belt, lamps, horn, etc.; nearest £44.—Ellis, 59, Hugh Rd., Coventry. [X3761]

GRANDE-PRECISION, 2½ h.p., 1914, 3-speed, clutch, K. start, excellent condition; 40 gns.—36, David Lane, Shadwell, E. [3751]

TYLER-PRECISION 2½ h.p., 2-speed, lamps, etc., good running order; £35, cash.—Goodship, Park Av., London Rd., Ewell, Surrey. [3706]

PRECISION 4½ h.p. Coach Combination, Bosch magneto, 2-speed, in good condition; £58.—12, West Holme, Northumberland Heath, Eritth. [3336]

K YNOCH-PRECISION, 3½ h.p., 2-speed gear, waterproof Bosch, good tyres, etc., repainted, all in first-class condition; £27/10.—Pannell, Guildford House, Pembroke. [X3259]

7-9 h.p. Precision Runabout, solo, 3-wheeler, beautifully constructed, 3-speed gear; clutch, and handle starter; also hood, screen, etc., very fast.—Wauchope's, 9, Shoe Lane, London. [3946]

TYLER-PRECISION, 2 h.p., 1916, 2-speed model, new tyres, excellent condition; any trial after 7 p.m.; £35, or nearest offer before June 21st.—Barrow, Woodcote, Epsom. [3391]

IVY-PRECISION 3½ h.p., 1915, engine overhauled, frame re-canalled and nickelled, equal to any new machine, both in appearance and speed; seen after 7.—84, Hanley Rd., Hoinsey Rd., N.4. [3476]

IVY-PRECISION 4 h.p. T.T. Model de Luxe, Grado Multi gear, good tyres, Bosch, Senspray, long exhaust, almost new, good climber, perfect condition; 60 gns.; after 5 p.m.—8, Leaside Mansions, Muswell Hill, N.10. [3509]

TYLER-PRECISION, 2½ h.p., late 1915, 2-speed, free engine, Senspray, Druids, footboards, drip feed, adjustable pulley, electric lamps, new heavy Dunlops, comfortable, good climber; £40.—34, Keith Grove, Shepherd's Bush. [X3251]

Premier.

PREMIER, 2½ h.p.; £35, or near offer; perfect condition; after 6.—89, Elborough St., Southfields. [3538]

2½ h.p. Premier, accessories, Dunlop tyres, belt, good; £20; ride away.—79, Upton Lane, Forest Gate. [3525]

PREMIER, 3½ h.p., 1914, 3-speed, clutch, sidecar, lamps, nice appearance; £69.—48, Prince George Rd., Dalston. [3665]

3½ h.p. Premier, 2-speed Millennium hub, out of re-2 pair, run in top gear; £25.—Lucas, Berriew, Montgomeryshire. [X3527]

1913 Premier 3½ h.p., 2-speed, engine just overhauled, tyres excellent; £45; any trial.—High Den, Ridgeway, Enfield. [3390]

PREMIER Combination, 3½ h.p., late 1914, 3-speed, clutch, K. start, speedometer, accessories; £58.—36, David Lane, Shadwell, E. [3750]

PREMIER 3½ h.p., 1915, stored 2 years, T.T. engine, clutch, fine condition; £52, or part exchange 2-stroke.—Cook, Jeweller, Newark. [X3237]

MOTOR CYCLES FOR SALE.

Sunbeam.

6 h.p. Sunbeam Combination, engine No. 40939, Bosch, 3 lamp sets, horn, speedometer, 8-day watch, leg shields, 3 speeds, etc., Gloria spring wheel sidecar, luggage rack, petrol can carrier, hood and screen, low mileage, a luxurious, well-kept outfit; £155.—J. S. Howard, Bridge House, Walton, Peterborough. [X3658]

Swift.

SWIFT 2½ h.p., accumulator ignition, all good, ready to ride away; £12.—Speedometer, Corbin-Brown, for 28in. rear wheel, £2; magnet, M.L., clockwise; £5/10.—Goodrich, 11, Market Sq., Dover. [3891]

T.A.C.

8 h.p. T.A.C. C.B. Combination, spring frame, handle starter, countershaft 3-speed, hand clutch; any trial; £70.—97, Mountgrove Rd., Highbury, N. [3424]

8 h.p. 4-cyl. T.A.C., air-cooled, shaft, 3-speed gear box, mechanical inlets, nearly new coach sidecar, spares; £290, or near offer; after 6.30.—91, Ash Rd. Aldershot. [3532]

T.D.C.

T.D.C. de Luxe Model, 2½ h.p., 2-stroke, not run 100 miles, Palmer tyres, lamp set, guaranteed mechanically as new; £35; ride away.—4, Gaywood Rd., Walthamstow. [3708]

Triumph.

TRIUMPH Clutch Model, 3½ h.p., 1912; any trial; £40.—9, Wilson St., Battersea. [4045]

TRIUMPH, 3½ h.p., good running order, lamps, etc.; £28.—14, Palace Grove, Bromley, Kent. [3521]

TRIUMPH, splendid running order, clutch model; £45.—Hodgskin, Totley Rise, Sheffield. [X3587]

1916 4¼ h.p. 3-speed Triumph Combination; £85.—29, St. Leonard's St., Bromley-by-Bow. [3818]

TRIUMPH, 1913, clutch model, first-rate condition, lamps; £47.—2, Newport Rd., Barnes, S.W. [3693]

TRIUMPH 1914, 3-speed, clutch, fine condition; £55.—Gilbey, Bracken Hall, Kesgrave, Ipswich. [3998]

TRIUMPH motor cycle, lamps, horn, etc., 1910 model; £30.—Brecon, Noake, Cheltenham. [X3255]

TRIUMPH 4 h.p. Solo, splendid machine, new tyres, belt; £45, or offer.—45, Castellan Gardens, Barnes. [3977]

TRIUMPH 3½ h.p., 2-speed, free engine; price £40.—can be seen after 6.—9, Sheoley Rd., Camberwell. [X3697]

TRIUMPH 3½ h.p., 1913, clutch, new tyres, belt, and tank, fine condition; £50.—Nichols, Burnham, Son. [3392]

TRIUMPH.—Triumph spare parts supplied by Coventry Motor Mart Ltd., London Rd., Coventry. [X0612]

TRIUMPH, 3½ h.p., good appearance, adjustable pulley; £32/10 cash.—Ashton, Thornhill Edge, Dewsbury. [X3487]

1914 Triumph C.B. 3-speed Combination, lamps, horn, smart lot; £78/10.—261, Mitcham Lane, Streatham. [3762]

TRIUMPH Late 1913 C.B. Combination, done 10,000 miles; £60.—Hill, 21, Marlborough Crescent, Chiswick, W.4. [X3661]

£29.—Free engine Triumph, Bosch mag., B. and B. carburettor.—19, Wilcox Rd., South Lambeth, London, S.W.8. [3688]

JONES' Garage, special agents for Triumphs, Broadway, Maxwell Hill, N.10, and Woodside Parade, North Finchley. [2927]

TRIUMPH 3½ h.p., free engine, 1917, tyres unpunctured; £37/10; letters.—Ellis, Post Office, West Walton, Wisbech. [3920]

TRIUMPH, 1919, 4½ h.p., 3-speed countershaft, with lamps, and horn, ridden 50 miles; £105.—J. Day, West Farleigh, Kent. [X3574]

1919 (May) Triumph Combination, spring wheel sidecar, run 200 miles; best offer.—Write Box 4,120, c/o The Motor Cycle. [X3767]

TRIUMPH Machine, 3½ h.p., condition as new; any trial; not used 3 years.—53, Russell Rd., St. Ann's Rd., Tottenham. [3492]

1913 Triumph, clutch model, just been overhauled, and in excellent running order; £35.—Rush, Hall Farm, near Newmarket. [3471]

4 h.p. Triumph, 1914 model, 3-speed, tyres and belt new, lamps and horn, faultless; £48.—Morrison, John St., Langholm, N.B. [3896]

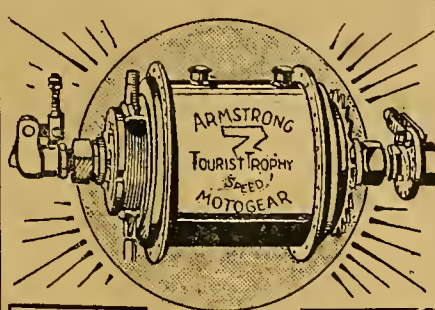
TRIUMPH 3½ h.p., 2-speed, free engine, B. and B., splendid condition; 36 gas.—113, Mayfield Rd., Sandstead, Croydon, S.E. [3976]

3½ h.p. Triumph, free engine, lamps, horn, tyres as 2 new, perfect condition; £40.—Chester, Walnut Cottage, Farningham, Kent. [3622]

TRIUMPH, 1913, 3-speed and clutch, with Gloria wicker sidecar, splendid condition; £55.—67, Silvermere Rd., Catford, S.E.6. [3523]

TRIUMPH, 3½ h.p., 3-speed hub gear, good order; £40, no offers.—Armstrong, Ranelagh Villa, Ranelagh Rd., Wolverhampton. [X3539]

TRIUMPH, 3½ h.p., excellent condition, accessories, and spares, belt, back tyre and tube almost new; £35.—St. Martin's Croft, Epsom. [3997]



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LONDON, W.

MOTOR CYCLES FOR SALE.

Triumph.

1919 Triumph 4 h.p. Combination, countershaft, 3 speed gear clutch, as new; £148; any trial.—Blake, 216, Westbourne Grove, W. [3837]

1913 Free Engine Triumph, mechanically perfect, Lucas lamp set, etc.; any inspection; £46.—Viggers, North Bar Dairy, Babbury. [X3204]

TRIUMPH for Sale, 3½ h.p., Sturmey-Archer 3-speed, J.S. hub, good condition, ride away; £48/10.—54, King Richard St., Coventry. [X3764]

TRIUMPH 3½ h.p., clutch model, in first-class order, College mudshields, lamp and horn, ready for tour; 40 gas.—7, Orchard St., Newport, Wight. [X3580]

TRIUMPH 1913, 3½ h.p., clutch, just overhauled, and reoatored, beautiful condition, been stored; bargain, £48.—37, Eldon Rd., Blackburn. [X3649]

TRIUMPH, 1914, 4 h.p., Sturmey 3-speed, new lamps, all accessories, Dunlops, new belt; offers; after 6.—243, Deane Church Lane, Bolton. [3615]

1914 Triumph Coachbuilt Combination, 3-speed Sturmey hub, lamps, horn, tools, perfect running order; £84.—8, Harley St., Coventry. [X3576]

TRIUMPH 3½ h.p., 1912-13, Bosch, very little used, stored during war, everything perfectly good and smart; £38.—161, Kew Rd., Richmond, S.W. [3736]

3½ h.p. Triumph, clutch, free engine, 1912-13, not used last 4 years, perfect, all accessories; first offer above 45 gas.—Saxby, Saddler, Margate. [X3753]

TRIUMPH Junior, 1919, arrived too late for owner, gone abroad, new, unriden, countershaft gear; best offers over £75.—Box 1,202, c/o The Motor Cycle. [4016]

1906 Triumph, 3 h.p. engine, frame, forks, tank, wheels, bars, saddle, carburettor, mudguards; £12.—Mealing, The Beeches, Frimley Rd., Camberley, Surrey. [X3220]

1919 Triumph 4 h.p., countershaft, T.T. bars, not done 100 miles, lamps, Klaxon, all accessories; best offer over £95.—E.L., 21, Market Place, Kingston, Surrey. [3645]

TRIUMPH, 1913, 2½ h.p., 3 speed, clutch, sound throughout; 50 gas., lowest.—24, Radley Rd., Tottenham. [3345]

TRIUMPH, 3½ h.p., clutch model, new tyre, good condition; £38 cash.—Fairhaven, Pathlon, Stratford-on-Avon. [X3235]

3 h.p. Triumph, 1910, free engine model, lamp sets 2 and horn, good tyres and belt, engine exceptionally good; £36.—49, High St., Saffron Walden, Essex. [X3264]

TRIUMPH Combination, 2-speed, clutch model, lamp, horn, etc., excellent condition; bargain, £66; after 6 p.m.—Brooks, Hairdresser, High St., Eltham. [3540]

TRIUMPH Combination, 1912, 3½ h.p., Mabon, variable gear, clutch, coachbuilt sidecar, electric lamps and battery; £50; after 6 p.m.—14, The Arcane, Surbiton. [X3667]

TRIUMPH 1914 4 h.p., 3-speed, coachbuilt sidecar, first-class condition throughout, new tyres and Pedley belt, carefully driven; 70 gas.—77, North Parade, Aberystwyth. [3455]

1919 Triumph, 4 h.p., countershaft, kick start, P. and H. lamps, Klaxon horn, etc., complete outfit new; price £105; viewed London.—Box 1,190, c/o The Motor Cycle. [3561]

1912 Triumph, modernised, 2-speed, clutch, speedometer, lamps, Bosch watertight, fully equipped, excellent condition; bargain, £55.—Filmer House, Filmer Rd., Fulham. [4042]

TRIUMPH, 1913, 3-speed, clutch model, light torpedo sidecar, stored during war, just been thoroughly overhauled, whole in fine condition; £75.—22, Beaham Rd., Brixton Hill. [3768]

4 h.p. 1914 Triumph, clutch, Bosch mag., excellent running order, T.T. engine and handlebars, complete with lamps and horn, tyres new; £60.—Stock, Aerodrome, Witney, Oxon. [X3544]

TRIUMPH, 3½ h.p., 3-speed, clutch, with underlung coachbuilt sidecar, horn, tools, spare tyre and tube, engine valve and belt; best offer over £65; seen 8.30 a.m. to 1.30 p.m., or after 6.—Florence, 14, Fernon Rd., Hopton Rd., Streatham. [3543]

1919 Triumph, brand new, ridden few miles, coachbuilt combination, 4 h.p., mag., 3 speeds, Klaxon, Lucas lighting, speedometer; first cheque, 145 gas.—Brown, 1, Esher St., Wandsworth. [3769]

TRIUMPH, 1914 late, 4 h.p., 3-speed, Sturmey-Archer, Bosch mag., Lucas lamps, speedometer, engine new condition, too last for owner; £60 gas.—Martia, 432, Lower Addiscombe Rd., Croydon. [X3254]

TRIUMPH Junior, brand new, not ridden 10 miles, guaranteed sound as delivered from makers, ready to ride away; owner unable use same; £62 cash, no offers.—E.N., 84, Barons Court Rd., Kensington, London. [3632]

1919 Triumph (4 h.p., 3-speed, countershaft) Combination, sidecar fitted with hood and windscreen, complete with lamps, horn, tools, in perfect condition; £145.—Bond, 37, Eastward Ho, Leiston, Suffolk. [X3600]

1916 Triumph 4¼ h.p. Countershaft Combination, Gloria coachbuilt, luggage chassis, 3 Lucas lamps, mirror, large horn, Cowey, all perfect condition, 2 new spare covers; £100.—343, Aylestone Rd., Leicester. [X3341]

MOTOR CYCLES FOR SALE.

Triumph.

TRIUMPH 1914 3½ h.p. Free Engine Clutch Model. Bosch magneto, speedometer, horn, acetylene lamps and generator, with coachbuilt sidecar, mupholstered, laid up during war; £65.—Box 1,1979, c/o *The Motor Cycle*. [3562]

TRIUMPH, 3½ h.p., single-speed, fitted with wheels, pulley, forks, handle-bars, cylinder, P. and H. lighting set (all new), splendid running order, just flies up any hills; first M.O. £40 secured.—Hayes, 40, Waddington St., Kidderminster. [3548]

1919 Triumph Junior, from makers April, with lamps, horn, etc., and several new spares; £65; or would exchange for any recent machine over 3½ h.p., or combination, with cash adjustment.—Box 1,1983, c/o *The Motor Cycle*. [3558]

3½ h.p. Triumph, 2-speed, free engine, kick start, and **32 Watsonian** lightweight sidecar, machine in perfect condition, modernised by Triumph Company, extra wide 2 gallon tank fitted; £55, lowest.—Coleman, 14, Elderberry Rd., Well Hall, S.E.9. [X3709]

TRIUMPH, 1914, 4 h.p., Sturmer-Archer 3-speed, Bosch, tyres good, Cowey speedometer, horn, pump, tools, thoroughly overhauled and renovated, plating almost like new, sound mechanical condition; best offer over 70 gns.; Wiltshire.—Box 4,115, c/o *The Motor Cycle*. [X3683]

TRIUMPH, 3½ h.p., late 1913, clutch, 3-speed Sturmer-Archer, decompressor model, new back tyre, spare tyre, horn, mirror, head lamp, and spares; expert examination invited; not used nearly 5 years, just overhauled; privately owned, Surrey; £50, no offers.—Box 1,2031, c/o *The Motor Cycle*. [4026]

1916 4 h.p. Countershaft Triumph and Montgomery carrier, Jones speedometer, Lucas head light and horn, original belt, in perfect condition, all tyres as new, Waigh's front mudshields, mechanically perfect throughout, mileage 5,400; £110.—Milward, Wood St., Swindon. [4018]

T.T. Triumph, 3½ h.p., early 1915, specially built for racing, lamp, generator, Palmer Cord tyres, Triumph adjustable pulley, new Dunlop belt, condition as new, enamel and plating absolutely perfect, hardly a nut touched by a spanner; any of the lads wanting a speed 'bus, this is it; do 65 m.p.h. and over; nearest to £80 secured; buying combination, or would exchange for one.—Captain R.A.F., Briar Hedge, Bourne End, Bucks. [3545]

SMARTEST outfit on the road.—1919 4 h.p. Triumph, 3-speed countershaft, latest Empire du Luxe sidecar, extension over knee, with wind screen, mupon, and overize heavy tyre, Lucas head light set, rear lamp, Klaxon horn, Watford speedometer, set of discs for wheels all round (not fitted); the lot cost at list price £140 three weeks ago, and is good as brand new, guaranteed perfect; to be sold to the highest offer.—49, High St., Sutton Walden, Essex. Phone 45. [X3262]

Velocette.

LIVERPOOL and District Agents for Velocette. Place orders now to secure early delivery.—Victor Horsman, Ltd., 9, Parr St., Liverpool. [0005]

Werner.

WERNER 3 h.p. Twin, Bosch, B. and B., new belt, low machine, in running order; £17, or nearest.—73, Oakhurst Grove, East Dulwich, S.E. [3674]

Vindec.

VINDEC, 6 h.p., 2-speed, kick start, and sidecar; £45.—29, St. Leonards' St., Bromley-by-Bow. [3820]

2 h.p. Vindec, Clater frame, Bosch, Douglas carburettor, Romi non-skid, low, fast; £20; no dealers.—91, Fairfield Rd., Bow, E.3. [3740]

V.S.

5 h.p. V.S., fitted with wicker sidecar, Fafair twin-cylinder engine; £35.—Wanchape's, 9, Shoe Lane, London. [3945]

Williamson

8 h.p. Williamson Combination, grand climber, will take 3 anywhere, trial appointment, experts invited; £130; particulars stamp.—D. Roberts, 164, High St., Blackwood, Mon. [X3640]

WILLIAMSON 8 h.p. Water-cooled Combination, double seated sidecar, side by side, hood, wind screen, Lucas lighting, spare new tyre, late model, perfect condition; £120.—Dickinson, 33, Manor Rd., Richmond. [3703]

WILLIAMSON Combination, C.B., 8-10 h.p., water cooled, 2-speed, clutch, bought new late 1914, stored since 1916, recently overhauled, splendid condition, too fast for owner; best offer over £115.—Vicarage, St. Leonard's, Tring, Herts. [X3550]

1914 Williamson 8 h.p., water-cooled, P. and H., Bosch, speedometer, horn, double seated coachbuilt sidecar, stored during war, recently overhauled, enamelled and plated, good tyres, splendid condition.—Apply, 3, Hulsea Terrace, North End, Portsmouth. [3444]

Wolf.

WOLF 2½ h.p. 1914 4-stroke, excellent condition, stored during war; £35.—74, Holmdene Av., Herne Hill, S.E.24. [3806]

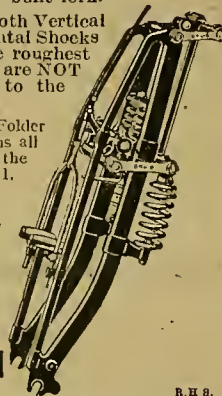
WOLF, 2 h.p., overhauled, re-enamelled, very smart, Bosch, Amac, tyres good, new Dunlop belt, good running order; £16/10.—Hammond, Gammersgill, Middleham, Yorks. [X3189]

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MOTOR CYCLES FOR SALE.

Wooler.

JONES' Garage, special agents for Woolers, Broadway, Muswell Hill, N.10, and Woodside Parade, North Finchley. [2928]

Yale.

YALE 1916 Combination, coachbuilt sidecar, perfect condition; £160, or offer; after 6 p.m.—Samuels, 96, East India Dock Rd., E.14. [3496]

Zedel.

ZEDEL 5.6 h.p. twin, Splittorf mag., Amac carburetter; £22.—Roberts, 80, de Grey St., Hull. [X3212]

Zenith.

6 h.p. Zenith-Gradua, splendid condition; £58.—Willson, 36, Fairfield Rd. South, Kingstou. [3412]

ZENITH-GRADUA 3½ h.p., 1916, as new; £65; after 6 p.m.—2, River Av., Palmer's Green, N. [3901]

3½ h.p. Zenith-Gradua, variable gear, J.A.P. engine; £38.—21, Church Hill, Hoe St., Walthamstow. [3533]

ZENITH-GRADUA 1916 4 h.p. T.T. Model, condition as new, very fast, sporty; lot £55, or near offer.—W. Knight, Sewardstone, Chingford. [X3342]

ZENITH-GRADUA, 1914, 4 h.p., T.T., enamelled red mechanical horn, ride away; £55; seen after 6.—11, Avenue Gardens, Acton, W.3. [3781]

ZENITH, 5.6 h.p., 1913, new belt, variable gear, Henderson sidecar, all new tyres, just overhauled; £90, or near offer.—J. J. Burgess, Batterdale, Hatfield. [3531]

3½ h.p. Zenith-Gradua J.A.P. Combination, B. and B., lamps, horn, powerful, splendid condition; £66.—113, Mayfield Rd., Sandstead, Croydon, S.E. [3874]

ZENITH-GRADUA Combination, 4 h.p., Bosch B. and B., bring money ride away; £50, no offers; seen by appointment.—29, Abbots Park Rd., Leyton, E.10. [X3231]

ZENITH 6 h.p. Clutch Combination, new 1914, stored since 1915, large coachbuilt sidecar, excellent condition; £95.—Write Arliss, 56, Cranes Park, Surbiton. [X3543]

1915 Zenith-Gradua 4 h.p., light C.B. combination, mechanically perfect, looks like new, electric lighting; 85 gns.—Can be seen at 33, The Parade, Golden's Green. [3895]

ZENITH 8 h.p. T.T., late red model, tyres new, electric lights, mechanical horn, spare belts, tyre, etc., splendid condition; £80, bargain.—573, High Rd., Tottenham. [3805]

ZENITH-GRADUA 1914 5.6 h.p. Twin, clutch wheel, lamps, horn, and accessories, not used since petrol restrictions; £56.—W., 11, Simpson St., London, S.W.11. [3328]

ZENITH-GRADUA, 6 h.p., 1915, fast, powerful, Lucas lamps, Watford speedometer, horn, complete kit, spare valves, springs, belt; £80.—Write, 22, Copley Park, Streatham, S.W. [X3352]

ZENITH-GRADUA, 1914, 6 h.p., Gloria spring wheel coachbuilt sidecar, luggage carrier, Klaxon, lamps, very powerful and in splendid condition; £82.—Gowns, Broadway, Walton-on-Thames. [3608]

ZENITH-GRADUA, 1916, 4.5 h.p., and sporting lightweight torpedo sidecar, semi-T.T., fast, lamps and horn ready for road; £70, no offers.—E.C.W., "Phyden," Chipstead, Coulsdon, Surrey. [3753]

ZENITH 6 h.p. Twin Combination, very little used, Swan sporting torpedo sidecar, wind screen, nearly new tyres, Klaxon speedometer, tools; £140, or nearest.—Lieut. Dunford, Park Rd., New Barnet. [3746]

1916 Zenith, 5.6 h.p., countershaft, Canoelet sidecar, lamps, speedometer, mechanical horn, etc., ridden 6,000 miles, appearance as new; £95.—Williams, Catherine Villa, Closeworth Rd., Farnborough, Hants. [3682]

ZENITH-GRADUA, 3½-4 h.p., perfect condition, new heavy Dunlops and tubes, all accessories and tools, new John Bull belt, seen any day after 6 p.m., trial; £52.—88, Mount View Rd., Stroud Green, N.4. [3365]

ZENITH-GRADUA Combination, 1913, twin 6 h.p. J.A.P., coachbuilt sidecar, repainted, Bedford cord upholstery, speedometer, lamps, sound; £90.—Banister, 70, Park Lane, Irlams o' th' Height, Manchester. [X3258]

4 h.p. Zenith-Gradua J.A.P. Twin, 1914, T.T., Milers lamps, horn, spare belt, fast and reliable, splendid condition throughout; seen any time; best offer over 52 gns.—Bond, Church Farm, Sutton Bonner, Clippenham, Wilts. [3911]

ZENITH-GRADUA, 1914 special model, 90 bore, O.H.V. J.A.P., unused two years, overhauled and re-enamelled, two new tyres, C.B. sidecar, fast, powerful; £100, or exchange sporting three-wheeler 1914 Morgan type.—171, St. Helen's Rd., Bolton. [X3208]

ZENITH, T.T., 8 h.p., 1919, with Flying Middleton sidecar, F.R.S. largest head lamp, Lucas rear (lit once), Klaxon and bulb horns, Empire petrol economiser, knee grips, spare belt, plugs, etc., machine is as new in every respect; seen any time; price £150.—81, Lakeside Rd., Palmer's Green, London, N. Phone: 828 Palmer's Green. [3670]

Ladies' Motor Cycles.

LADY'S Connaught, Sturmer-Archer 3-speed, kick starter, lamp, horn, perfect; £45.—Thwaites, Farnham Rd., Bury St. Edmund's. [X3236]

SIDE-CARRIERS AND PARCEL-CARS.

- DARRACQ** Covered Van, 15-cwt., 12h.p., very reliable; £115.—232, Brixton Rd., S.W.9. [3830]
- PEUGEOT** Van, 12-14h.p., new body, mechanically perfect; first cheque over £87 secures.—Costa, 1 Victoria Rd., Brighton. [3932]
- 8h.p. Reading Tradesman's Carrier**, large box in front of driver's seat, new but shop-soiled, 3-speeds, clutch, and kick-starter, all chain transmission, sprung back and front; £125.—Wanchope's 9, Shoe Lane, London. [3951]
- STUDEBAKER** Flanders 16-20h.p., 15-cwt. Van, 4 new tyres, lamps, horn, speedometer, new Hobson carburettor and extra air; any severe trial or expert examination; £210.—161a, Camberwell Grove, S.E.5. Phone: Brixton 236. [3785]

RUNABOUTS AND CYCLE CARS.

- GIRLING** cycle car, 3-seater, complete; any trial; £60.—65, Burnt Ash Rd., Lee, S.E.12. [3745]
- SALE**, Riley Runabout, splendid condition, overhauled, ready for road; £50.—49, Commercial St., Riscia. [3240]
- CYCLE** Car, 10h.p., twin engine, 2 seats and dicky, hood, etc.; £87/10.—232, Brixton Rd., S.W.9. [3826]
- A.C.** Sociable, hood, screen, spares, very smart; £50 gns.; bargain.—Clegett, 31, Ballour Rd., Chatham. [3836]
- SMART** 8-10h.p. Cycle Car for immediate use; £95. Garage for disposal.—Details from Atkinson, Bank Road, Worthington. [X3363]
- HUMBERETTE** Light Car, perfect mechanical order, lamps horn, speedometer, etc.; £160.—15, Wickham Rd., S.E.4. [3775]
- 1918**—Morgan 8h.p., w.c., dynamo lighting, hood, screen, a perfect turnout; £225.—C.A.B. Co., 21, Hobson St., Cambridge. [3857]
- A.C.** Sociable, up-to-date model, 2-speeds and reverse, fully equipped with hood and screen; price 100 gns.—Wanchope's 9, Shoe Lane, London. [3952]
- A.C.** Sociable, excellent little machine, tyres as new, 2 new spare wheels, lamps, hood, screen, etc.; £70, or offer.—S. P. Webb, High St., Fordingbridge, Hants. [X3359]
- RUNABOUT**, 3-wheel, N.S.U., just been overhauled, in perfect condition; £80; any evening, starting photo.—Parris, 7, Old Paradise St., Lambeth, London. [3966]
- A.V. Monocar**, 1919, J.A.P., Zenith, very fast, owner leaving country; £110 or near offer.—Write or call, Monocar, c/o 113, Kingston Rd., Wimbledon, S.W. [3902]

MORGAN, late 1915, sporting model, complete with hood, screen, and lamps, little used, owner been in the service; £115, no offers.—Chaffey's Boot Stores, Stoke-under-Ham, Somerset. [X3519]

8-h.p. Chater-Lea Runabout, 2-seater, w.c., Bosch, clutch, 2-speed, all chain drive, been stored; £65; mechanically perfect, drive away.—Pickwick House, Strood Hill, Rochester, Kent. [3407]

BEDLIA Cycle Car, sporting runabout, dual ignition, good running order except belts lost in storage; first £35 gets it.—Wood Cottage, Magazine Lane, New Brighton, Cheshire. [X3259]

CYCLE Car, 8-10h.p., Grado gear, condition as new, fully equipped, head, tail, and side lamps, clock, speedometer, ready for road; 135 gns.—Apply, Walker, 13, Lawrence St., Mill Hill, N.W.7. [4044]

BARGAIN for quick sale; owner leaving.—Bedlia 7-9 h.p. 2-seater cycle car, repainted, refurbished, etc., throughout, many improvements, better than new, fast, climb anything, new hood, tyres and spare, screen, electric horn, side and tail lamps, gas head, dual ignition, very comfortable worst roads, unused during war; trial; seeing means buying; £35, no offers.—Major Harris, c/o Mrs. Orfit, Bridge, near Canterbury. [3644]

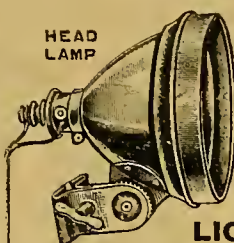
DUO 4-wheeler, 1914, 8h.p. J.A.P., Bosch, Binks, 2-speed, chain and double belt final, with variable driving pulleys, kick and handle starting, Hele-Shaw clutch, spare wheel, 5 good tyres, back new Dunlops, electric side and rear and acetylene head lamp, 5 belts, hood, screen, horn, tools, and spares, complete overhaul in April, repainted yellow, black lined and wings, upholstered, very handsome little car; price £125, offers.—Write, Duo, Hazel Wood, Fembark Rd., Ascot. [X3500]

CARDEN Monocars, 1919 models; deliveries daily.—The Railway Garage, Staines (Phone 139), sole concessionaires, commend these ideal little runabouts as thoroughly practical for pleasure, for professional, or commercial hard use. The protection of a car at the price of a motor cycle. Fast, silent, no starting handle; a lady can operate the seat kick starter with ease. Specification, 8h.p. J.A.P. engine in front, 3-speed Sturmey-Archer gear box, all controls inside, perfect accessibility, removable scuttle, economical, 50-60 m.p.g., Dunlop tyres, 105 gns.; accessories and tandem seat extra; delivery in strict rotation, about one month from receipt of deposit with order. Call and take trial run. [3311]

CARS FOR SALE.

- LIGHT** Car, £33; running order, owner going abroad.—Coleman, 95, Upper North St., Brighton. [3983]
- METZ**—12h.p. Friction-driven Light Car; £55.—Hamilton, Burchett's Farm, Ockley, Surrey. [3430]
- LANCHESTER** 6-cyl. Open Touring Car, very economical on petrol; £375.—234, Brixton Rd., S.W.9. [3827]

HEAD LAMP

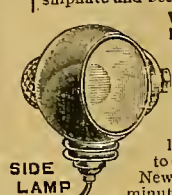


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British Made.

DRY BATTERY LIGHTING SETS

Volex Lighting Sets are the ideal, no-trouble outfits for the Motor Cycle and Sidecar. For over ten years they have been in use for this service, and of recent years in consequence of their dependency, the demand is constantly increasing. Dynamo Lighting Sets with Accumulators require careful attention and owing to complications have a tendency to go out of order. Accumulators if not regularly charged, whether in use or not, sulphate and become useless.



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VOLEX DRY BATTERY LIGHTING SETS give no trouble whatever. The battery which is fitted in a steel container with switchboard mounted on top, lies conveniently in the bottom of the sidecar, and with ordinary care will last, when in use, from six months to eighteen months without renewal. New Battery can be fitted in a few minutes at but little cost. The Battery Case contains three separate Volex 4-volt Aero Dry Cells, with separate connecting boxes for the cable to Head, Side and Rear Lamps. If one of the batteries become exhausted it can be replaced independently of the others. Unless specified, we always provide 4 volt Metal Filament Bulbs to each lamp, but 8 volt Bulb for Head Lamp will be provided where desired. Complete outfit (as illustration), including Head Lamp, Ball Pattern Side and Tail Lamps, 3 Volex Aero Dry Batteries in steel container with switchboard, Metal Filaments, Bulbs, and Waterproof Conducting Cords. Price £5 15s. Snare "Volex" Aero Batteries 12/6.

CAUTION—We would warn users that they may be offered substitutes for the "Volex" Dry Battery. No other battery will approach in reliability, durability, or capacity the British Made "Volex".



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Apply — **METEOR Mfg. Co., Ltd.**, 98, Tollington Park, N.4.



Motor Car Houses AND **Portable Buildings** of every description.

ILLUSTRATED LIST FREE.

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CARS FOR SALE.

- 6h.p. Gardner-Serrollet** Steamer, paraffin fuel, 4-seater, good tyres, in running order; £30.—Reeve, Walderslade, Chatham, Kent. [X3485]
- LANCASHIRE** (except Fylde), Cheshire, and Isle of Man official dealers for A.V. light cars. Buyers order now.—J. Blake and Co., Liverpool and Manchester. [3655]
- EARLSFIELD** 2-seater, single-cyl., 6h.p., coil, flat belt drive, 2 speeds, reverse, old type; afternoon or evenings; £15.—R., 203, Beckenham Rd., Beckenham. [3969]
- 10h.p. Ariel** 4-cyl. engine, Cardan drive, 3-speeds, and reverse, fully equipped with accessories, hood, screen; £250.—Wanchope's, 9, Shoe Lane, London. [3943]
- 2-SEATER** De Dion, perfect order; £40, or near offer; would consider lightweight motor cycle in exchange.—Apply, 22, Somerset Rd., Meadvale, Redhill, Surrey. [3723]
- MOTOR** Car Sale; Swift 2-seater, single-cyl., about 8h.p., hood, lamps, Steppay, wind screen, all in running order; £75.—Particulars, Box L2,030, The Motor Cycle. [4025]
- ARGYLL** Car, 16h.p., thorough sound mechanical order and condition, ready to drive away; would take motor cycle part exchange.—Wellington, 94, East St., Bridport, Dorset. [3343]
- 10h.p. Morris-Oxford**, fully equipped, Lucas dynamo lighting, hood, screen, 5 spare wheels and tyres complete, magnificent finish, excellent model; £425.—Wanchope's 9, Shoe Lane, London. [3948]
- REALLY** Good Cars at really right prices. I have them. And remember many of the cars thoroughly overhauled and all in good running order at the prices advertised. All dates advertised by me guaranteed accurate. 6h.p. 1914½ Warrick box auto-carrier, £60; 8h.p. De Dion 5-seater, 3-speed, runs well, £95; 15h.p. Darracq lorry, 4-cyl., all solid tyres, mag., runs well, £120; 12h.p. Swift 2-seater, gate, £125; 14-16h.p. Darracq lorry, 4-cyl. monobloc, Claudel, cab, detachable sides, £145; 12-15h.p. Star chassis, Doss, live axle, gate, 4-speed, £150; 10h.p. O.T.A.V. (Italian) semi-sporting 2-seater, live axle, gate, £165; 15h.p. Darracq 4-seater, Coronation model, gate, £165; 18h.p. Vivinus torpedo 3-seater, £185; 10h.p. Delahaye light van, enclosed valves, 4-speed gate, £185; 10h.p. Hurlt 2-seater, 4-cyl. monobloc, enclosed valves, gate, £235; 20-30h.p. Florentia chassis, live axle, gate, 4-speed, runs well, £250; 10h.p. Lagonda coupe, 4-cyl. monobloc, worm drive, Sankey wheels, streamline dash, pointed radiator, dynamo lighting set, £275.—Cox (below).
- SINGER** 1915 Light Car, enclosed valves, 10h.p., smartly repaired, azure, £295; 11h.p. Briton torpedo, enclosed valves, detachable wheels, pointed radiator, £295; 15h.p. 4-cyl. Standard streamline torpedo, gate, Zenith, smart, £325; 11h.p. Colibri streamline torpedo, monobloc, enclosed valves, detachables, £325; 18h.p. Ariel torpedo 2-seater, double dicky, detachable wire wheels, 4-speed gate, Zenith, £335; 1917½ 18h.p. Maxwell streamline torpedo, electric starting, dynamo lighting set, monobloc, detachables, £335; 12-14h.p. F.I.A.T. streamline torpedo, dynamo lighting set, monobloc, detachables, £350; 1915 Studebaker torpedo, £350; 1915 Hupmobile chassis, Model K, £375; 15h.p. Standard 3-seater, monobloc, enclosed valves, Sankey detachable wheels, worm drive, dicky, £385; 15h.p. Arrol-Johnston torpedo, Sankey wheels, enclosed valves, 4-speed gate, £385; 12-15h.p. Panhard landaulet, monobloc, live axle, roomy body, £385; 12-15h.p. S-beam landaulet, enclosed valves, detachable wheels, 4-speed gate, £450.—Cox (below).
- SUNBEAM** 1913 12-16h.p. Chassis, detachable wheels, monobloc, enclosed valves, £500; 11h.p. Knight landaulet coupe low and smart, 4-cyl. monobloc, sleeve valve engine, detachable wheels, worm, dicky, £485; 14h.p. De Dion super-taxi ¼ landaulet, pass Scotland Yard, 4-cyl. monobloc, 4-speed, ordinary gate, detachables, beautiful condition, £575; 14-18h.p. Leon Bollee torpedo, enclosed valves, detachable wire wheels, 4-speed gate, £585; 1914 18-24h.p. Siddeley-Deasy chassis, sleeve valve, worm, cantilever, detachables, overhauled, £550; 12-15h.p. F.I.A.T. dainty ¼ landaulet, Brasby coachwork, large ¼ windows, curved roof, monobloc, enclosed valves, £685; 1915 16-22h.p. Napier chassis, £700; 1917 15-20h.p. F.I.A.T. chassis, £750.—Cox (below).
- COMMERCIALS**. Heavies. All following have twin solid rubber tyres. Many completely overhauled and retired: 30-cwt. Milnes-Daimler van, Bosch, Zenith, 4-speed, aluminium radiator, £150; 2-ton De Dion, 15h.p., 4-cyl. sump lubrication, geared axle, vertical gate, £200; 30-cwt. Lacre van, mag. gate, extra roomy body, suit furniture, etc., £225; 3½-ton Milnes-Daimler chassis, L.G.O.C. engine, thoroughly overhauled, sump lubrication, 4-speed gate, rear drive, bargain this, £250; 3-ton worm drive De Dion chassis, late model, enclosed valves, sump lubrication, steel wheels, £300; another, better, overhauled, £350; with lorry body, £385; 3-ton 1914 Seabrook lorry, enclosed valves, 40h.p., gate, fine lorry, £425; ditto, overhauled and all new tyres, £485; 1915 ditto, ditto, £525; 2½-ton 1914 Karrier lorry, 4-speed, £550; 3-ton 1914 Karrier lorry, Taylor engine, enclosed valves, 4-speed, overhauled and retired, £585; 3-ton 1916 Vinal lorry, monobloc, worm drive, 4-speed Zenith, £650; 3½-ton 1914 Napier lorry, worm drive, enclosed valves, 4-speed, Zenith, £685; 4-ton Scout, enclosed valves, worm drive, £750.—Cox (below).
- DOUGLAS** S. COX, the absolutely straight motor man, 66, Lansdowne Hill, West Norwood, S.E. has all the above actually in stock. Please call, hours 8 to 6.30, including Saturdays, no business Sundays. Established 1902. [3858]

CARS FOR SALE.

15 h.p. Humber Sporty 2-seater Car, 3-speed and reverse, 4 cyls., mag., water cooled, disc wheels, body unsat. red; very trial; first cheque £150 secures; genuine bargain.—Bacon, 41, Montpelier St., Brighton. [X3710]

RAILWAY Garage, Staines (Phone 139), offer tourists: Detroit £250, Martini £85, Ford Gordon landaulet 300 gns.; 2-seaters: Whiting-Grant £250, sizeaire £145; new 1919 Curden monocoers, 105 gns. (see Runabout); inspection invited. [X3712]

ENGINES.

ENGINE Pebok, 2½ h.p., thorough condition; £23/10.—57, Mill Hill Rd., Acton, W. [X3847]

31 h.p. Wolf Engine, frame, tank, £5; Druids, £1.—Brotherton, Oxford St., Chorley. [X3844]

19 13 Triumph Engine and ZE Watertight Magneto for sale; price £20.—59, Cheap St., Newbury. [X3800]

19 14 4 h.p. T.D.C. engine, top hole condition; £8.—Mealting, The Beeches, Frimley Rd., Camberley, Surrey. [X3221]

6 h.p. J.A.P. Twin, new, present pattern, open drive, adjustable tappets, etc.; £30.—Particulars, Martin, 90, Tyne-mouth Rd., South Tottenham. [X3482]

19 14 2½ h.p. T.D.C. Engine, never used, complete with Thomson-Bennett magneto; after 7.30; £15.—87, Mayfield Av., West Ealing, London, W.13. [X3777]

6 1 h.p. Water-cooled Rover Car Engine, clutch, and 2 gear box unit complete, less mag., in good condition; £12, or offer.—Barapill, St. Germans, Corn. [X3630]

7 9-h.p. Peugeot Engine, n.i.v., £3/10; Bosch magneto, 4½ twin, anti, type DAV, £4/10; 2-speed rear box (chain), suit cycle car, £1/10.—Hayden, New Haw, Addlestone. [X3334]

GOOD 6 h.p. a.i.v. Twin Engine, complete with a 1912 Bosch magneto, carburettor, and exhaust pipes, free engine; lot £11/10, no offers; seen mornings, or write.—Lightfoot, 314, Gray's Inn Rd., London, W.C. [X3778]

IGNITION APPLIANCES.

BOSCH Single, £3; Bosch 4-cyl., £6/10.—12, Thesiger Rd., Pease, S.E. [X3550]

SIMMS-BOSCH Magneto, single cyl., good condition; £3.—29, Brudenell Rd., Leeds. [X3257b]

BOSCH Type ZA2, suit Douglas flat twin; £6/15.—A. Rich, New Rd., Ponders End. [X3628]

SINGLE Simms Magneto, just overhauled by makers; £5/10.—Payne, Burley Gate, Hereford. [X3765]

U.H. Magneto, perfect 2-stroke model, almost new; £4.—Midgley, 43, Equitable St., Millarow. [X3495]

FOR Sale, Bosch twin magneto, in perfect condition; £4.—Reay, Corvoran, Greenhead, Carlisle. [X3473]

BOSCH Magneto for Douglas, splendid sparking condition; £5.—180, Parliamentary Rd., Glasgow. [X3233a]

BOSCH Magneto, type ZE1, suit single, not in use last 3 years; £5.—7, Grafton Rd., Bedford. [X3618]

BOSCH ZE1 Anti-clock, driving end, nearly new, perfect; £6, after 7.—20, Ospringle Rd., Tufnell Park. [X3635a]

BOSCH Magneto, twin, D.A.V., advance-retard lever, sprocket, perfect; £6/10.—Hunter, 8, Mason St., Chester. [X3530]

BOSCH 6-cyl. Magneto, very latest type, brand new; nearest offer to £20.—A. Moss, Station Rd., Liphook, Hants. [X3552]

SPLITDORF 50° Twin, suitable for Enfield, J.A.P., A.J.S.; £8/10; brand new.—Euston Ignition Co., 335, Euston Rd., N.W.1. [X3451]

FOR Sale, Bosch magneto, 45°, type ZE5, perfect condition; £6/15.—Clarke and Simmons, 41, High St., Strood, Kent. [X3817]

BOSCH ZA 4-cyl. Magneto, brand new, £10; two contact breakers, as new, complete, 10/- each.—Botter, Bootmaker, Bracknell. [X3619]

MAGNETOS Sprockets, in any metal, size, screwing or taper, from 5/6; terms to trade.—Valhugh, 6, Temple Row, Birmingham. [X1131]

THE Euston Ignition Co.'s 12-hour repair service; guaranteed repairs to all types of magnetos; rewinding, remagnetising.—335, Euston Rd., N.W.1. [X3833]

MAGNETO, Thomson-Bennett, watertight, twin, 180°, new, with spare contact breaker; £5, or exchange for 50°.—Box 4,101, c/o The Motor Cycle. (D) [X3474]

BASTONE'S.—Dixie single-cyl. magnetos, anti or clockwise, £3/18/6; also a few other singles and twins in stock.—228, Pentonville Rd., King's Cross, London, N.1. [X818]

BRAND New Weatherproof Magnetos, best make, singles and twins, 50°, anti-clockwise; limited number at greatly reduced prices; approval.—Booth's Motories, Halifax. [X5126]

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2½ h.p. twin N.U.T., overhead valves, Sturmev-Archer countershaft gear, clutch, kick-starter, lot of accessories.

Condition as new £95

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2-speed, clutch, kick-starter, access. £50

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1918 HARLEY-DAVIDSON Combination, 3-sp., clutch, kick-starter, gas cylinder lighting. Very good condition £150

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1913 G.W.K., in splendid condition .. £150

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CONTACTS for magnetos, etc. Sydium, the auriferous metal, lasts indefinitely. Customers' own screws or blades fitted, 3/6 each, post free; returned same day.—Silverdale Mfg. Co., Victoria St., Birmingham. [X2359]

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BASTONE'S.—26x2½ Michelin Trident heavy 32/9, De Luxe heavy 32/-, Invincible rubber-studded 21/-.

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Cycle and
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LEGGATE, Edinburgh.—1919 new pattern, 6-ply fabric, extra heavy, rubber studded, beaded covers, 26x2½, 47/6, list 63/6; 26x2½, to fit 2¼ rims, 47/6, list 63/6; 26x2½ 47/6, list 63/6; 650x65, 49/-, list 65/-; 700x80, for 650x65 rims, 51/-, list 68/6; absolutely perfect for high-powered machines.

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ECONOMIC Tyre Co.—New clearance covers, Kempshall, Macintosh, and other well-known makes.

ECONOMIC.—We send goods on 7 days' approval carriage paid against remittance.

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ECONOMIC.—28x2¼ Macintosh stopslip, for Indian machines, 40/-; 28x3½, for 28x3, Leyland 3-ribbed, 55/-, listed 85/-.

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ECONOMIC.—24x2¼ heavy non-skid, for 2-strokes, 35/-; complete with tube, 41/6.

ECONOMIC.—26x2½ Kempshall non-skid, Clincher 26x2½ de luxe, 26x2½x2¼ de luxe, Rom 26x2¼ rubber-studded, Rom 26x2½ rubber-studded, Wood-Milne 26x2¼ Keygrip, Goodrich 26x2¼ Safety tread, in stock, fully guaranteed.

ECONOMIC.—Tubes, 24x2¼ 7/6, 26x2¼ 7/6, 26x2½ 8/6, 650x65 10/-, 28x3 10/-.

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CHEAPEST Motor Cycle Rates. Premiums from 10/-.—F. Payne and Co., Insurance Brokers, 37, Gt.-Tower St., E.C.3. [2538]

ROY'S, Ltd.—Motor cycle insurance at Lloyd's. Lowest premiums, payable yearly, quarterly, or monthly. Write for prospectus.—170, Gt. Portland St., London. [7734]

WILLIAM HARBACH, Insurance Broker, Cradley, Staffs., for comprehensive policies and an efficient claims service. The broker who studies his clients' requirements. [3250]

COMPLETE Comprehensive Policies. Motor cycles from 37/6; Morgans, 75/-; immediate repairs permit.—Wrigleys, Lancashire's Premier Motor Insurance Brokers, The Corner, Houghton St., Southport. [1592]

Worth Waiting For.

SPEED, FLEXIBILITY,
CLIMBING POWER,
COMFORT,
CONTROLABILITY,
IN FACT

ROAD WORTHINESS

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VICTOR HORSMAN LTD.,
Parr Street, Slater Street,
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Biggest Light Car and
Motor Cycle Dealer
— in the South —

Can offer some of the following for early delivery:

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P. & M., TRIUMPH, ARIEL,
ENFIELD, MATCHLESS,
ZENITH, NEW IMPERIAL,
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DREADNOUGHT Motor Cycle Policies at Lloyd's. Premiums from £1/7/6 per annum, payable yearly, quarterly, or monthly. Before insuring elsewhere, write for prospectus. Roys, Ltd., 170, Gt. Portland St., London. [0994]

"THE Motor Cycle" Insurance Policy (subscribed by Lloyd's Underwriters) covers motor cycle or cycles and sidecars used for private purposes. Complete comprehensive cover. Maximum benefits, minimum rates. Free weekly copy of "The Motor Cycle" to all policy holders paying a premium of £3/7/6 or over.—Full particulars and prospectuses on application, The Manager, "The Motor Cycle" Insurance Department, 20, Tudor St., London, E.C.4. [0995]

TUITION.

SIDECAR Driving taught by private owner, 15 years' experience.—C., Salisbury House, Hazlitt Rd., West Kensington (near Olympia). [X3191]

MOTOR Tuition.—The British School of Motoring, Ltd., gives the highest standard of training in driving, mechanism, and repairs for the lowest fees in England. Call or write for full particulars.—The British School of Motoring, 6, Coventry St., Piccadilly Circus, W. [0953]

SHIPPING.

BUYING and Shipping for Colonial motor and cycle importers.—The best service through Lindner and Co., Ltd., Birmingham. Established 1842. [4577]

HOTELS AND APARTMENTS.

COLWYN Bay, Rhos.—The Towers, Whitehall Rd., 7 doors from Cayley Promenade. Supper, bed, breakfast, garage, 8/6.—Tel.: 233. [6533]

PARTNERSHIPS.

EXPERIENCED Man would invest up to £500 in suitable motor cycle business; within 30 miles of London preferred.—Box L2,036, c/o The Motor Cycle. [4031]

DEMOBILISED Despatch Rider 4½ years requires partnership in motor cycle business, or post as salesman-demonstrator, 12 years' experience.—Address, Mr. Fearnley, "To be called for," Post Office, York. [X3218]

WANTED, partnership in motor cycle business; advertiser has big electrical experience and could tackle magneto repairs; capital, £500 to £500; London district preferred.—Box L2,028, c/o The Motor Cycle. [4023]

DEMOBILISED Tank N.C.O., electrical, mechanical, and motor engineer, having commercial and practical experience, desires partnership in established engineering concern; prepared to put up £500-£600.—Box 4,085, c/o The Motor Cycle. [X3194]

PERSONAL.

MOTOR Cycle, Reg. No. LL 4244, unless claimed within 14 days, will be sold to pay storage charges, etc.—Webster and Son, Folkestone.

MOTOR Cycle, KT 4932, unless claimed within 14 days, will be sold to pay storage charges, etc.—Webster and Son, Folkestone.

MOTOR Cycle, AP 286, unless claimed within 14 days, will be sold to pay storage charges, etc.—Webster and Son, Folkestone.

MOTOR Cycle, DL 9938, unless claimed within 14 days, will be sold to pay storage charges, etc.—Webster and Son, Folkestone.

MOTOR Cycle, LH 2231, unless claimed within 14 days, will be sold to pay storage charges, etc.—Webster and Son, Folkestone.

MOTOR Cycle, LO 9996, unless claimed within 14 days, same will be sold to pay storage charges, etc.—Webster and Son, Folkestone. [3524]

SITUATIONS WANTED.

TWO Gentlemen require situations in motor trade, public school education, 7 years' experience all types vehicles, 4½ years' despatch riding and car driving for H.M. Forces, excellent references; Midlands preferred.—Box 4,100, c/o The Motor Cycle. [X3471]

BELGIAN Gentleman, 35 years of age, 15 years' experience in the bicycle and accessories trade, is anxious to represent British manufacturers in Belgium, fullest references will be given, at present in England, but shortly returning to Belgium; enquiries are earnestly solicited.—Write, D.V., 98, Heald Place, Rusholme, Manchester. [X3621]

SITUATIONS VACANT.

FIRST-CLASS Motor Cycle Mechanic, one who thoroughly understands all makes, and who can undertake complete overhauls. Write, stating full particulars of experience, whether married or single, and when vacant. Excellent opportunity for right man.—Box L1,997, c/o The Motor Cycle. [3647]

BUSINESSES AND PROPERTY FOR SALE, TO BE LET, OR WANTED.

MOTOR Cycle Depot in the heart of a flourishing South Coast town a few miles from Brighton; very smart premises; fortune for one understanding the trade; very high class; all at, including the highly valuable lease, £2,000; part can remain to suitable purchaser.—Box L2,039, c/o The Motor Cycle. [4041]

AGENCIES.

WELL-KNOWN Aviator and motor expert wishes to act as buying agent for good 2-stroke motor cycle.—Box L1,999, c/o *The Motor Cycle*. [3649]

MOTOR Engineer, starting garage North Riding, Yorkshire, desires agencies for cars, motor cycles, accessories, and tyres, etc.—Stead, South Otterington, Northampton. [X3494]

WELL-KNOWN French tradesman, for past 22 years in connection with all agents in cycle business in France, highest references, wishes general cycle agency for France and French Colonies of a British firm, with cash warranty for all goods.—Answer to Louis Remy, 6, Cite Riverin, Paris Xeme. [3654]

LOST AND FOUND.

WILL the motorist who picked up a square green sidecar cushion on the road about 5 miles south of Thirsk (near Thirkby), between Thirsk and Easingwold, on Monday, 19th May, kindly return same to A. K. Procter, 5, New St., York. [3478]

WHILST motoring from South Wales to London on Tuesday morning, the 10th inst., I had the misfortune to lose the high gear driving chain of a Morgan Runabout when about six miles from Cardiff. Should this notice catch the eye of finder, will be kindly communicate with T. Morgan, 10, Howard Rd., Walthamstow. [3652]

WANTED.

SUNBEAMS, Harleys, A.J.S.'s, Enfields, B.S.A.'s, Nortons, Triumphs, Matchless, and Morgans; 1915's and later purchased for spot cash.—Maudes', 100, Gt. Portland St., London, W.1. [1916]

A AAA.
BRING your machine to us before taking it else where. We will buy for spot cash; highest prices given. Lightweights and twin combinations particularly wanted. Ride up with machine, and walk out with cash.—The H.C. Motor Co., 347, Finchley Rd., N.W.3. Phone: Hampstead 4631. Open Saturday afternoons and Sundays. [5669]

ZENITHS, 90x77½ twins.—Maudes'.

B.S.A., 1916, 1917, solo or combinations.—Maudes'.

A.J.S., 1916, 1917, combinations and lightweight.—Maudes'.

ENFIELD 1916 and 1917 Combinations.—Maudes'.

DOUGLAS 1915, 1916, and 1917 2 and 3-speed Models.—Maudes'.

MATCHLESS 1915, 1918, and 1917 M.A.G.-engined Combinations.—Maudes'.

HARLEY-DAVIDSON 1917 Electric and Standard Combinations.—Maudes'.

MORGANS, 1915, 1916, and 1917 water-cooled J.A.P. and M.A.G. models.—Maudes'.

TRIUMPHS, 1915, 1916, and 1917 Lightweight and countershaft models.—Maudes'.

SUNBEAMS, 1915, 1916, 1917, single and twin combinations.—Maudes'.

MAUDES' are buyers of any of the above for spot cash, very highest prices for machines in good condition.—100, Gt. Portland St., London, W.1. [4371]

HAVE you a lightweight for sale?

HAVE you a combination for sale?

IF so, please bring for us to buy.

OR forward fullest particulars at once.

AGENTS, we will purchase from 1 to 50.

ONLY modern and well-known makes considered.

MEBES and Mebes, Motor Cycle Depot, 154-6, Gt. Portland St., W.1. [3696]

WANTED, 10h.p. 4-cyl. Winton cycle car.—Tonge, Holmesfield, Sheffield. [X3345]

ENGINE wanted, 3½-5h.p., single or twin.—1, Church St., Luton. [X3600]

SIDECAR for 4¼h.p. James.—Walters, 61, Westow Hill, Norwood, S.E.19. [3400]

WANTED, lamp set and knee grips.—Jenkins, 12, High Rd., Lee, S.E. [3955]

PAIR Scott Cylinders, 1914, and Douglas footrests.—12, Percy St., Hull. [X3648]

WANTED, coach-built Sidecar.—Fitch, Hartley Wintney, Basingstoke. [3758]

WANTED, good solo machine; spot cash.—C.S., 14, Swaton Rd., Bow, E.3. [3417]

WANTED, good combination; spot cash.—C.S., 14, Swaton Rd., Bow, E.3. [3418]

WANTED, good coachbuilt side; spot cash.—C.S., 14, Swaton Rd., Bow, E.3. [3420]

FRONT Cylinder for 2½h.p. twin Enfield.—Goddard, Norwood Court, Southall. [3399]

COMBINATION, any condition if cheap.—63, Walm Lane, Cricklewood, N.W.2. [3382]

Motor Houses and Cycle Sheds.



Built in five sizes, the three largest sizes made in sections which are mortised and tenoned together, a method of manufacturing which few makers adopt, but it will be evident to anyone that this method is infinitely superior to any other specification.

Specification: Built throughout from ½ in. selected tongued and grooved and V jointed matchboards in sections as described, to bolt together. Strong double doors, full width of end-bung on extra strong hinges and provided with lock and key and Tower bolts for holding door in position, also handle to door. Range of fixed framed windows in either side, complete with glass, extra strong roof covered with best felt and battened down. Wide barge boards on each end of roof. Sloping platform in front of door to allow of easy access of Cycle or Motor.

Sizes: No. 1, 6ft. long, 5ft. wide, 6½ ft. high, 172/6, floor 35/-; No. 2, 8ft. long, 6ft. wide, 7ft. high, 245/-, floor 56/-; No. 3, 10ft. long, 8ft. wide, 8ft. high, 405/-, floor 100/-; No. 4, 15ft. long, 10ft. wide, 9½ ft. high, 660/-, floor 210/-; No. 5, 20ft. long, 12ft. wide, 11ft. high, 890/-, floor 300/-. All carriage paid to nearest Station. Prompt despatch guaranteed. Inch boards 20 per cent. extra. See booklet for further particulars.

THORNER BROS.
NEW HOUSE PELLIANE WORKS.
MYTHOLMROYD, YORKS.

'Phone: 47 Luddenden Fort.



'Grams: "AICHSEMOTO, Swiss, London."
'Phone: 4631 Hampstead.

How Can a Motor Cycle or Car be Mechanically perfect

unless it is overhauled from time to time? Many of our clients are surprised that we can give the prices we do for second-hand machines, and yet sell at such a reasonable figure. We buy a machine, and we overhaul it before we sell it. The vendor gets the value of the machine less the cost of overhaul. The purchaser gets the machine at its true value. Where do we come in? We make our profit on the overhaul—got it? Quick returns and small profits, that is our business motto. Bear these facts in mind when you contemplate a purchase. Forty-two fine bargains in stock ready for the road. Twenty going through the shops.

347, FINCHLEY ROAD, N.W.3.

WANTED.

DECENT Old Runge, about £25.—Letters, 24, Townley Rd., E. Dulwich, S.E. [2883]

WANTED, motor cycle; cash; no profiteers.—42, Prince's Rd., Holland Park. [3957]

WANTED, 2-speed gear for Radco lightweight.—69, Robert St., Plumstead. [3555]

RUNABOUT wanted; good price for smart turnout.—764, Seven Sisters Rd., N.15. [3622]

ARIEL wanted, any condition, cheap.—Write, Box 4,068, c/o *The Motor Cycle*. [X2967]

A MOTOR Cycle; £20 to £30; state make, etc.—Box —L1,879, c/o *The Motor Cycle*. [3458]

WANTED, Douglas crankshaft, 1911 model.—Woolleys' Garage, Pontypool, Mon. [X2966]

MOTOR Cycle, about £20; state make, etc.—Box L2,027, c/o *The Motor Cycle*. [4022]

PAIR 1912 Triumph Fork Blades, new or second.—Jenkins, Jeweller, Christchurch. [X3766]

WANTED, 1911 crankshaft, for 2½h.p. Douglas.—Shaw, 46, Spital Hill, Sheffield. [3393]

PISTONS.—Two Douglas piston castings.—Wood, 146, Lower Richmond Rd., Putney. [X3332]

GOOD Solo or Combination.—Write, 69a, Lambalt Rd., Clapham Common, S.W.4. [3864]

NEW Triumph solo, Model H.; good premium.—Catchpool, Gt. Northern Mills, Luton. [3602]

WANTED, 8h.p. combination; spot cash; no dealers.—Dodd, Thomas St., Scarborough. [X3351]

WANTED, Scotts chassis or sidcar complete.—Particulars, 91, Holles St., Grimsby. [X3638]

PREMIER 3-speed Countershaft Gear, complete.—E., 46, Wightman Rd., Harringay, N.4. [3918]

WANTED, decent 1912 Triumph, free engine; about £35.—King, Egrove Farm, Oxford. [X3616]

WANTED, lightweight; must be good condition.—16, Southdean Gardens, Southfields. [3712]

PISTON wanted for 3½h.p. twin J.A.P., 71mm. bore.—4, Whitehouse Terrace, Edinburgh. [X3318]

WANTED, A.O. Sociable.—Price and particulars to W. H. Carver, Tarrant St., Ayr. [3972]

WANTED, front cylinder, 1916 Harley-Davidson.—Rant, South Burlingham, Norwich. [X3197]

L.T. FLEMING requires a Matchless or Enfield at once.—91, Clifton Rd., S. Norwood. [3761]

N.U.T., 5-6h.p., not earlier 1914.—Particulars to Welch, 55, High Rd., Kilburn, N.W. [3792]

WANTED, 2-stroke 2-speed motor cycle.—Mines, Brightholme, Little Sutton, Cheshire. [3650]

INDIAN Spring Frame Motor Cycle, in good running order.—30, Vauxhall Walk, S.E. [2935]

ARMSTRONG or Sturmev-Archer gears or parts wanted.—Marks, 3, Shoe Lane, London. [7748]

SPEEDOMETERS and Parts, any condition; send or write.—97, Latchmere Rd., Battersea. [3127]

100 Motor Cycles Wanted, spot cash paid; bring or send, Palmer's Garage, Tooting. [0917]

DOUGLAS, Norton, or similar cycle, privately, cash waiting.—Green, Wine Merchant, Reigate. [3718]

WANTED, good solo; full particulars.—10h, Peabody Sq., Blackfriars Rd., London, S.E. [3965]

T.M.C., water-cooled with sidcar; state condition and price.—12, Wood Lane, Hucknall, Notts. [X2716]

£100 Offered for 1916 Harley combination; consider 1915.—Phillipotts, Russell St., Keighley. [X3637]

SPEEDOMETER wanted, suit 26in. wheel.—5, Mount Tamar Villas, St. Budeaux, Plymouth. [X3190]

LIGHTWEIGHT Wanted.—Phone 178 Stratford.—Write, Lient, Hull, 288, Romford Rd., E.7. [3437]

INDIAN or Harley wanted; 50 miles Birmingham.—54, Monica Rd., Small Heath, Birmingham. [X3186]

WANTED, sprocket, 14 teeth, ¾ in. pitch, 7-16 in. width.—Thomas Knox, Kilmerston, Bath. [3480]

WANTED, cylinder, piston, gudgeon pin, for 1912 Clyno.—Whele, Wireless School, Carnarvon. [X3627]

MORGAN Wanted, air or water-cooled, good condition.—Hodgson, Paragon Arcade, Hull. [X3681]

WANTED, any machine fitted with 8h.p. overhead J.A.P. engine.—Openshaw, R.A.F., Grain. [3996]

DOUGLAS, 1913, wanted, reasonable price for cash.—106, Sydney Rd., Raynes Park, S.W.19. [X3520]

WANTED, spring forks, medium, 8 in. head; deposit.—Jones, 28, Seymour St., Mountain Ash. [X3571]

WANTED, motor cycle, Morgan, combination, Ford, good price paid.—97, Sheffield Rd., Barnsley. [1236]

WANTED, 2½h.p. J.A.P. connecting rod with bushes.—N. Smith, Southlands, Scarborough. [X3225]

POWERFUL Combination; exchange screw-cutting lathe, value £60.—174, Vicarage Rd., Leyton. [3695]

WANTED, good motor cycle, lightweight or combination; spot cash.—36, King David St., London, E. [3752]

WANTED.

NEW Hudson, 2½ h.p., piston complete, 1913; Sunbeam, 1914, 3½ h.p., gear box and clutch; Triumph, 1911, adjustable pulley; sidecar, coach-built, suit 3½ h.p. Sunbeam.—10, Bruntsfield Place, Edinburgh. [X3541]

DOUGLAS, Douglas, Douglas.—Best prices paid for second-hand machines and spare parts.—Vivian Hardie, Ltd., Douglas Experts, 24, Woodstock St., off Oxford St., Bond St., London, W.1. Phone: Mayfair 6559. [0985]

PERCY and Co. require at least 100 second-hand motor cycles and combinations. Please offer us your mount. We offer exceptional high prices. We pay you cash on sight. Percy and Co., 337, Euston Rd., London. [0925]

WANTED, Indiana, B.S.A.'s, Sunbeams, Triumphs, Enfields, Harleys, A.J.S.'s, Matchless, Douglases, Zeniths: spot cash. Send particulars and price.—Wandsworth Motor Exchange, Ebner St., Wandsworth (Towar Station). [2524]

WANTED, modern motor cycle, 3½ h.p. to 4½ h.p., free engine, speeds, requiring slight repairs not objected to, or C.B. combination; cheap for cash; no dealers.—Letters, giving full particulars, price, when seen, Bray, 644, High Rd., Streatham. [3552]

J. SMITH and Co., 16, Hampstead Rd., are open to purchase any number of first-class combinations and solo machines; price no object; we want the machines; no time wasted. Communicate with us at once; write or call. We pay spot cash on sight. [3894]

WE are cash buyers of good second-hand motor cycles, not earlier than 1914 manufacture, highest prices offered, no risks in dealing with us.—Elce and Co., 15-16 Bishopsgate Av., Camomile St., E.C.3. [0551]

THE H.C. Motor Co. want motor cycles for spot cash. Highest prices given. Bring your machine to us, and compare our prices with the prices offered by other dealers.—The H.C. Motor Co., 347, Finchley Rd., N.W.3. Phone: Hampstead 4331. Open Saturday afternoons and Sundays. [5671]

SEND Your Motor Cycle to Palmer's Garage, Tooting, Wimbledon Station. Cash offer will be telegraphed immediately on receipt of machine. Machine can be included in fortnightly auction without charge if offer not accepted. Reserve price may be fixed.—Sole address, Palmer's Garage and Auction Rooms, 183-199 High St., Tooting. [0918]

EXCHANGE.

MAUDES.

MAUDES' arrange exchanges on any machines; best allowances for modern machines. See other columns for particulars.—Maudes', 103, Gt. Portland St., London, W.1. [8215]

EXCHANGE typewriter, good condition, for gent's 3-speed push cycle.—Box 4,106, c/o The Motor Cycle. [X3534]

PREMIER 1913 3½ h.p., 3 speeds, clutch; 445; take lightweight part exchange.—Box L2,024, c/o The Motor Cycle. [4019]

NEW Celluloid Rudge T.T. Handle-bars, for North Road upturned, Rudge preferred, or sell; offers.—103, Bury Rd., Hemel Hempstead. [3975]

PIANO, Cottage, walnut case, iron frame, check action, 3-panel front, inlaid; exchange for Morgan motorboat.—50, Balls Pond Rd., Islington. [3780]

EXCHANGE, portable sectional Garage, as new, 12x8, for lightweight two-stroke, cash adjustment.—Patrick, Waterden Crescent, Guildford. [X3696]

EXCHANGE 6h.p. Coachbuilt Combination, free engine, 2 speeds, perfect order, good condition for lightweight and cash.—Box 4,105, c/o The Motor Cycle. [X3534a]

45 h.p. Landanlet, splendid condition, chain drive; exchange for powerful combination or good Morgan and cash.—Lindfield, 1, Post Office Rd., Crawley, Sussex. [3758]

1915 10h.p. Humber 2-seater, water-cooled, 3-speed, lamps, etc., for good sporting combination, and cash.—The Rectory, Cockayne Hatley, Potton, Bedfordshire. [3716]

EXCHANGE, upright Piano, walnut, perfect condition, by Wilson Beck, Nottingham, for motor cycle or combination.—Adlington, Allen Rd., Pinedon, Northants. [X3660]

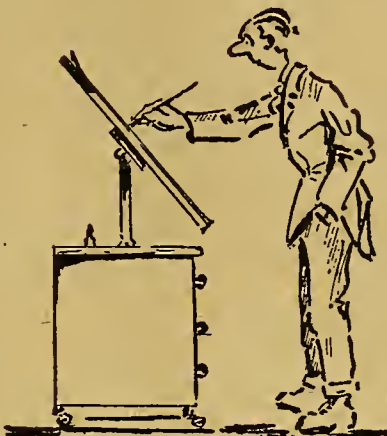
RALEIGH (Model Superb) No. 2 Push Bike, absolutely unscratched, been stored; exchange with cash for good motor cycle, or sell.—Parkinson, Bunter, Chatteris. [3612]

EXCHANGE Levis 1917 Popular, lamps, horn, tools, new oversize tyre, practically unused, for higher power, Scott or twin preferred.—Miss Wilson, Barnaby Moor, Yorks. [3616]

EXCHANGE 6h.p. N.S.U., clutch, F.E., and speeds, perfect running order, for higher power 4-cyl., P.N. preferred, clutch speeds, good running order.—33, Bridge St., Derby. [3542]

WICKER sidecar, body and chassis sound, lightweight frame, wheels, countershaft, complete, 3½ h.p. Rex engine, less cylinder; exchange lot for good torpedo sidecar; suit 2½ h.p.; or sell.—J. Harkin, Rectory, Phillack, Hayle. [X3512]

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WIDNES - LANCASHIRE.

LONGMAN BROS.,

17, Bond Street,
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AND
387, Uxbridge Rd.
ACTON.

(Telephone: 1578 Chiswick.)

AGENTS FOR:—Triumphs, Douglas, Ariels, James, B.S.A., Nortons, Enfields, Rudgets, Hendersons, and all leading makes.

We can accept a few orders for new machines and in some cases give early delivery. Call, phone, or write, letting us know your requirements.

We have a number of good, sound second-hand machines in stock, including the following:—

M.A.G. Matchless, Combination, Lucas dynamo lighting, 3-speed, all chain,	139 Gns.
M.A.G. Matchless, 3-speed, all chain, with Swan sidecar	118 Gns.
Indian, Powerplus model, 3-speed, with practically new coachbuilt sidecar	131 Gns.
Rudge-Mullis, 1916, 5-6 h.p. and coach-built sidecar	85 Gns.
Premier, 1914, 3-speed, 3½ h.p.	50 Gns.
Triumph, 1914, 3-speed	57 Gns.

WANTED.

All types of motor cycles and light cars for immediate cash. We send a representative to any part of the country to inspect and purchase upon receiving fullest particulars and price. If you live anywhere round London, phone us, and we will send straight away.

EXCHANGE.

EXCHANGE Matchless-Jap, 6h.p., T.T., clutch, kick starter, first-class condition, for 3½ h.p. combination or late solo; or sell £65; after 6.30.—4, College Gardens, Carleton Rd., N.7. [3363]

EXCHANGE Argyll Lorry, in perfect condition, 16-20h.p., 4-cyl., gate change, Zenith, Bosch, with cash for touring car, 2 or more seats, or combination; sell £150.—113, Blair St., Poplar, London. [4039]

THE H.C. Motor Co. specialise in exchange deals. We will allow you highest price for your old machine against any other new or second-hand machine in stock; machine bought for spot cash.—The H.C. Motor Co., 347, Finchley Rd., N.W.3. Phone: Hampstead 4651. Open Saturday afternoons and Sundays. [5667]

REPAIRERS.

ARMSTRONG and Sturmer-Archer Gears.

WE Regret that extreme pressure of work compels us to withdraw our regular announcement promising immediate delivery of repairs to above gears. All work will be carried out as expeditiously as possible, and will be done in strict rotation.—County Cycle and Engineering Co., 64, Staines Rd., Hounslow. [3310]

WHITTALL Machinists Co., contractors to the War Office, for all motor repairs.—Below.

WHITTALL for Welding.—Experts in aluminium, broken parts reliably welded, accurately machined, promptly returned.—Below.

WHITTALL.—Cylinders ground with guaranteed accuracy, pistons fitted; prompt, moderate. New pistons made to pattern or sketch.—Whittall Machinists Co., Whittall St., Birmingham. [0988]

FOR Best Welding Results, Super Welding Co., Gorton St., Greengate, Salford, Manchester. [2332]

ENGINE Repairs.—Write us, Nelson and Hardie, Motor Engineers, Leam St., Leamington. [X3759]

ENGINE Repairs. Write us.—Nelson and Hardie, Motor Engineers, Leam St., Leamington. [X3180]

WELDING Broken Cylinders, flanges, combustion heads; immediate attention; reasonable prices.—Below.

WELDING Aluminium Crank Cases, gear boxes, by experts of 11 years' experience.—Below.

CYLINDER Grinding on latest machinery installed since hostilities ceased; accuracy guaranteed; new pistons fitted.—Sadgrove and Co., 140, Conybere St., Birmingham. [X0803]

TRIUMPH Spare Parts and Repairs.—Try the promptest firm, Forfield Motors, Forfield Place, Leamington Spa. [X3770]

DON'T Wait, we can undertake repairs, replacements, and overhauls at once, trade or private.—Central Garage, Hunstanton. [3058]

CENTRAL Motors (Oldham), Ltd., undertake to thoroughly overhaul and repair any make of motor cycle.—Below.

BROKEN Frames, forks, crank cases, connecting rods, pistons, cylinders, etc., etc., welded by the process of oxy-acetylene. Send your enquiries. All work guaranteed.—Below.

WE Repair all makes of gear boxes, N.S.U. gears, etc. All repairs promptly attended to.—185A, Huddersfield Rd., Oldham. [X0390]

FRAME, chassis, and tank repairs, enamelling and plating, by experts; prompt deliveries.—Langham Co., Fitzroy St., Leicester. [2536]

FOSTER, of 170, Cardigan Rd., Leeds, is again at your service, and can undertake any class of welding and machine work.

CYLINDER Grinding and Piston Making is with us a speciality. We shall be glad to have your enquiries.—Foster, Leeds.

PISTONS.—We specialise in the manufacture of special aluminium alloy pistons, in hundreds of odd ones.—Foster, Leeds. [0310]

CYLINDER Grinding Unnecessary; compression restored; fit our rings; send piston and cylinder; half cost; certain cure.—Below.

PISTON Rings, high grade; low price; standard or oversize.—Patent Rings, 30, Wigan Rd., Atherton. [6575]

WE are prepared to undertake high-class machining for the trade; anything within the capacity of 8½ in. lathes.—Box L1,970, c/o The Motor Cycle. [3517]

PAINTING, body building, conversions, hoods and screens to clients' requirements, quick deliveries; quotations with pleasure.—Palmer's Garage, Tooting. [4571]

FRAME Repairs and Alterations.—Special frames and tanks built, any designs; enamelling and plating.—A. Pilkington and Co., 390, Lichfield Rd., Birmingham. [2583]

WELDING.—Broken cylinders, pistons, connecting rods; cylinders reholed, new pistons and rings.—A. Pilkington and Co., 390, Lichfield Rd., Birmingham. [2582]

GROVER, Smith, and Willis, Basingstoke.—We do all classes of machining; if you cannot get spare parts send us your enquiry; repairs of every description. [6264]

REPAIRERS.

TONGE Welding Co., Morton St., Middleton, Manchester.—Again at your service. Send that broken cylinder or crank case. Certain to please you. Quick return. [X2532]

STURMEY or **Armstrong** Gears and Premier free engine hubs; repairs executed or parts supplied promptly.—The Rotary Joining Co., Regent St., Warrington. [X9447]

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RENOULD, Brampton, Coventry chains, 1/2x3-16, 1/2x4, 5/8x4, 3/4x4, 3/4x7-16; Dunlop 1919 standard covers, heavy, 24x2 42/-, 26x2 43x9, 26x2 47/3, 26x2 41/9, 28x2 67/9, 28x3 70/3, extra heavy ditto, 26x2 63/3; inner tubes, 8/6, 8/9, 10/3, 11/3, 11/9, 13/3; Douglas T.T. bars, 18/6; Brooks saddles, 37/6; King Dick pat. spanners, 7/6; rubber grips, 4/3; racing helmets, tan leather, with ear roll, 15/6; electric horns, 42/-; Helleson flash batteries, 14/6; Dunlop and Paddy belts, 3/4in. 7/6in. 1in. 1 1/2in.; piston rings, all sizes, 60 to 80 mm., best make, 2/6 each; tubular box spanners, in sets, 2/9, 5/9, 7/9; bulb horns, 15/6, 18/6, 21/-, 25/-; accumulators, 4 volt 20 amps, 27/6, 40 amps 35/-; electric bulbs, all sizes, 2 to 12 volt, S.B.C., 2/6 each; rims, 26x2 1/2, plated, drilled 32 holes, 10/9.—Phone, write, or call. 8.30 to 7. Wednesdays close 1, Saturdays 8 p.m. Country orders despatched per return.

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100 Motor Cycle Crates; 10/6 each.—Wauchope's, 9, Shoe Lane, London, E.C. [X3274]

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TRIUMPH 1913 Tank, grey, no leaks; 15/-, packed.—75, St. Danstan's Crescent, Worcester. [X3565]

JONES Speedometer and Drive, reset trip counter; 50/-.—Curtis, 2, Mount St., Manchester. [X3210]

SMITH'S Trip Speedometer, complete with drive, 26in.; 30/-.—Ewens 15, Carver Rd., Herne Hill, London. [X3376]

N.S.U. 2-speed Gear, fit 1907 Triumph, good condition.—Maitland, Minlaw Station, Aberdeenshire. [X3521]

TRIUMPH Carburetter, complete with controls; £1.—Leeming, 87, Skipton Rd., Colne, Lancs. [X3693]

FRAME and Rigid Fork, will take large tank £1, carriage paid.—133, Northfield Rd., Coventry. [X3227]

MAGNETO, 45° twin Bosch, Millennium Fit-all 2-speed gear; what offers?—1, Vicarage Rd., Stockport. [X3333]

TWELVE New Files, 3 to 10ins.; 5/6; approval.—Mechanical Supplies, 24, Leytonstone Rd., Stratford. [X3485]

WATFORD Speedometer, trip and mileage recorder, perfect, complete; £3/10.—F. Holmes, Chellaston, Derby. [X3348]

MINERVA—Large stock of spares; no cylinders.—Cookson Bros. and Harrison, Wright St., Old Trafford. [X3787]

MISCELLANEOUS.

NEW 1915 Frame and Wheels, Druid forks, what offers; also twin Dixie mag.—43, Ludbrooke Rd. Redhill. [X3707]

DOUGLAS Frame, forks, handle-bars, tank, and wheels; £4/10 the lot.—1, Post Office Rd., Crawley, Sussex. [X3756]

BINKS 3-jet Carburetter, with controls, spare jets, for 3½ h.p.; 35/-; Attree, 51, Stanmore Rd., Stevenage. [X3472]

PILLION Seats, unused.—Tynesider, with spring attachment, 35/-; V.M., 32/6.—101, Wellesley Rd., Ilford. [X3676]

OFFERS Wanted.—Chater-Lea 3-speed gear box, perfect condition.—Hacker, 87, Keith Lucas Rd., Cove, Hants. [X3579]

STURMEY-ARCHER 3-speed Hub, J.S., in perfect order; £10.—Matthews, 177, Canterbury Rd., West Kilburn. [X3735]

50 NUTS, Screws, Washers (assorted), 2/6, post free; send for list.—Eric Meadows, Backfield Lane, Southport. [X3928]

LUCAS Dynamo, 12 volts 20 amps., complete with cut-out, brand new, suit car; £10.—44, Albert Rd., Plymouth. [X3206]

72 SPRING Washers, 3-16 to ½, 1/6; 3/6 castle nuts, 1/2 to 1/6; carriage paid.—Wood, 38, Tithebarn St., Preston. [X3015]

N.S.U. Gear, adjustable pulley, locking nut, done less than 100 miles; £6.—Thomas, 14, Cowper Rd., Redland, Bristol. [X3591]

DUNLOP 110, Belt, new, 15/6; Whittle 5½ in. belt, 13/-; round metal belt and tube case, 4/-; Sayse, Clerkenleap, Worcester. [X3256]

CHATER-LEA Gear box, 2-speed, chain and sprockets; £3/17/6; after 6 p.m.—W., 29, Tettcott Rd., Chelsea, S.W. [X3442]

TAIL Lamp 10½, side lamps 42½, pair brand new; goods approval against remittance; post free.—Palmer's Garage, Tooting. [X6831]

STURMEY 3-speed Wheel and Pedalling Gear, perfect; £12/10; all controls.—Stock, 107, Coningham Rd., Shepherd's Bush, W. [X3917]

TRIUMPH 1912 Cylinder and Piston, sound, £2; 2 belts, 11s. and 7½ in. 7½ in. long, 10/6.—32, Grove Rd., Leytonstone, Essex. [X3473]

REX Back and Front Wheels, belt-driven, covers and tubes, excellent condition; back 30/-, front 25/-.—57, Mill Hill Rd., Acton, W.3. [X3848]

TRIUMPH Frame, 1911 pattern, new, £4/10.—Wheelon, Leamington Sidecar Works, 41a, Regent Gate, Leamington Spa. [X3518]

VALVES complete, Triumph 4 h.p., 2 exhaust, 1 inlet, 1 3/4" Triumph exhaust; offer for same.—54, Gloucester St., Victoria, S.W.1. [X3528]

COWEY Speedometer, 60 miles, nearly new, 26in. wheel, £3; two butt-end tubes, 26x2½, new, 6/- each.—27, Peldon Ave., Richmond. [X4037]

21 Secures.—3½ h.p. motor cycle, spring forks, Sen-spray carburetter, mag., too cheap for approval, carriage paid passenger train.—Below.

3-4 h.p. Motor Cycle, Bosch mag., B. and B. carburetter, machine like new; first letter or wire convincing offer or cash over £26 secures, a great bargain; no cheques; cannot give approval at this price.—Food, 12, Stewart St., Seaham Harbour, Durham. [X3677]

FRAME, Chater-Lea pattern, complete less engine, B. Drum heavy forks, 26x2½ wheels, tyres new; what offers?—1, Vicarage Rd., Stockport. [X3334]

3 h.p. Mianva being dismantled; write me your requirements; all parts in good condition.—Rose and Crown Garage, King's Langley, Herts. [X3409]

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N.S.U. Gear, off Bradbury, excellent condition, £4; also sidcar, new coachbuilt body, and heavy Dunlop tyre, £7.—22, Drummond Rd., Romford. [X3890]

DISCS, aluminium, seamless, 26x2½ wheels only, set four 3 gns.; packing, carriage extra; lightest, smartest.—Railway Garage, Staines. Phone 139. [X4005]

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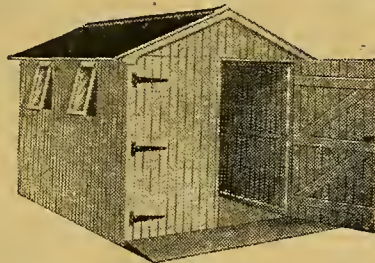
REYNOLDS Roller Chain, 6ft. 6in. x 1in. x 3/16 in. £1; wasted, 1911 2½ h.p. Douglas, crankshaft.—Fair View, Candlesmas Lane, Beaconsfield, Bucks. [X3603]

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In my dream I always seem
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But with Spring upon the wing,
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With a CHAIRMAN too.
5½d. for 10 everywhere.*

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7-9 h.p. Indian Cylinder and Piston, as new, £3/10; brand new 3½ h.p. B.S.A. cylinder and piston, £4/5; 1915 Triumph cylinder, perfect, £2/5.—Below.

LUCAS Dynamo Lighting Set, complete, £21; Lucas lamp set, acetylene, £2/15; B. and B. carburetter, pilot jet, £2; Seaspray heavyweight, 32/6; B. and B., single jet, £1.—Below.

28x3 Heavy Studded Cover, new clearance, £27/6; 26x2½ W.E. cover, 6/-; Triumph front fork conversion set, £1; 1912 Triumph tank; 1912 Triumph frame, damaged, 16/-.—Below.

1911 Triumph Tank, 28/6; brand new lightweight Druids, £1; magneto control lever, 4/6; brand new pannier bags, 10/6 pair; S.H., 6/- pair; all accessories.—Syd. Pearson, Gato House, Chesham, Bucks. [X3774]

C.A.V. Magneto, single, anti, £3/10; Bosch, off 4-cyl. F.N., £5/10; F.N. spring forks, £1/10; all parts of 1910 4-cyl. F.N., cheap.—Wm. Gill, Grindelford, near Sheffield. [X3784]

BOSCH Twin Waterproof ZEV, £8; Amac carburetter, 30/-; cane canoe sidcar, £6; spares for Peugeot and A.C., cheap.—F.B., 48, Watney St., Stepney, E.1. [X3786]

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BROWN Army Canvas Shoes, leather soles, 2/-; 2/6; Canadiana white canvas shoes, leather soles, 3/6; 4/6; army boots, 9/-; catalogue free.—Gould, 47, Abbey Place, Plymouth. [X1995]

TANKS, Leg-nards, Disc Wheels, made to order; repairs a speciality; general sheet and metal work; enamelling.—Coombe Manufacturing Co., 121a, Much Park St., Coventry. [X2435]

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TOP Half Crank Case, camshaft, frame, and forks (a few parts missing), piston, back hub and bevel, new tank, rims, for 4-cyl. F.N.—C. Berard, Jacques Court, Elham, Canterbury. [X5642]

SCREW-CUTTING and Surfacing Power Lathe, 7in. centre, 66in. gap bed, complete set wheels, chuck, face plate, carrier, little used, 50/-; wanted, 4-cyl. light car.—G. H. Taylor, Spath, Utteter. [X3502]

PAIR Indian Cylinders, new, £2/10; Dixie magneto, for Indian, £3/15; Indian gear box case, 10/-; Rex cylinder, 1914, 30/-; Rex spring forks, complete, 25/-; Hole, 129, Park Lane, Carshalton. [X3774]

100,000 Shop-soiled and Second-hand Files, 6in. 16in., genuine salvage stock, all guaranteed usable. Send 12/6 for 3 dozen assorted, carriage paid; approval.—Palmer's Garage, Tooting, S.W. [X1629]

UNBREAKABLE Chrome Nickel Valves, guaranteed one year, any pattern, 6/- each, 10/- pair; step-cut piston rings, 4/- pair, post free per return.—Capacity Tool Co., Broseley, Shropshire. [X2291]

LAMPS.—Lucas 462 set, 55/-; C.A.V. three electric and battery, 50/-; two H. and B. brass cycle car and generator, 50/-; oil tail lamp, 3/-; Klaxon horn, 28/-; sidcar apron, 6/-.—1, Aspley Villas, Acton. [X3487]

DIXIE Magneto, twin, £3/10; Hille compressor, 15/-; A.J.S. 2½ h.p. clutch with kick starter ratchet, 15/-; chain case, new, £3/10; drum brake with sprocket, new, £1.—33, Alexandra Av., Southall. [X3703]

LADY'S Cycle, by G. Rodgers, Leeds, bought June 8th, 1919, cost £18, fitted Sturmeys-Archer 3-speed tri-coaster; accept £12 cash.—Amy Micklethwaite, New Brighton, Dene Dale, Huddersfield. [X4007]

PISTON Riags, Triumph, Rudge, Precision, Villiers, J.A.P. Sunbeam, James, 2/3 each; Enfield, Douglas, Lewis, 2/- each; in stock.—Lifford Accessories Co., 10a, Guildhall Buildings, Navigation St., Birmingham. [X3623]

HOLAX Petrolproof Bright Black Enamel gives a finish equal to stove enamelling; 1/- per gal., 1/10 per tin, postage 3d. extra; trade supplied.—C. A. Holland and Co., 36, Giesbach Rd., London, N.19. [X3998]

FRAME, with 26x2 wheels, tyres good, handle bars, saddle, brass tank, coil, 2 volt 40 amp.-hour new accumulator, B. and B. carburetter, 7½ in. 7½ in. Pedley belt; £6 the lot.—Layton, Beurow, Wallingford. [X3570]

DROPPED Back Frame, tank, Saxos spring forks, mudguards, saddle, carrier, and oil pump, suit 3½ h.p., and 3-speed hub; £6; cash returned if sold.—Nicholson, 4, Cavendish Rd., Stretford, near Manchester. [X3542]

RELIANCE Company, the Typewriter people, buy, sell, hire, and exchange all kinds of typewriters; they trade in reliable goods only, and have built their extensive business on the small profit and quick turnover basis. Machines sent on approval, get list.—Reliance House, Tram Terminus, Holborn. Phone 2388. [X3999]

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GEARS, Grado, with controls, 50/-; Douglas 2-speed box, kick start fitting, latter missing, £5; two Douglas carburettors, one with controls, for 25/-; accept £8 the lot.—Pallin, Fruiterer, 68, North St., Westminster, Bristol. [X3347]

MABON Countershaft Gear and free, 70/-; 1914 Amac, 20/-; Brooks large saddle, as new, 25/-; aluminium spring footboards, 15/-; spring saddle pillar, as new, 10/-; all in excellent order.—Gurry, Fen Ditton, Cambridge. [3423]

ENFIELD Hood and Screen, 45/-; Triumph valve, 4/6; 6ft. x 7/16 Dunlop belt, 5/-; Garner whistle, 5/-; spare tank (new), 5/6; toolbag, 4/-; E.I.C. contact breaker, 15/-.—4, Thornton St., Kennington, Bedford. [X3470]

NEW Douglas Belt, 7/-; generator, 7/-; lamp set, £1; single-cyl. Bosch magneto, £3; twin, less contact breaker, waterproof, £3; 4-cyl. Studebaker magneto, £4/10.—Wright, Tunnel Garage, Albert St., Poplar, London. [4040]

MAGNETO, Bosch twin ZEV, as new, offers; another Bosch twin, £3/10; two frames, 30/- each; Moto-Reve, complete, less mag., £11; A.F. engine, 3 1/2 h.p., with carburetter, £4.—S. A. Waghorn, 65, Burnt Ash Rd., Lee, S.E.12. [3744]

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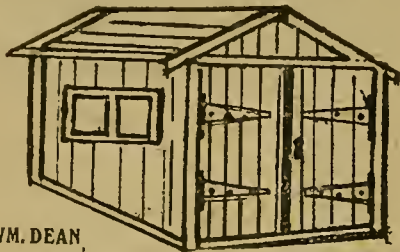
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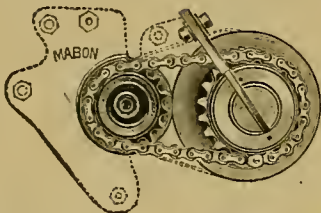
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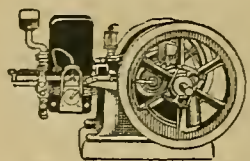
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Consumption Tests.

IN their endeavour to find interesting competitions for club events, and methods of determining the winner in reliability trials, club secretaries will very likely institute fuel consumption tests. These tests are in themselves very valuable, provided that they are carefully carried out, and the ton miles per gallon might well be made the decisive factor when a cup winner has to be chosen from a number of gold medallists.

It has, however, been pointed out to us by a correspondent well known in the motor cycle world that competition officials when running trials of this nature should pay very special attention to the oil tanks of two-stroke motor cycles; for, if the oil tank be filled with a petrol mixture, it is possible for the machine to be run without any petrol passing through the carburetter. Almost phenomenally small apparent petrol consumption has been actually obtained, he says, by this means, where the consumption figure has been determined by the amount used from the legitimate tank.

We should be the last to suggest that there are many motor cyclists who would descend to such fraudulent practice; still, it is unfortunately a fact that such things are sometimes done, and it is most desirable, from all points of view, that a good performance in a fuel consumption test—as in a speed test or hill-climb—should be absolutely free from all suspicion of trickery. It has in the past been difficult occasionally to accept anything very unusual in fuel consumption figures, owing to the methods adopted for measuring the amount of fuel used, which have not always lent themselves to the extreme accuracy necessary for such tests over short distances. One method, for instance, is to fill the tanks at the start, and again at the finish, noting the amount of petrol required on the second occasion. In this case a slight tilting on uneven ground may make a very real difference to the result. A better plan would be to

empty the carburetters by running the engines and disconnecting the usual petrol pipe, attaching instead a small tank containing a carefully measured supply of fuel, and then run the machine to a standstill under observation. This method leaves very little room for error, but entails a certain amount of trouble and the provision of suitable auxiliary tanks.

Ease of Cleaning.

OVER and over again *The Motor Cycle* has urged the great desirability of making a motor cycle in such a manner that it can be washed down with a hose in the same way as a car is cleaned. We have shown designs of self-contained units from which nothing projected but a chain sprocket and the necessary control rods and wires. Even the sprocket can be covered in by a suitable chain case, or, if shaft drive be employed, it is a simple matter to make the transmission proof against mud and water. The same can be said for the bearings and other cycle parts.

The present-day motor cycle is a mass of corners and crevices, all of which mean a considerable amount of trouble in cleaning. Without going so far as the self-contained unit with a smooth exterior (this if carried to extreme limits would probably entail water-cooling), much might be done to render the labour of cleaning less wearisome by making the outsides of the crank case, gear box, etc., as free as possible from angles and projections, and by removing all superfluous lettering, which, while looking well enough when clean, harbours a quantity of dirt—dust and oil mixture in summer and mud in winter.

The complete frame and all small cycle parts should be treated by some rust-preventing process, and stainless steel used for all nuts that are exposed to the elements. We should then have machines which would be slow to show the ravages of time, and whose appearance would be a credit to manufacturer and owner alike.

A STRENUOUS WEEK-END.

A Combination of Reliability Trials.

THREE competitors in the London-Edinburgh Run went through the Liverpool M.C. Trial on Whit-Monday. These were Gordon Fletcher (4 Douglas sc.), Rex Mundy (8 Matchless), and A. G. Cocks (2½ Clyno). Fletcher carried his wife as a passenger, and when we saw the pair at the conclusion of their strenuous week-end, they appeared very little the worse for their several nights in the open.

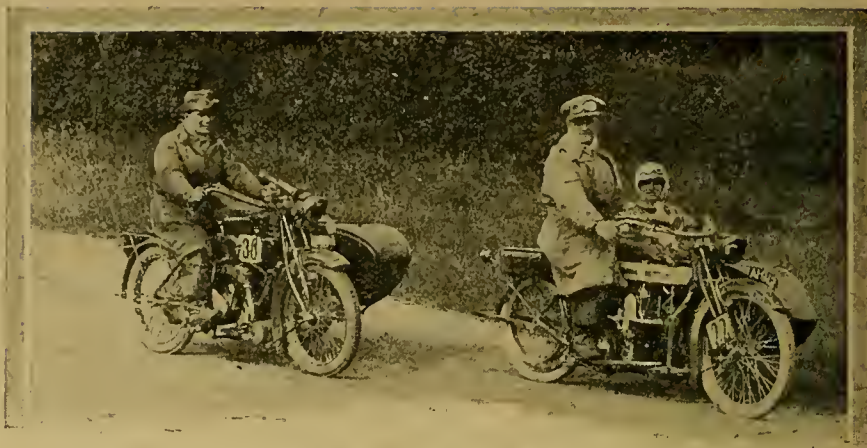
Fletcher's "adventure" began by having to ride his Douglas from Bristol in the night three evenings before the start of the London-Edinburgh. The next evening he went to Eastbourne and back to fetch Mrs. Fletcher, and the whole of the following night was used preparing for the event.

The scooter which had created so much amusement at Highgate was seen *en route* on the running board of a Sunbeam car, to which it acted as a kind of tender.

At Grantham, Mundy bought, for 1s. 6d., some coupons which were supposed to admit him to the refreshment caterers. These, however, proved to be valueless, and the vendor had disappeared. Mundy carried the joke a point further by reselling the tickets to a fellow competitor for 2s.

Between York and Carlisle, eye troubles were fairly general, and Mundy was compelled to stop every few miles to bathe his eyes at wayside cottages.

A Harley-Davidson was passed on the roadside, and it was evident, from its condition, that the driver had fallen asleep and driven into the ditch. Thompson (Douglas) rendered assistance, and carried the competitor's A.C.U. "get-you-home" coupon to Appleby, where he arranged for a lorry to fetch in the machine. At Edinburgh, Mundy's pas-



Rex Mundy (8 h.p. Matchless sidecar) and Mr. and Mrs. Gordon Fletcher (4 h.p. Douglas sidecar), who competed in both the London-Edinburgh run and the Liverpool M.C. trial in North Wales—a strenuous week end.

senger preferred to camp out rather than to find accommodation at the hotels, and Mundy was not able to find him for the trip to Liverpool.

Fletcher and Mundy, with their sidecars detached, caught the 4.55 train out of Edinburgh. Sunday travelling by train proved very trying, but after several changes they arrived at Warrington at eleven o'clock, where they were met by J. Swinton, an energetic member of the Liverpool club, who, notwithstanding having to get back to Warrington and to start in the trial next morning from Queensferry, piloted them for ten miles or more on to the best road for Chester.

Swinton also provided benzole, and for the wholehearted manner with which he rendered service was voted a "good sport." It was now raining hard, and arriving in Chester at 2.30 a.m. the party went to an hotel, where they were treated well, although no beds were available. It was too early for breakfast when they left for the start of the Liverpool trial, but this did not seem to disturb any of the enthusiasts, including Mrs. Fletcher, who, by the way, is an old hand in competitions.

Before her marriage she was Miss Hamnett, by which name many of our older readers will recall her.

The Matchless and Douglas were now taken through the Welsh trial, but owing to the use of benzole without retuning the carburetters the engines of all the machines in the trial showed signs of overheating.

Tuesday was spent by Mundy on business for the A.C.U., of which he is the engineer and travelling representative, and a start was made for London in the evening.

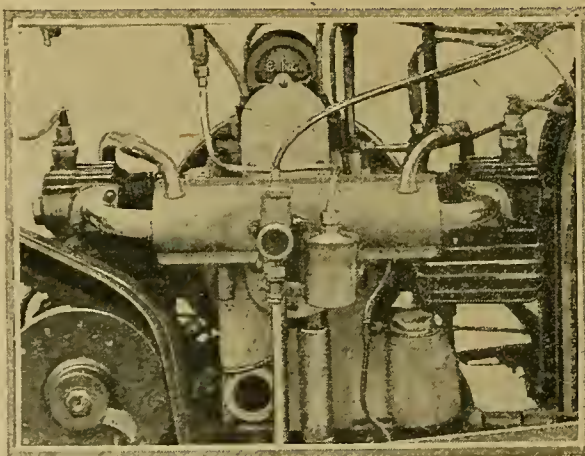
At four o'clock on Wednesday morning a puncture in Fletcher's rear wheel caused the party to stop, and, instead of mending it, the two men lay down on the roadside and journeyed to the land of dreams.

At 6 a.m. Mrs. Fletcher shamed them by waking them with the intimation that she had mended the puncture and arranged for breakfast at a cottage a little distance down the road.

Then the final stage of the journey was completed—a mere 150 miles or so, making a total of 800 miles. A strenuous week-end indeed!

HEATING THE INDUCTION PIPE.

IT is very desirable that a motor cycle engine should tick over when standing in the same manner as a car engine, especially if a sidecar be fitted, but this ideal is not often attained. Last week, however, we saw an engine that left nothing to be desired in this direction, the result being attained by means of a B. and B. pilot-jet carburetter and an exhaust heated induction pipe. The motor cycle was a 4 h.p. Douglas, used for experimental purposes by Messrs. Brown and Barlow, Ltd., and, while it was standing in the street with the engine running, it was quite easy to count the revolutions of the engine by watching the operation of the valves. We estimated that we counted the valve movement at the rate of 120 per minute, which gives 240 r.p.m., or about 3½ m.p.h. on top gear. On low gear



A special heating arrangement on the induction pipe of a 4 h.p. Douglas. This device has proved exceptionally satisfactory.

the machine would literally crawl. It was impossible to count the explosions in the street for the simple fact that one could not hear them. We were informed that the machine was capable of upwards of 50 m.p.h.

This wonderful slow running is achieved by preventing any condensation in the inlet pipe. If condensation is allowed to occur petrol accumulates, which presently finds its way to the engine and makes the mixture unduly rich. Opening the extra air port corrects this, but a moment or so later the accumulation of petrol is used up, the mixture becomes too weak, and the air must be again closed, and so on.

A similar fitment has proved equally beneficial to the water-cooled M.A.G. engine of a Morgan Runabout—in this case the induction pipe is warmed by the water.



The Buckboard Redivivus.

MOTOR cyclists, virile and technical alike, view Mr. Grahame White's new Auto-wheel buckboard with that kind of dismay which is akin both to amusement and contempt. The sensations with which they inspected the first scooter were renewed. I submit with all deference that, though neither of these newcomers thrills the marrows of a sturdy competition rider, yet they deserve a warm welcome from the most expert of us. Our sport and industry have been dominated and cramped from the outset by the fear-nothing, hard-riding type of owner. There are millions of would-be motor cyclists who are too timid to ride standard machines. The three features of motor cycling which fend off lots of women and quite a few men are speed, weight, and sideslip. Ignorance being bliss, it was far easier to start riding twenty years ago than it is to-day; for the puny Werners of that age were hard put to it to exceed 25 m.p.h., whereas the fiery monsters of to-day bear a nervy girl off down the road at 40 m.p.h., if her sleeve catches the throttle lever. (The scooter and the buckboard will run at 4 m.p.h.) Similarly, most of us have forgotten how we regarded the first motor cycle we ever tried to wheel, and what an abomination it seemed when we incautiously let its two-four hundredweight lean away from us (the scooter weighs fifty-sixty pounds, and the buckboard stands up all by itself—*ergo*, from a practical point of view, it has no weight). I should not be surprised if scooter-skids do not prove more lurid than some people imagine; their little front wheels steer very rapidly indeed, and if one of them did a real lightning lie-down, I fancy the passenger would be converted into a projectile with considerable lateral velocity. That remains to be proved, but the buckboard is skidproof. If it should pirouette round on grease till it is lost in its own blur, the rider would be none the worse, and there is neither height nor speed to render the tumble serious. This quaint pair of bantlings between them offers just what plenty of people who funk ordinary machines have been pining for. As such, we owe them a welcome: and I quite expect them to beget a numerous and creditable progeny.

Not Ambitious Enough.

INDEED, my main criticism of the G.W. buckboard is that it is too cheap. I have no doubt its price will widen its appeal, and I hope to purchase one for my son and heir to drive round the back garden until I can convince the local police that he has attained a licenceable age. But if my own nerve collapsed, so that I dare not venture forth with two wheels upon grease, I should desire a nobler vehicle than this rockbottom of simplicity. I should want more speed and power, not to mention a variable gear, for no Auto-wheel could approach my house by road except with a G. A. Olley doing l.p.a. over it.

Although controversialists in this journal besmirch my technical credit, I am too much of a mechanic to love a clutch which consists of slipping my back tyre on the 'ard, 'igh road. In other words, I want an altogether more ambitious buckboard; and two little birds at least whisper to me that my desires may not pass ungratified when I get a little more doddery, and the fireside begins to grip me in winter. Nevertheless, what am I but a hardened motor cycle maniac? It is not for such as me that the scooter and the auto-wheel buckboard have been begotten. The days may come when loving youngsters will present dear old Grandpapa Ixion with one or the other on his seventieth birthday—ugh!

Amateurs and Shamateurs.

MR. Leatherbarrow's suggestions for the Six Days Trial will probably command fairly general assent from the riding world. It is questionable whether either the trade or the expert (and largely honorary) administrative staff will welcome two separate events (passenger and solo). He omits the profoundly vital question of "finishing condition." I consider it bad policy to limit emergency gear ratios. All club committees will be grateful if Mr. Leatherbarrow can help them to identify the pukka amateur. The best definition I know is that a man should be employed full time at a job which is not directly or indirectly connected with the motor industry; but this presses rather hardly on two types of owner, viz., the moneyed idler and the apprentice at, e.g., a steel works, who may be the purest of amateur motor cyclists, although he is a professional engineer.

Gear Ratios in Trials.

I AM going to enlarge on this topic, because the suggestion strikes me as fundamentally unsound. It is merely the freak hill stunt in a new guise. Threatened with excessive bills for gold medals and the problem of finding winners for special prizes, the A.C.U. in a moment of intellectual stupor began to send the competitors up goat tracks which no rational person exceeding eighteen years of age would ascend in a state of sobriety. For a moment riders were stumped; but by the next year they downed the promoters with the aid of 18 to 1 gears and similar absurdities. The A.C.U. countered by utilising Porlock when smeared with a foot of mud equivalent to soft soap, by hunting for avalanches of sliding scree and other comicalities. If the process continues, we shall see the 1925 trials climbing trees on bottom gears of 30 to 1, and aided by balloons inflated with exhaust gases. So far as a guarantee of hill-climbing goes, the public needs nothing more convincing than an ascent of a hill like Sutton Bank at a minimum speed of 20 m.p.h. on the last day of the trial. Freak hills, river beds, and 18 to 1 gears are tantamount to a con-

Occasional Comments.—

fession of incompetence on the part of the promoters, who have to find winners somehow, who do not want to make their gold medals too cheap, and who can ill-afford to award golds to 99% of the entry. I shall be very disappointed if the new committee do not devise a more excellent way; and I feel sure the job may safely be left in their hands.

A Reminiscence.

THE scenes on Porlock Hill in the 1912 A.C.U. trial were a veritable *reductio ad absurdum* of the ill-conceived policy attacked in my last paragraph. On the Friday night an excessive proportion of the entry had qualified for golds, the judges were in difficulties as to the allotting of several special awards, and much rain had fallen. A technical mission was despatched to Porlock to discover if the hill was rideable. None of the messengers made a clean ascent—speaking from memory, I fancy that only one got up, and he utilised the instalment system; the telephoned report was to the effect that dozens of motorists had vainly essayed the climb during the day, a hill-climb would prove a sheer lottery, and very few riders would get up without dropping marks. This was exactly what the judges required, so on the Saturday morning the competitors were duly despatched *via* Porlock. No fewer than *fifty-two* men lost upwards of fifty marks on the hill, whilst *twenty-eight* slithered up unpenalised. The fifty-two culprits included crack riders like Sirrett, B. A. Hill, H. Greaves, J. S. Holroyd, W. F. Newsome, P. Phillips, F. Sangster, two of the Scott team, S. Sawyer, the brothers Dixon, Reg. Holloway, Haslam and Griffiths on Zeniths, W. B. Gibb, Rex Mundy, Hugh Gibson, Charlie Collier, and many others. Of these fifty-two unfortunates, twenty-six had not previously dropped a solitary hill-climbing mark. Mr. Leatherbarrow's suggestion of minimum bottom gear ratios, if adopted in any trial, would merely put the entire entry at the mercy of incompetent committees, whose evil purposes would then be served by hills far more climbable than Porlock is after a week's rain. I hastily add that I was not one of the victims on this historic and humorous occasion, so that I write without malice. As "Veteran" recently reminds us, certain Scottish judges once adopted an even more cynical expedient, when on the last day of a long trial they sent the entry up the "back stairs" of Amulree.

The Tail Lamp Famine.

FOR some mysterious reason, the scarcity of such commodities as whisky, beer, Bolo majors, English beef, £50 1919 motor cycles, and dwelling-houses is a veritable superabundance as compared with the famine in motor cycle tail lamps. Some nimble-fingered gentleman of the road stole mine the other day, and I have tried all the leading London and provincial houses without meeting anything but derision from the salesmen. If they are truthful, there has not been a motor cycle tail lamp delivered since the Armistice. I have even endeavoured to buy one tenth-hand, proffering its weight in gold, but to no purpose. I have essayed to steal one, as people do when their umbrella is taken "by mistake," but tourists appear to detach these fittings, and go to bed with them. I have a car tail lamp in my garage, so, gentle reader, if you meet a Baby Levis purring through the twilight with a 12in. paraffin Dependence tail lamp secured on its carrier by eight yards of barbed wire, you will know that you have caught one fleeting glimpse of that elusive pseudonym "Ixion." Have the Huns nefariously got their own back on us by cornering the world's output?

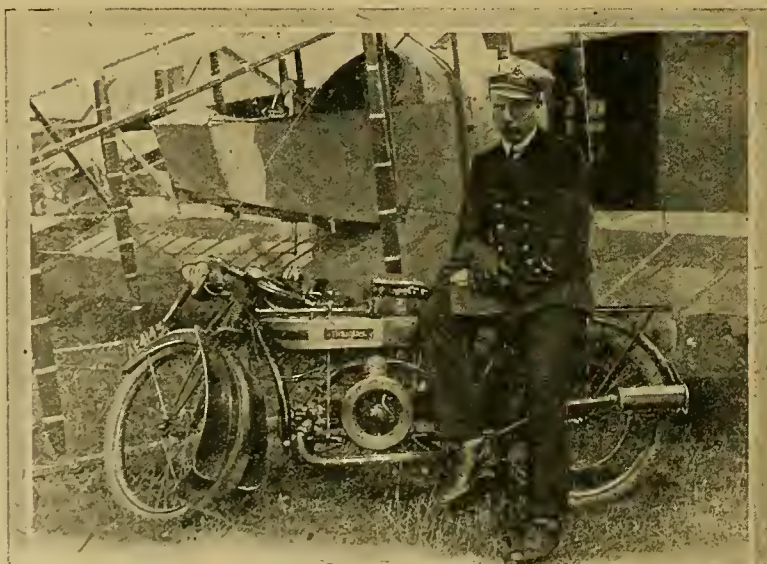
A Ready Mind.

THE other day a trade rider, testing a new flat twin, emerged from a door, wiped his lips, and endeavoured to start the engine. Two demobilised officers (of the strong, silent type) had been inspecting the machine whilst the owner was lubricating himself. "Excuse me, sir," quoth the ex-major, stiffly, "but are you aware that your flywheel is running out of truth?" (Was he not? But trade riders engaged in testing experimental mounts must give nothing away.) "Not untrue, sir," he remarked, politely, "this is our new patent eccentric flywheel. It is formed with a counterbalance timed to help each piston over top dead centre. Good-day, gentlemen." And the astute one was off before the military could cross-examine him.

A good lie. But mark the sequel, for Nemesis doth dog him of unscrupulous speech. The Great Panjandrum himself did summon the trembling tester.

"Hey, Bilkins, what the — is this?"

"This" was a polite letter from a gentleman who appended the title "major" to his signature, humbly enquiring whether "your new patent eccentric flywheel which your tester showed me on the Leamington road the other day" was applicable to the 1913 model.



Capt. Sir John Alcock, D.S.C. (who, with Lt. Sir A. Whitten Brown as navigator) is the first and only airman to make a direct flight across the Atlantic. He is depicted above with his overhead valve racing Douglas

MY HOLIDAY—AND YOURS.

By D.C.H.

There are holidays which stand out in one's memory as being immeasurably more enjoyable than others. You can be sure of the "splendid holiday" wherever and whenever you may be going—if you take the right companions along with you.

I have just returned from the finest holiday I have ever spent, although, strangely enough, my companions were silent throughout its duration.

Nevertheless, these silent friends enabled me to bring back with me more pictures than the finest Kodak has ever taken. And the pictures are permanent—indelible impressions that will be with me for life.

Previous holidays had always been a combination of hectic amusement and bottomless boredom. Before leaving for this one I had argued to myself this way: "Always before there have been certain hours in my holidays that have hung heavily on my hands. What had I done with them? Nothing, or next door to it." I had lazed them away—dozing on the beach or in the garden. I supposed it was the only thing to do with them. Was I not on holiday?

A short time before this memorable holiday, several friends had been talking to me about Pelmanism, and the thought suddenly struck me: "Why not enrol before going off, and take these 'little grey books' everyone is talking about along with me as holiday companions?"

I did it—not without hesitation. I had always believed—fallaciously believed—that a real holiday should be a complete rest. No newspapers, no work, and no more thinking than necessary. I had never before paused to realise that, although the body may need rest, the mind needs change of thought—*mental* rest.

THE BEST COMPANION.

Don't run away with the idea that I sat studying the "little grey books" all day long, though. Not a bit of it. Pelmanism is not a tyrannous study. I bathed, played golf, tennis, and did all the other things one does when holiday-making. Then, in the cool of the evening, I used to slip one of the "little grey books" into my pocket, and stroll down to the beach, or into the garden, and there, at ease and peace with the world, I revelled in its fascinating pages. Literally *revelled*, because they were more entrancing than the finest novel I had ever read.

I had many happy leisure hours on this glorious holiday; but they were not lazed away. "The little grey books" made any odd hours literally golden, because I have come back to work not only refreshed and renewed in body, *but also in mind*. I am not possessed by that "after-holidays" feeling. I am gloriously alive, and my mind functions now as it never did a few short weeks ago. Ideas throng through my mind—ideas that are increasing my income, too. Life is immeasurably more interesting to me now.

If you who are reading this have not yet taken a holiday, you cannot do better than make the "little grey books" your holiday companions. Until you do

so you cannot realise what a fascinating thing a real holiday can be. A mental holiday, if you please, because the "little grey books" "spring clean" the mind, and sweep away the mental cobwebs, replacing them with clear-thinking, keen, analytical sense, and a glorious power of mental imagery.

There is a little book entitled "Mind and Memory," and it was after reading its fascinating pages that I decided to own a set of the "little grey books" it talked about. This little book has been read by 3,000,000 people. 500,000 have *acted on the advice it contains*.

You can have a free copy of this widely-read book, by writing to the Pelman Institute, 199, Pelman House, Bloomsbury Street, London, W.C.1. If you act on its advice, and take the "little grey books" with you, I promise you a holiday brimming over with interest, for you will enter upon a new mental world—you will see things clearly that you only glimpsed before. Problems that previously worried you for days will puzzle you no longer; you will see things, not "as in a glass darkly," but permeated with the crystal light your awakened faculties will shed upon them. You will think clearly through to the solution of any problem that presents itself. You will no longer guess about things—you will *know*.

"Pelmanism will enable you to clear your mind of vague and inaccurate information, and put you on the road to obtain, as quickly and cheaply as possible, the right learning."—Sir HARRY H. JOHNSTON.

"If Pelmanism has strengthened my logical sense, it can do the same for a woman who cares to take the course."—W. L. GEORGE.

"I can vision a new system of education in schools, the Pelman System: I can vision a public of nimbler minds and clearer judgment because of it."—ROBERT LORAIN.

"In my opinion, the Pelman method of brain building should be universal. I plump for Pelmanism each time."—General SIR O'MOORE CREAGH, V.C.

"Unless we are to sink in the world and bid farewell to the proud position which we have held for centuries, there must come another period—that of reconstruction. Here it is, I think, that the applied principles of Pelmanism may help us"—Sir H. RIDER HAGGARD.

"Pelmanism is not for the self-satisfied; nor for the easily satisfied, content with any way of life, no matter how narrow and poor; nor for the sluggard, too inert; nor the laggard, too idle. It is a means of energising, and energy is the master-force of everything."—Sir JAMES YOXALL.

* * *

Full particulars of the Pelman Course are given in "Mind and Memory," which also contains a complete descriptive Synopsis of the 12 lessons. A copy of this interesting booklet, together with a full reprint of "Truth's" famous Report on the work of the Pelman Institute, and particulars showing how you can secure the complete Course on special terms, may be obtained gratis and post free by any reader of "The Motor Cycle" who applies to the Pelman Institute, 199, Pelman House, Bloomsbury Street, London, W.C.1.

In answering this advertisement it is desirable to mention "The Motor Cycle."

THE

PH
HIGHEST GRADE

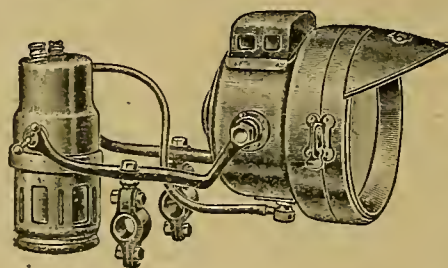
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NOVELTY IN COMPETITION.

The First Scooter Race. No Limit to Stopping and Starting Tests. A Sporting Afternoon's Trial in which Watches were Taboo.



THE FIRST SCOOTER RACE. A highly amusing event. The fastest scooter was estimated to do 15 m.p.h.

A COUPLE of burning questions in the motor cycle world at the present time are "How to determine a winner in competition without resort to the objectionable secret check," and "Motor scooters"—to stand or not to stand?

The first query is an ancient one, the latter is of much more recent origin, and it was partly with the object of assisting in the solution of the questions that the idea of a road test by *The Motor Cycle* staff was conceived. Thus it was that the various members of the editorial, artists', and photographic staffs converged on the Edge Hill range from London and Coventry last week on solo and passenger machines of all types and sizes. Three scooters—the Smith-Clarke, the Antoped (an American production), and the A.B.C. Skootamota—were at the hill, two, shame to relate, conveyed thither in the tonneau of a car, but the A.B.C., with its sensible pan seat, was comfortably ridden from Banbury ready for the fray.

Perhaps, naturally, the scooters formed the greatest novelty at first. Venturesome spirits disported themselves up and down, performed evolutions in the shape of circles as small as threepenny pieces and figure eights, as if practising for the blue riband of the skating world. Of course, the ladies of the party were immensely attracted by the "funny little" motor bicycles, and a queue had to be formed to enable each one to take his or her turn on the "joy bicycles." Stand up and sit down seats were provided, and

each formed his own opinion of desirable features of the ideal scooter by the comparisons afforded. It was indeed an edu-

cational event, for, despite all the prominence given to scooters, one doubts if three had ever before run together at one time.



A slow race for solo mounts, won on an Edmund spring frame machine fitted with the new "Union" power unit. The Enfield took second place.



Ladies rode the scooters without the slightest hesitation, and completely mastered the controls after a minute or two's explanation (Left) The Smith-Clarke scooter, a seatless model. (Right) The A.B.C. "Skootamota."

But the Autoped had developed a fit of the sulks, and was grunting up and down the course very disconsolately, perspiring individuals on that gorgeous day chasing it down the roadway.

Scooter Practice.

Apparently, the twist grip on the joy stick stuck, and no amount of adjustment would persuade the combined throttle decompressor to continue to work; but a more ingeniously thought out machine one could hardly imagine. By pulling the joy stick towards the rider the free engine is operated, and further downward pressure applies the brake. Starting, however, was not too easy, as the weight of the engine being so far forward, violent pushing to start resulted in the rear portion jumping up and kicking the rider on the calf. That vice did not deter the intrepid riders, for several fresh from the Army (there were six captains present) wore field boots! As a result the little American gracefully reposed most of the afternoon in the shade by the roadside, and it is now for sale at the bargain figure of £100!

So novel had these scooters proved that many well stocked picnic baskets were neglected during the luncheon hour.

Soon all present considered themselves sufficiently proficient to start in the great motor scooter race—the first of its kind—which was to follow. The event was run off in pairs, from the scratch mark, the winner of the heats appearing in the semi-final. During the heats each competitor judged his own speed (which formed one event of the afternoon), and an average was struck to determine the handicap for the semi-final and final events. A spin of a coin gave the choice of machines.

The seven heats in the first round were all wins for Skootamota, partly on account of the fact that, with its saddle, it approximates to a motor cycle, and most of the competitors were more accustomed to this form of vehicle than the newer type with platform only. The races, however, were closely contested, and, once away, the Smith-Clarke showed a good turn of speed. In the second

round, the Smith-Clarke was given 12 yds. start, in consideration of the fact that its engine was fifteen years old and scarcely a fair competitor for the latest Granville Bradshaw creation of the same capacity.

Edge Hill Climbed.

The results in the three races in the second round gave two wins to the Smith-Clarke, and in the semi-final each won one race. Finally, the little Clement Garrard engine, on the Smith-Clarke, roared as it had never roared before, and got home a winner of the first scooter race by about 8 yds. Later, however, the A.B.C. production levelled up matters by climbing the 1 in 7 gradient of Edge Hill, piloted by an eleven stone rider, which was a really remarkable performance for so small an engine with a single gear ratio. Slight assistance with one foot when in sight of the summit was all that was necessary. Incidentally this test was made to settle a wager between a scooter enthusiast and one of the staff who was sceptical.

Highest up Wins.

The next event was a single gear ascent of Edge Hill on a lightweight machine so adjusted that it could not possibly climb the hill—a simple test of driving skill. The winner, who had never previously seen the machine, got half way up the gradient before he stopped.

Here it may be interposed that no watches were used throughout the afternoon—The Motor Cycle staff have a natural objection to any trial decided by the watch, but prefer to concentrate on the survival of the fittest amongst the competitors.

The complete regulations for the six events of the afternoon were, as a matter



The winner of the sidecar class in the stopping and re-starting test—an 8 h.p. Victory Matchless.

Novelty in Competition.—

of fact, included on a postcard, which suggests that in many cases trials regulations are overdone.

Stopping and Starting ad lib.

The event which followed the test of driving skill was the most strenuous of the afternoon. The regulations for the event were quite simple, viz., acceleration, braking, and clutch tests. Standing start; two stops and re-starts at points indicated. Class I, solo machines. Class II, passenger machines.

It was a type of event calculated to weed out competitors who:

- (1.) Failed to handle their machines skilfully.
- (2.) Whose brakes were bad.
- (3.) Whose clutches were fierce or badly proportioned.
- (4.) Whose gear-changes were difficult and awkward to operate, besides which
- (5.) A premium was placed on acceleration between the tapes.

In the first heat a 4 standard Triumph sc. competed against a 4 experimental chain driven Triumph sc. Both machines went up well, but the latter had a

smoother clutch, and made the restarts without hesitation and won.

A 5-6 Rover sc. and a 4 Norton were matched for the second heat. Both were new machines in magnificent fettle. The Norton was away first, but the Rover got ahead before the first stopping point. The Norton rider, however, got away more smartly, and both roared up to the next stop. The twin, however, finally won the heat.

An 8 Victory Matchless was drawn against the chain-driven Triumph in the semi-final.

On the first section of the hill the "single" held its own, but at the critical moment the terminal jumped off the plug, which left the Jap-engined Rover and Matchless sidecars to decide the final heat, and the 8 h.p. mount won comfortably, though each machine re-started with ease on three occasions during the course of the climb.

Solo Riders Stop and Restart.

In the solo class a modern A.B.C. first competed with a rider of a 2½ two-stroke Excelsior, and, naturally, won. The 3 h.p. Enfield, though behind at

the last stopping place overtook and passed the Lea-Francis near the summit. The A.B.C. was then matched against a "Union" engined Edmund, and won, but lost the event in a final trial with the Enfield fitted with an R.C.F. carburetter, which, notwithstanding its age of five years, showed a fine turn of speed, and led all the way. The A.B.C. clutch was slipping.

Incidentally, a very favourable impression was obtained of the new Union power unit which the staff is testing at the present time. The new Norton and Rover, too, were exceptionally fast, and a little Excelsior demonstrated its power by climbing nine-tenths of Edge on standard top gear with an eleven stone rider.

The final event, a slow "race," for solo machines, was won by the rider of the Union-Edmund, who travelled so slowly that he had difficulty in balancing the machine. The Enfield was second.

A sporting afternoon's programme, attended by glorious weather, ended with those present being entertained to tea on the terrace at the Round Tower by the Editor.



A new event with an old background. The Motor Cycle staff of writers, artists, and photographers congregated at the Round Tower, Edge Hill.

A DESPATCH RIDER'S JOY RIDE.

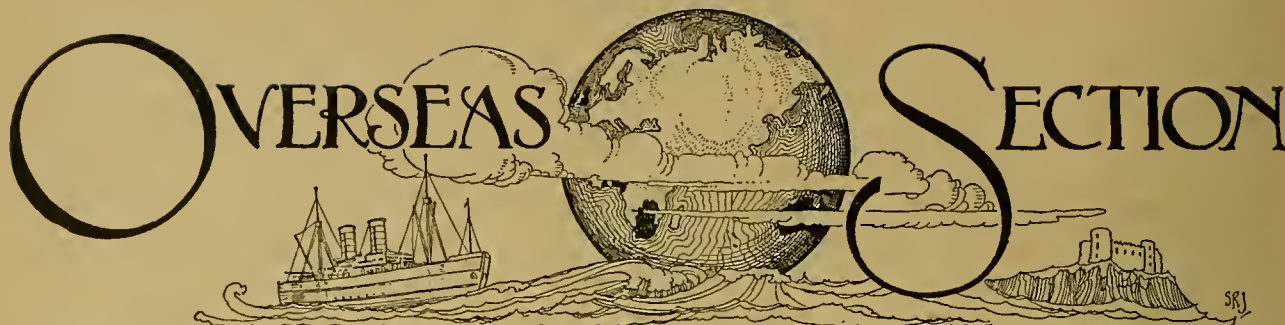
WE recently came across about sixty D.R.'s on the road from Daventry to Banbury. They were on their way from headquarters, Wellingborough, to Banbury via Northampton, Weedon, Newnham Hill, and Byfield, returning via Brackley and Towcester.

The sergeant, with whom we had a chat while he superintended the repair of a punctured back tyre, informed us that the

men came from the Wellingborough Signal Depot of the Royal Engineers. Each man carried a scheduled route card and map, and where there was any doubt about turnings, etc., the data marks on the ordnance plan were given on the schedule, and such marks had to be followed. For instance, in the neighbourhood of Newnham the data marks 385 and 384 indicated that the riders coming from Weedon had

to pass the foot of Newnham Hill on the north side and continue from the inn at the hill foot to Badley without climbing the hill.

Supervised rides of this nature are just the thing to keep the D.R.'s at home depots from becoming stale, and the event was regarded by the section as an enjoyable little club event, although under military discipline.



A Commentary based upon Practical Experience and a Study of Overseas Opinions.

Carrying Room.

THE question of proper provision in the way of accommodation for tools and spares is a subject to which we have often referred; but a recent appeal from an overseas rider induces us once again to give this matter editorial comment. The ordinary design of motor cycle does not lend itself particularly to the carrying of spare equipment of any time, yet one cannot help feeling that both the designers of machines and the makers of accessories are insufficiently liberal in their estimate of the equipment anyone undertaking a serious tour may desire to carry. Even for solo riding in England, it is often difficult to stow away necessary equipment in safe and convenient harbourage, and one has only to view the machines of competition riders or the riders themselves in order to realise how totally inadequate are two small tool-bags for stowing away the various spares and accessories which are considered necessary.

To the overseas rider the problem is an infinitely more serious one, for, as our correspondent points out, his riding may lead him through hundreds of miles of country where repair depots of even the most crude kind do not exist, and therefore he is compelled to carry with him every conceivable article that may be wanted to save him from becoming utterly stranded.

Necessary Tools and Economy of Space. BEFORE proceeding further, it may be as well to consider in what manner

the "necessary outfit" can be cut down to the accommodation available, as there is no doubt that a large number of riders habitually carry a great deal that might advantageously be left at home. First, a large array of spanners is not necessary, and by

careful and judicious selection the tool-roll can generally be cut down to quite modest dimensions. The following may be quoted as all that is necessary in this respect:

- Large adjustable spanner.
- Small adjustable spanner.
- Valve cap key.
- Screwdriver.
- Pliers and wire-cutters.
- Square-nosed punch.
- Small cold chisel.

B.S.A. or similar multiple-ended key.

This is not a very formidable array, and if neatly kept together in a tool roll the same pannier will generally accommodate, in addition, a coil of copper wire, and a small box of assorted nuts, washers, bolts, cotters, and similar small items.

Thus we have all the heavy articles stowed away in one compartment, which leaves the other at our disposal for lighter and more fragile goods. Of course, every rider has his own pet gadgets, but the following may be set down as a fairly practical array for the second bag:

- Repair outfit.
- Spare sparking plug.
- Chain links.
- Pocket soldering outfit.
- Spare valve.
- Roll of insulation tape.

It is hardly necessary to point out to our practical overseas riders that there is nothing to be gained by taking, for example, a large number of chain links of exactly the same size. A half link, a clip link, a spare bolt, and one or two of the most likely oddments will see one out of any ordinary mishap, and the same applies, of course, in arranging an assortment of nuts and bolts.



British motor cycles in the goldfields of W. Australia. Mr. L. Watson, who sends us the photograph, says: "The Triumph sticks these sandy tracks very well, the only trouble being the insufficient ground clearance of the engine."

Overseas Section.—

Further-Necessities. THERE still remain, however, more bulky goods to be disposed of. These are, or may be:

Spare inner tube.

Sensible sized oilcan.

Spare belt or chains complete.

Spare saddle, or fork, spring, or both.

Tin of engine oil.

The spare inner tube, bathed in French chalk, can be wrapped up compactly in American cloth and securely fastened under the saddle in the nook of the fork and resting on the rear mudguard. A leather pocket and carrier, rather resembling a knee grip, can very easily be made to embrace the fore end of the tank, so that the oilcan stands spout upwards and is instantly accessible, but generally the rider is left to exercise his ingenuity in stowing away the remaining articles according to the design of his machine. He is wise if he strives to locate them as near midships as possible, as they are then saved a good deal of jolting, and thus are more likely to retain their respective places of anchorage. The rear down tube and the lower tank tube frequently form convenient points of attachment for odd gadgets.

A Selection of Letters from Readers scattered all over the World.

The Export Market and Manufacturers.

The following letter from Mr. J. VERNON C. BROOK, though not from an overseas reader, bears so strongly on an important phase in motor cycle trade that we insert it in the Overseas Section:

"Recent experience in asking English motor cycle manufacturers to quote for machines for the South American markets leads one to believe that English manufacturers are to-day taking a line of least resistance as regards selling their output, viz., filling their books with orders for the home market almost to the entire neglect of the foreign markets, for which they will probably be yearning in a few years' time.

"The majority of manufacturers, when approached and asked to quote for a sample machine for the South American market by a large firm of export agents, replied to the effect that they could not undertake to deliver a machine in less than four to six, and in some cases eight, months, and the prices quoted were only those prices which are usually quoted to their English agents.

"Surely now is the time to endeavour to enter the foreign markets with motor cycles. American competition looms largely ahead, and reports from representatives in foreign markets, particularly in South America, are all in the same strain, viz., 'The Yankees are here.'

"One would suggest that any enquiry from a foreign market should be given Al preferential treatment, and the very first machine out of the works should be shipped abroad at a price which would allow the minimum profit margin.

"There is no doubt whatever that English machines are in every respect equal to those made by our friends across the water, and, in fact, in the majority of cases they are infinitely superior, not only as regards the design, appearance, and reliability, but also as regards what is perhaps the most important factor—their durability.

"One would also suggest that the Society of Motor Manufacturers and Traders should take this matter up with their members immediately, with a view to some consolidated policy being agreed upon in this matter.

"Doubtless manufacturers, after a long war and the strain entailed during the period when munitions was the cry on all sides, are elated on finding their books filled to overflowing with orders from home markets, which give the minimum amount of trouble as regards despatch, packing, payment, etc., and therefore do not trouble to cast around for orders which might entail more trouble.

"Surely this is the most short-sighted policy imaginable, as there can be little doubt that with the enormous increase of production and the large number of new firms which are

Additional Space. No rider is likely to object to too much carrying room, as the list we have set forth consists merely of the barest necessities. Many riders would not feel content with so modest an outfit, and if the tool bags were double the ordinary size, few overseas riders would experience difficulty in filling them.

The tank tool box, already in use on one or two American machines, has the advantage of accessibility, and is well placed as regards road shock. It is a most convenient arrangement for carrying light goods and the ever necessary duster. The knee grips designed to carry dusters and possibly a light shifting spanner are also commendable, as is a saddle provided with a pouch, in which a spare tube could be housed, for, so often when a tube is carried in an unsprung position, it is found to be rubbed and useless when finally required. The spare tube should not be exposed to light and dust, or it will speedily perish, and though the handle-bars may suggest a convenient harbourage, apart from the effect on the steering, it is a great mistake to load up the bars any more than necessity demands. Best leather cases may also be obtained which can be strapped to various parts of the frame.

entering into the trade, the time is not far distant when over-production, as regards the home market, will be the order of the day.

"By adopting this short-sighted policy, however, when this time comes it will probably be too late to enter into foreign markets with the same ease as would be possible to-day, not only because the demand would have been met to some extent, but also because American, and possibly even German, machines will have found their way into those markets, and the users will have become familiar with them; the agents also will push the sale of the machines which they know best, and general conditions will be more difficult than to-day.

"It is to be sincerely hoped that English manufacturers will realise their responsibility to the nation in this matter, and at once adopt a line of policy which will at least lead one to suppose that they are making every endeavour to enter into foreign markets.

"One would like to see this subject threshed out at length in your columns, as possibly there may be others who hold entirely different views on the matter."

A Good "Big Four" Performance.

Mr. A. G. SALMON, writing from Pietermaritzburg, S.A., says: "You will be interested to learn that the Norton put up the fastest time at the Pietermaritzburg Speed Trials, held on April 26th, and attained a speed of 68 m.p.h., and also secured first place at the Petrol Consumption Test, held on the same day by the Natal Motor Cycle Club, over a course of twenty-six miles. A big four secured first place in two of the most strenuous tests held in Natal, i.e., Pietermaritzburg Hill Climb. The hill was one mile long, strewn with boulders, and was merely a track. The machine was geared $3\frac{1}{2}$ to 1 on top, and took the hill with reserve power and picked up without the slightest hesitation. The winner's time was 1 min. 25 secs., the second man's time being 2 min. 15 secs., so you will see from this that the performance of the Norton was an excellent one.

"A point-to-point race was held over a nine-mile course, across country (no roads), bush, three rivers, sand, mud, etc., and a railway track of two and a half miles. It was only possible to cover the latter between the rails, and, as the sleepers were 2ft. apart and standing 4in. to 5in. above the ground, you will realise that this was somewhat of a test to call upon a motor cycle to accomplish. However, the Norton, ridden by Mr. Morcom, finished 47 min. ahead of any other machine. There were seven starters, and only two finished the course, the other machine being a Triumph."



LLANDRINDOD WELLS.

Touring Headquarters for Central Wales. Picturesque Notes.

By CHARLES G. HARPER.

As the A.C.U. Six Days Trials will be held in Wales, Sept. 15th to 20th, with Llandrindod Wells as a centre, the following notes will doubtless be read with great interest by would-be competitors and others who desire to know something beyond the details of road surface and gradient of the country through which the trial will pass.

NO more cheerful and convenient centre could have been found for the A.C.U. Six Days Trials next September than Llandrindod Wells, that up-to-date health resort of Radnorshire, which occupies a position at the gate of Wales, situated midway between north and south. Far removed from London—the distance is 176½ miles—Llandrindod, with its summer population of close upon four thousand, stands amid the mountainous hills of the most sparsely-populated county, where no industrial developments have come; with the great solitudes of Radnor Forest on the east, and on the west the heights of Cardiganshire, where the Wye, the Towy, and the Irfon rivers have their rise. Llandrindod is approached from London most conveniently by Oxford, North-leach, Cheltenham, Gloucester, Hereford, Kington, and New Radnor: a pleasant route in itself. From Birmingham the distance is 71 miles; from Manchester 130; from Shrewsbury 53; Chester 84; and Cardiff 72. Beyond Llandrindod the tourist comes in another forty-six miles to the coast of Wales, at Aberystwyth.

An Architecturally New Town.

Almost without exception, the towns and villages of Wales are an effect of grey and white, set amid the green-grey of the eternal hills. They are not beautiful as a rule. The tourist does not usually perceive this because of the setting amid the wonderful scenery. Llandrindod is in another key of colour: it is red. And, in its present guise, it is new. Nothing old about Llandrindod, except the parish church of the Trinity, from which the town and the health-giving springs of the wells derive their name. For Llandrindod means "Trinity Church," and the older Llandrindod, whose spa was originally discovered in 1696, and of the health resort which was fashionable about 1749, nothing remains save that church and the farm down below it, called "Llandrindod Hall." That occupies, more or less, the site of what was, in the eighteenth century, once the "Grosvenor" Hotel. There the invalids, real and imaginary, who came to drink the waters stayed, and there, too, came the rogues and the professional gamblers of that time, to prey upon the wealthy, as they did at Bath and other fashionable spas. For Llandrindod was fashionable then, in spite of that old-time difficulty of getting to the place. The gamblers ruined it: the hotel

was demolished, and the wells declined. Everyone thought Llandrindod was finished; and so, indeed, it was for that generation. The next saw it modestly recovering; for the healing springs are eternal; and each generation has its aches and pains, and over-eats itself, and behaves in ways it did not ought. And so there you are! In the days of that modest recovery, the visitors to Llandrindod were provincials, and it remained for the coming of the railway to bring back all the old popularity and more. Further, it remained for the great war—now happily over—to give such a stimulus to Llandrindod (and other British inland spas) as never was known. Aix and Homburg, Marienbad, and such Continental baths and spas, are "down and out," and our own resorts are reaping the benefit.

Scarcely a house in Llandrindod Wells is there which can have come to its twenty-fifth year. I love antiquity, but if I cannot have it, give me something quite new. Do not invite me to your has-been resort which was built and flourished in the architectural dark ages, when grey stucco was your only wear, and the dismal semi-basement breakfast room and other domestic dungeons prevailed.

Llandrindod, as I have said, is architecturally new. Also, it is red. It flowers scarlet in its brick and



Cefnlllys, near Llandrindod Wells.

Llandrindod Wells.—

terra cotta, like some geranium, and is eminently cheering. So, likewise, is the beautiful Rock Park in the centre of the town. It is a town of gardens, hotels, boarding-houses, and bands. And of automobiles. No need to be dull here. Yet, if you wish to commune with nature, and to be alone to think great thoughts, there, all around, are the lovely solitudes.



A picturesque corner in Montgomery.

There, half an hour or so away, down in its profound hollow, is Dyserth, or Disserth, consisting of a church and one farmhouse: a lonely spot which takes its name from its position in what were once the wilds—"the desert," in fact. And, in another direction, an easy walk, Cefnlllys ("Kefenlees" is the pronunciation), even more beautiful and inaccessible, for you must needs walk to it; while to Dyserth you can motor or cycle.

The most lovely and interesting run by motor cycle around Llandrindod is without doubt that northwards to Newtown. Indeed, I have a perfect little tour of delight for you; as thus: Llandrindod to Llanbister, $6\frac{3}{4}$ miles; Newtown, $17\frac{1}{4}$; Garthmyl, 6; Montgomery, $2\frac{3}{4}$; Bishop's Castle, 9; Clun, 6; Knighton, 7; Whitton, $3\frac{1}{2}$; New Radnor, 6; Llanvihangel-nant-Melan, 3; Penybont, 6; Llandrindod Wells, $3\frac{3}{4}$. This is a circular tour, totalling seventy-seven miles. From Llandrindod you proceed along the lovely valley of the Ithon, growing more beautiful as you proceed. Passing Llanbister, with its interesting church on the rise to the right, in another mile, beside the road and the river on the left, is the humble little church of Llananno. Well might the traveller pass it by: but that would be a mistake, for it contains one of the most wonderfully enriched ancient rood screens in Wales: a monument of the old wood-carver's art.

In the Severn Valley.

Then, passing Llanbadarn Fynydd, and rising to Clog Moor, 1,233ft., a long, long, and winding descent conducts you into the Severn valley and into the neat and pleasant Newtown, at a junction of roads whence you may proceed to any place you please. We continue to Abermule and Garthmyl, and there turn right for Montgomery, that decayed town of the splendid name and the historic past. Montgomery long ago gave up the attempt to compete with any other town. It is of the past, like the ragged ruins of its Norman castle on the wooded heights above. But it is a pleasant place on a summer's day. There is the great empty

square; and there, down below the Castle Hill, stands a lovely old group of houses, with the smoke from their chimneys lazily curling up to the background of trees. There are interesting and gorgeous monuments in the church; and in the churchyard (capture a native to show you where it is, otherwise you will never find it!) will be found the "Robber's Grave." It is illogically so-called, for the unfortunate man, named Newton, who lies there was unjustly convicted and hanged for highway robbery and murder which he did not commit; so he suffers the lasting indignity of a posthumous stigma. Tradition says that he declared, as proof of his innocence, that grass would never grow on his grave. It is marked by a white rose bush. Local superstition declares that cynical people who have sown grass-seed there have come by sudden and extremely unpleasant ends. However that may be, this observer noted that no bare place existed. In fact, the grass there was exceptionally luxuriant.

A Town of Hilly Streets.

This is a region of abrupt and striking hills. In the distance you see the Breiddin Hills, lovely beyond compare, with the pillar to Admiral Rodney prominent on them. And Bishop's Castle town, to which we now turn, is one of amazingly hilly streets. The Bishop's castle no longer exists, and nothing in the little town need detain the tourist. Here we turn south, and come past Clun and its castle to the little town of Knighton, of more crooked and steep streets. The westward road goes to Llandrindod by Bleddfa, but our way is still southwards, on to Whitton village, and is wooded and hilly. Two miles beyond, at Beggar's Bush fork of roads, we bear right, and come to New Radnor: a very small, very quiet place, called a "town," but really a village, and not, by a thousand years or so, so new as its name would imply. The even smaller Old Radnor, near at hand, is so old that no



A sixteenth century cottage near New Radnor.

Llandrindod Wells.—

one dare give a date to it. But New Radnor has the loveliest sixteenth century cottage that ever I have seen. You cannot help noticing it, for it stands prominently on the main road: the last house on the right as you leave for Llanvihangel-nant-Melan, beyond which we bear right at fork for returning to Llandrindod through Penybont.



Powis Castle, or "Castell Coch."

An interesting extension of the route detailed above would be that which would continue from Garthmyl to Welshpool, and on to the "Cross Foxes" Inn at Llandysilio; and thence proceeding to Lake Vyrnwy, that eighth and modern wonder of Wales—if, indeed, we have any room left in these times for wonder, which I doubt. Approaching Welshpool by a level road, with the canal on the right and the park of Powis Castle on the left, we find Pool, as it is styled locally and on the milestones, to be a rather ragged old town, somewhat lamenting the success of Newtown in taking away most of its flannel-making industry. Powis Castle stands romantically high. The Welsh call it "Castell Coch"—from its red sandstone walls. It is the ancient seat of the Earl of Powis.

The Largest Lake in Wales.

Turning left at the "Cross Foxes" by the modern church of Llandysilio, the road goes beside the river Cain, which gives part of its long name to the village of Llansaintffraed-ym-Mechain. And so, by Llanfechan and Bryngwyn railway station to Llanfyllin. After this comes the four-mile rise to Mynydd-y-Brith and the following steep descents to Pont Eynon. Lake Vyrnwy, the largest lake in Wales, now comes in view. The road on to Bala is an impossible one, and it is necessary to return the way we came, to Welshpool. There and back is seventy miles.

Another extremely attractive round is that detailed below. It totals 140½ miles. Leaving Llandrindod for Rhayader by Llanyre, we come in ten miles to Rhayader, a little town on the upper reaches of the Wye, greatly frequented by anglers, and latterly for the interesting lakes and dams formed for the Birmingham water supply at Cwm Elan. These, however, four miles distant in another direction, should form the object of a short excursion in itself. We pursue the Aberystwyth road, a main road, but very hilly, through Gamallt to the summit, Steddfa Gurig, 1,358 feet. Here the heights of Plynlimmon look down

upon the wild and desolate scene. Fifteen miles, mostly descents, lead into Aberystwyth, that popular seaside resort, too well known to need description here. The hilly coast road thence, to Aberaeron, sixteen miles, past Llanychaearn, and the steep Ffos-rhyd-Galed Hill to Llanrhystyd, is spectacular, and ends delightfully at the mouth of the Aeron river and that lovely valley which the eighteenth century poet has sung so attractively:

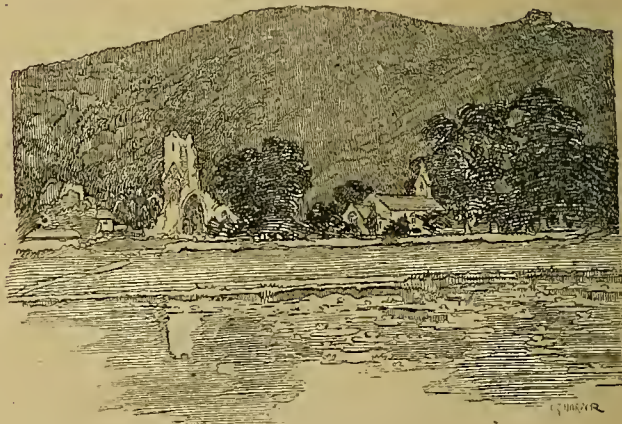
"The nymphs are gay,
The swains are hale,
Such blessings dwell in Aeron's Vale."

So bracing, eh!

It is therefore encouraging to know that our way lies along the Vale of Aeron. And very nice, too, except the steep hill at "Temple Bar" and Tycam Bridge, eight miles out. Five miles beyond is the dull little town of Lampeter, whence we proceed to Pumpsaint. The way to Talley grows easy, and extremely beautiful; the Cothi flowing along amid meadows, a remarkable change from the kind of scenery hitherto passed. Where the Vale of Cothi widens, with the tree-clad hills retiring to the background, are situated the ruins of Talley Abbey.

In a further eight miles the town of Llandilo is reached. Not an interesting town; and therefore the tourist need not hesitate to speed away down its High Street. The way now lies along the great mail-coach road to Llandovery, thirteen miles, past Abermarlais and Llanwrda. Llandovery itself, although a town of sorts, is a very rustic-looking one. Here, in the level strath, the rivers Towy, Bran, and Gwyddering come to their meeting place, and on a little mound by the waters stand the remains of the castle. The outstanding peculiarity of Llandovery would seem to be a queer taste for distemperer nearly all the houses with a salmon-pink wash.

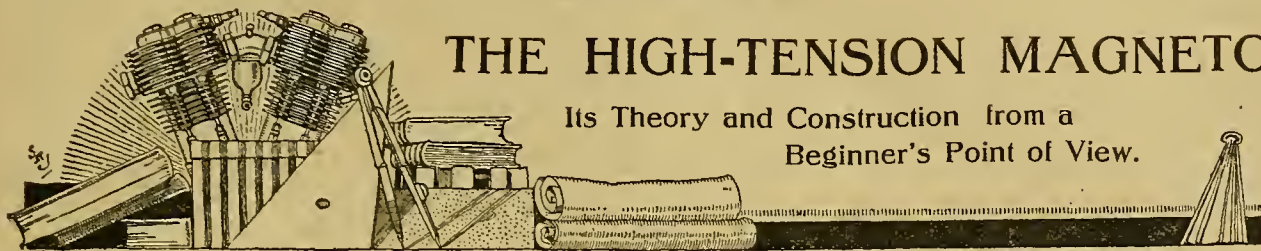
Leaving the main road, "we come again into beautiful scenery at Glan Bran, and presently begin the rise to the Sugar Loaf Hill, a pass in the mountains; very grand and impressive. Thus we come into Llanwrtyd Wells, a small Welsh spa, with a fine modern hotel. Passing Cefn-y-Bedd, which means the "Ridge of the Grave," in Cwm Llewelyn at Cilmerri, a small obelisk on the right marks the spot where Llewelyn ap Gruffydd, the last native Prince of Wales, was killed, 1282. In another two and a half miles the small town of Builth is reached, and in eight more we come home to Llandrindod.



Talley Abbey, in the Vale of Cothi.

THE HIGH-TENSION MAGNETO.

Its Theory and Construction from a
Beginner's Point of View.



(Concluded from page 597—June 12th.)

IN our issue for June 12th, we gave the first instalment of this instructive article on the high-tension magneto, in which the author referred to the various parts of the instrument, their construction, and functions. We repeat the concluding paragraph of the preceding part of the article:

As the armature revolves in a magnetic field, and, if the contacts are closed, the armature also has a magnetic field of its own, there must be some distortion or displacement in the permanent magnetic field produced by this second or created field. In the appended diagrams, two conditions are presented.

(A) series represents the armature at different positions during a quarter of a revolution, or, to present the same thing in other words, passing from the position where the maximum flux is passing through the core of the armature to the position where the minimum flux is passing through the core.

The Lines of Force.

During the A series of diagrams (fig. 4) the primary winding of the armature is open circuited, say, by placing a small piece of insulating material between the contact points. It will be noticed as the armature revolves that the lines of force begin to leak across from the advancing armature cheeks (L) to the opposite pole shoe of the magnet system. This process, more or less, gradually goes on until all the lines of force are passing across from pole shoe to pole shoe via the armature core cheeks, while practically no lines of force are traversing the armature core. If the armature is revolved any further, the lines of force will again be reinstated in the core, but in the opposite direction. It is well to note here that this reversal of flux, or lines of force, is due to the change in the position of the armature, and not to any actual change in the direction of passage of the lines of force. If some device for showing the wave form of a generator (such an apparatus is commonly called an oscillograph) had been connected to the terminals of the primary winding, a voltage curve would have been produced by this rotational movement of the armature of approximately the shape shown in fig. 7. A voltage curve exactly similar in shape to this one would have been obtained from the secondary winding, but of a magnitude, when compared to the one shown, proportional to the ratio of turns between the primary and secondary windings. Now the maximum voltage that it is possible to obtain from the secondary of the average high-tension magneto is in the neighbourhood of 2,000 volts, that is, when the primary winding remains open-circuited, and the magneto armature is re-

volved at high speed. This voltage is quite inadequate for jump spark ignition, and again, is a quantity that varies with the speed of the machine; in fact, it is quite true, for all practical purposes, to say that this voltage is directly proportional to the speed.

The motor cycle engine is a variable speed machine, and if normal efficiency is to be obtained the ignition spark must be quite capable of producing the desired result at very low speeds as well as high. Also the instant of occurrence of the spark must be under very accurate control, otherwise the action of the engine would be most erratic.

It will be gathered from the foregoing that when the magneto is operated with the contact breaker open the machine is simply an elementary form of alternating current generator.

Now it is worth while at this point to review the fundamental laws governing the generation of voltage or e.m.f. by means of a conductor cutting through the magnetic lines of force:

1. The voltage generated is directly proportional to the number of lines of force if time and number of turns are constant.
2. The voltage generated is proportional to the number of turns in the coil that does the cutting if time and number of lines of force are constant.
- 3 (and most important). The voltage generated is inversely proportional to the time required in the cutting, other factors remaining constant.

How the Spark is Produced.

It will be quite obvious that the number of turns of wire that it is possible to wind on a magneto armature is limited, as is also the number of lines of force that can pass through the armature core. Therefore the only method of getting the necessary high voltage for jump spark ignition is to reduce the time during which the flux cutting takes place; in other words, the time required for the lines of force to leave the armature must be reduced to the absolute minimum. The lines must not be allowed to leave the armature core gradually as the armature revolves, as depicted in the A series of diagrams, but must be restrained until they are at such a tension that if released they instantly readjust themselves to such an extent that they leave the core entirely, and are even reinstated in the opposite direction. The way in which this is accomplished will be apparent by inspecting the second series of diagrams, B. In this series, the primary winding is short-circuited by removing (shall we say?) the imaginary piece of insulation from between the contact points, as mentioned previously. It will be noticed as the armature revolves that very few lines of force are leaking from the advancing armature cheek to the opposite pole piece compared with the same armature position in diagram A. What is happening is that the attempt to cut the lines of force has set up an e.m.f. in the primary winding,

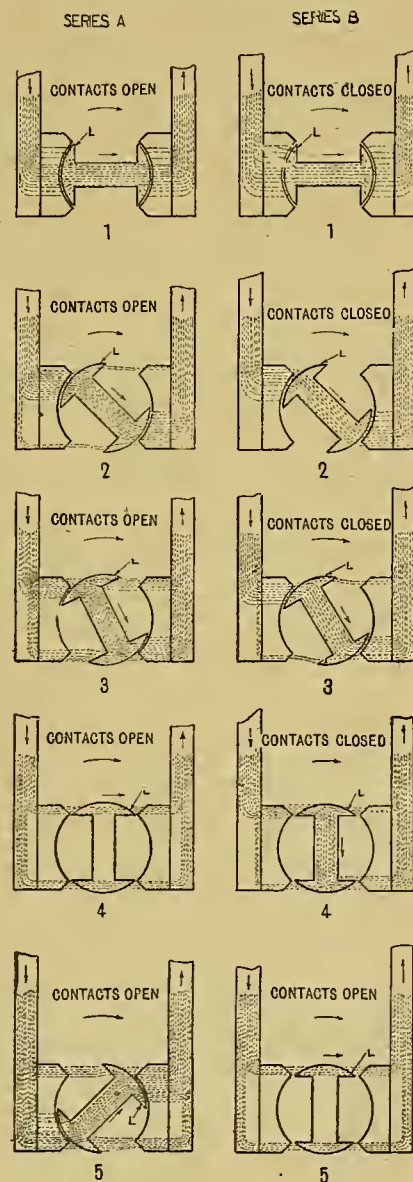


Fig. 4.

The High-tension Magneto.—

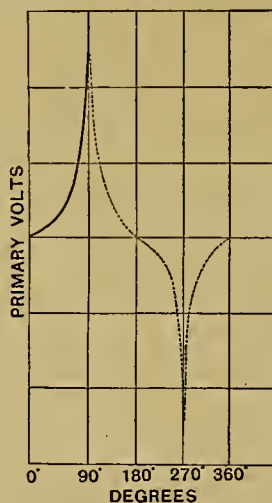
and this e.m.f., acting in a closed circuit, has set up a current. This current, obeying natural laws, has established a magnetic field of its own, and as the polarity of the lines of force composing this field is the same as the lines of magnetic force produced by the magnet system, the two, for the time being, virtually become one.

The mutual attraction of these two magnetic fields enables the armature to drag or twist the main field produced by the magnet system around with it, until a position is reached where, if the main field be released, it will instantly desert the armature core, pass across through the core cheeks, and partly re-establish itself through the core in the opposite direction. When this position is reached, the contact breaker is opened by the cams, and, as the primary winding is open-circuited thereby, the current ceases to flow. This results in the immediate collapse of the magnetic field associated with this current, and as the main field is no longer subject to the influence of the armature field, it readjusts itself in a position depicted in the last diagram in series B. The interval between diagrams 4 and 5 of the series B (see fig. 4) is an extremely small fraction of a second. Now as the lines of force are closed circles, it will be obvious that before the said lines can leave the armature core they must pass through the windings thereon. The very high rate of change or rate of cutting lines of force that occurs at this point is the source of the extremely high voltage of the magneto. Once the above principle is comprehended, it will become reasonably obvious why the high-tension magneto produces a practically constant sparking voltage over a very wide range of speeds, for, as the writer has endeavoured to point out, the actual rotational speed of the armature has little or no influence or control over the actual rate of cutting magnetic lines of force producing the sparking voltage.

The Function of the Condenser.

We have not as yet mentioned the condenser's share of the work. As the primary winding, as well as the secondary, surrounds the armature core, when the contacts are opened a high potential difference would appear across the contacts. An arc or spark would result, which would not only allow the current to flow for an appreciable time after the contacts had opened, thus slowing up the rate of change of flux, and thereby reducing the secondary voltage, but would also dissipate the major portion of the energy, which would otherwise appear in the secondary spark or discharge. Some

device or method must thus be employed to enable the contact breaker to get "from under," so to speak. This is the function of the condenser, and without it a high-tension magneto is useless. What really happens, practically explained, is that the condenser momentarily acts as a short circuit, but a short circuit possessed of most peculiar properties. Without going into the theories of electro-static capacities, I might just explain that when a condenser is connected to a source of e.m.f. there is a momentary rush of current, which charges the condenser. As the condenser becomes charged, it builds up an e.m.f. of its own, which, having an opposite polarity to the charging source, soon stops the flow of current. Now, if the charging force be disconnected, and the terminals of the condenser are bridged by a conductor, there will be a momentary rush of current, and the condenser is discharged again.



Current fluctuations in one revolution.

This is what happens in a magneto: The current from the primary winding when the contacts are opened flows into the condenser, charging it, and raising its potential. When a balance is reached, the condenser immediately takes the upper hand, and discharges practically the whole of its store of energy back into the primary winding. This reversal of the direction of flow of current materially assists in reversing the magnetic field in the armature core. Therefore, the major portion of the total energy present in the armature core at the instant before the contacts open is impressed on the secondary winding, and appears in the spark gap represented by the spark plug.

To sum the whole of the foregoing up in a few words, we might say that the primary winding acts as a trap, by means of which the main field produced by the magnet system is caught up and twisted around until the lines of force are lengthened or stretched just as though they were rubber bands or springs. When a position is reached where, if the lines were released, they would snap or spring back, and thus cut through the windings at great speed, the trapping or restraining effect of the primary is suddenly discontinued, and the lines readjust themselves. The time required for the lines to take up their new positions is exceedingly small, and is governed principally by the efficiency of the design, and also by the quality of the non-permanent part of the magnetic circuit comprising the pole shoes and armature core. There is no destructive action on the magnetism of the main field during this twisting action of the armature, as it simply acts like a series of rubber bands or springs that are continually stretched and released.

Transformation of Energy.

The energy that appears at the spark plug in the form of an electric spark is simply a small portion of the mechanical work, that must be applied to the armature-shaft of the magneto to produce rotation, appearing in another form.

High-tension magneto armatures are often compared with ordinary induction coils, and, although a completely wound armature makes an excellent induction coil when supplied with a primary magnetising current, still the operation of the armature in the magneto is not exactly similar to the action of an induction coil. For instance, in the induction coil we have two windings, primary and secondary, similar to the magneto. The primary winding is used to charge or magnetise the iron core upon which the two coils are wound, and it is the collapsing of this magnetic field when the primary circuit is interrupted that produces the high-tension spark. In the magneto the iron core upon which the primary and secondary are wound is magnetised by the permanent magnet system. The primary winding serves to restrain the magnetism in the core while it is being revolved through approximately a quarter of a revolution. The spark energy for the induction coil is derived from the battery or generator, whichever the case may be, that supplies the primary winding with its magnetising current. The spark energy of the magneto is derived from the work performed in revolving the armature against the resistance of the magnetic lines of force to being stretched as depicted in series B (fig. 4).—C.C.P.

AN OPEN TRIAL FOR PASSENGER MACHINES.

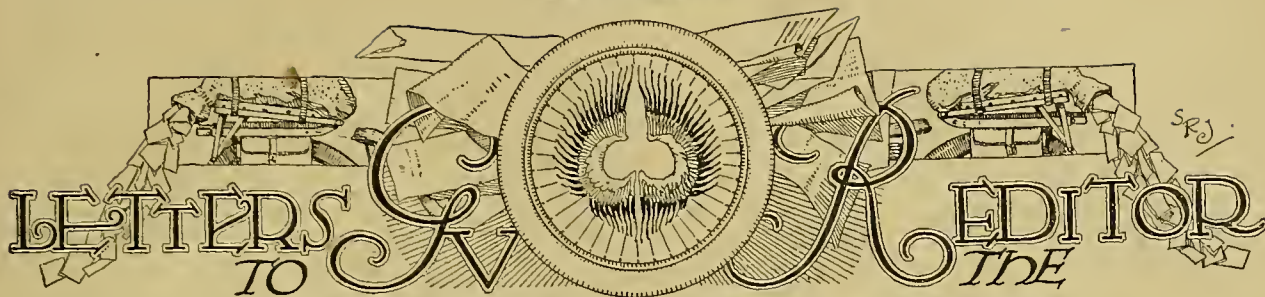
No Secret Checks or Speed Judging in Midland Cup Trial on July 19th.

THE Midland Cup Trial of 1914 was a most successful and interesting event, and there is every reason to believe this competition, for passenger machines, will be very keen this year. The energetic Birmingham M.C.C. has arranged for the event to be held on the 19th prox., starting at 9 a.m. from Stratford-on-Avon, over a 160 miles course.

Secret checks and speed judging competitions are not included, and, in the event of more than one rider qualifying for the Midland Cup, gold medals only will be awarded. In addition to gold and silver medals, there will also be two team prizes for teams of three machines.

The trial will include hill-climbing, brake tests, stopping and restarting, and others tests. Sealed watches will be

carried by the competitors, who will be given one minute allowance either way on schedule time. Speedometers will be allowed. Entry fee for members is 10s. 6d., non-members 21s. Teams may be nominated at an extra fee of 5s. per machine. Entry forms and any further information may be obtained from Mr. S. Kempson Jones, 93, John Bright Street, Birmingham.



The Editor does not hold himself responsible for the opinions of his correspondents.
All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

N.S.U. GEAR CONTROL.

Sir,—Can any of your readers inform me whether they have been able to evolve any more up-to-date method of control than at present exists on the N.S.U. two-speed gear? The present method of control seems to me to be uncomfortable and obsolete. Any sketches would be appreciated by
WM. R. ARMSTRONG (2nd-Lt., R.G.A.).

COASTING WITH EXHAUST VALVE RAISED.

Sir,—Re Mr. Taylor's letter of June 12th. When going down hill with exhaust lever raised, why open the throttle and air? This surely is a great waste of petrol, and I find on my machine, when I coast with the exhaust valve raised and throttle open, that there are a series of loud bangs, which shows that the gas must be exploded somewhere, either in the silencer or cylinder.

If one closes the throttle altogether when coasting, does not the engine draw cold air in through the silencer and exhaust port, and so cool the hottest part of the engine?

I should be pleased to see any readers' opinion on this subject.
DOUGLAS.

Sutton Coldfield.

CLIMBING ON BENZOLE.

Sir,—In *The Autocar* of June 19th I read on page 622, re the benzole test on the Welsh hills, that "Bwlch-y-Groes proved formidable for machines running on benzole where carburettors had not been retuned."

May I say I have been up this hill in a non-stop run from Dinas to Bala on my $4\frac{1}{2}$ h.p. B.S.A. on benzole with the carburettor exactly as the firm sent it out for petrol. The jet was open one turn. The day was very hot and sunny. The ascent was done all on second, except the hair-pin bend at the bottom and a short bit on top. The engine showed no signs of overheating. I also ascended successfully on benzole, obtained at Bala, the hilly road from this place to Lake Vyrnwy, starting on the clutch after every stop at the numerous gates. The engine was quite cool on top of the hill.
M.L.L.

London.

CLUTCH ADJUSTMENT.

Sir,—After reading the article on "Clutch Adjustment," by "Chinook," in your issue of May 8th, I cannot but congratulate "Chinook" upon the advice given. Endless troubles can be traced right back to either a badly designed or badly adjusted clutch, and if riders would only take the trouble to master the design of their particular type of clutch they would, in many cases, be surprised to find what improvements can often be made by merely adjusting the clutch spring pressure.

On three different types of machines, all fitted with Sturmey-Archer gears, I have been able to make improvements by clutch adjustment. The first came about through accident, but the accidental condition proved to be so beneficial that I investigated the matter and found that the benefits could be maintained by spring pressure adjustment, and ever since this occasion one of my points in tuning up a new machine has been to examine the clutch thoroughly and try to improve its adjustment.

I can only imagine that the various makers have been absolutely compelled to adjust clutches on the tight side in order to allow for careless or unintelligent handling, and as the few have to suffer for the faults of the many it will certainly pay the few to follow "Chinook's" advice and make what improvement they can.

To go a little further into the clutch question, I have always found the Sturmey-Archer with cork inserts capable of extremely good results. I understand that the use of cork is now abandoned (why, I cannot imagine), but if any of your readers can give me any reason I should be greatly obliged, for it might lead me to make further alterations to the clutch I have in use at the present time.
Coventry.
SPRING.

ONE-LEGGED RIDERS.

Sir,—I see sometimes in your columns accounts of how various one-legged riders have modified standard machines in order to get over their disability, and thought that my experience might be of help to others who, like myself, are disabled in the right leg.

Owing to "Jerry," my leg is quite stiff at the knee, and it is thus essential to have the right footboard much further forward than is common practice. I managed this on my A.J.S., which, by the way, I have no right foot controls, and is, therefore, eminently suitable for my purpose by removing the footboard, which is secured by two bars running under the crank case through eyes on the under-side of the board, and replacing it so that the rear eye and the front bar engage, the board being kept in position and tilted at an angle by a metal strap connecting the rear bar and the under-side of the footboard.

This, I find, gives a very comfortable riding position, and is an excellent support for my leg, since the angle at which the footboard is tilted can be altered by fitting a longer or a shorter strap.

The whole alteration can be carried out by any amateur, since it is only necessary to drill out one hole in the metal strap to take the screw which secures it to the footboard, and to bend the other end into a loop to fit over the rod referred to above.

Wimbledon.

B.T.P.

LIVE AND LET LIVE!

Sir,—Re the article under the heading of "The Youthful Motor Cyclist" in your issue of June 19th. I feel, as a youthful motor cyclist myself, with considerably over 20,000 miles to my credit, that I cannot let this go by without some criticism.

In the first place, your correspondent advocates fitting an exhaust system that will produce the maximum amount of noise. Does he consider this is decent behaviour, taking into account the danger and annoyance caused to other users of the road by this disgusting and ungentlemanly practice, which is calculated to get motor cyclists as a whole into disrepute with the general public and police?

Secondly, your correspondent remarks that a small workshop with lathe, etc., is desirable. This is quite unnecessary. The modern motor cycle is consistently reliable, and only requires such simple operations as decarbonising, etc., very occasionally. It is pure folly to mess and tinker with valve settings, etc., as the makers probably know more about them than amateurs. Thirdly, the real joy of motor cycling lies not in making a nuisance of oneself, but in touring and seeing as much as possible of this beautiful country that we live in. In conclusion, I may state that I sometimes meet such as your correspondent, dressed up in racing helmets and other ludicrous atrocities, imagining they are going a terrific speed, and they seem somewhat surprised when my five-year-old Scott sweeps past them with nothing more than a low hum.
Edgbaston.
CONSIDERATE.

DUAL-PURPOSE MOTOR CYCLES.

Sir,—I note with interest the letter of Mr. N. H. Kettlewell with reference to my appreciation of the design of the A.B.C. I do not wish to insinuate anything, and so I feel bound to reply to his letter and say that, in my humble opinion, the A.B.C. appears to be the nearest approach to the ideal for either solo or sidecar work.

My reasons are as follows: Though of very moderate weight the engine develops ample power; a four-speed gear is provided and the machine is sprung fore and aft; moreover, owing to the disposition of the cylinders, the cooling ought to be distinctly better than any other air-cooled machine that I know of. This, of course, is a very important point for sidecar work. Every motor cyclist knows, of course, that there are many suitable machines for both purposes, and the writer would be the last person to suggest that there were not; but the ideal is quite another thing, and I feel fully justified in spite of Mr. N. H. Kettlewell's remarks in expressing my opinion. I do not for a moment despise other machines.

Pennith. GEORGE TAYLOR, A.M.I.A.E.

BAKING THE SPARKING PLUGS.

Sir,—I am interested in "Ixion's" remarks on the subject of baked sparking plugs, especially in view of experiences of my own.

During the winter of 1915 I happened to be the engineer on a 75 h.p. six-cylinder Thornycroft motor boat. The engines on the earlier types of these boats and the one I was on were absolutely exposed to the weather, and though I did my best to protect mine with canvas from damp and wet, yet, with a cold and misty morning, which is of frequent occurrence by the sea, starting up in the ordinary way was impossible. Therefore, I used to take out the plugs, put them in a tray of petrol and bake them, and four times out of five a start was effected. In the fifth case all the wiring and coil, dual ignition being fitted, had to be removed and baked in an oven. The earlier Sunbeam aero engines, fitted with air compressor starting, used to suffer on damp mornings in much the same way. To my way of thinking, there is no special technical point attached to baking plugs other than the point that baking dries the plug throughout, and, should the interior of the engine be slightly damp, the plug keeps its points clear of moisture long enough to get the engine firing. RIF-RAF.

COURTESY ON THE ROAD.

Sir,—As an old reader of your paper and a motor cyclist for nine years, I should like to supplement the information given on June 5th in a letter from "AH1707." I am a native of the village of which he speaks, and myself went to his aid and tried to get the Harley-Davidson running, but his magneto had taken a fancy to water. I then offered to take the valve cap out of the Morgan and remove the plug, which they could not remove only by the aid of a vice. I also offered the use of two spare plugs, but was told they were faulty, so I left the Morgan and went to the aid of another in trouble. I have since fitted one of the plugs in my own machine, and it runs perfectly. I, as an old motor cyclist, make a practice of carrying one or two spare plugs, and I have always been able to continue my journey, if one has given out. JAMES. Shipley.

Sir,—It seems to me that some people have a curious idea of what they call "courtesy" on the road. Your correspondent "W.W.B.," in *The Motor Cycle* of June 12th, surely shows discourtesy to other motor cyclists

who do not stop when he has a puncture by the tone of his letter about them.

Personally if I have a puncture I get on with the job, and do not expect all and sundry who pass to stop and do the job for me. If I have real trouble I simply put up my hand to the first passing motor cyclist, and I have never seen one refuse to stop when hailed. When I first started motor cycling I often used to stop when I saw fellow riders at the side of the road, but I nearly always received the same answer, "no thanks, old chap," and so I dropped it and now do not stop unless signalled. Supposing everybody took "W.W.B." at his word when next he had a puncture, say, just outside Brighton on Saturday afternoon. I am afraid he would soon be like the General who always took the back streets because his arm got tired returning salutes. Perhaps he is thinking of the "old time" courtesy when motor cyclists were few and far between, and one would invariably stop when one saw someone broken down, but in these days I hardly think it is practicable.

There is one suggestion I would like to make on this matter. Why not have a signal of distress?

If a man has a breakdown and requires assistance, all he need do is to tie his white handkerchief to the off side end of his handle-bar. Not necessarily in the form of a flag, but just to hang straight down when tied by one corner. This would not be obtrusive, but would immediately convey to passing motor cyclists that the owner was in trouble and needed assistance. I do not think anybody would have cause to complain of the "lost courtesy of the road" if such a plan as this were advocated and spread by the motor cycling press. Perhaps you can see your way to advise such an idea in your columns. S. PERKINS.

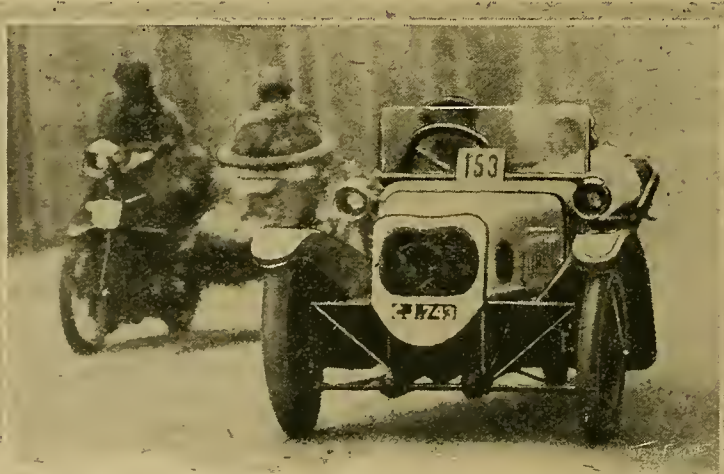
TWO-STROKES AND SCOOTERS.

Sir,—Although the two-stroke has now been used for motor cycles for some years, practically no advance has been made in design. The Tilston engine, described in your issue of May 15th, is very ingenious, but it does away with the chief attraction of the two-stroke engine, viz., simplicity. Further, we know nothing of its performance.

In your next issue (May 22nd) there appears a full-page illustration of the Precision two-stroke. In this engine use is made of the magneto chain to circulate the oil, the oil well being at the bottom of the chain case. Let us hope that this will solve the lubrication difficulty, as everyone with experience of two-stroke engines knows that accurate lubrication is a *sine qua non*, a small error one way or the other resulting in overheating in the case of under-lubrication and misfiring in the case of over-lubrication.

Some time ago I wrote to your columns suggesting an oval exhaust port, as the corners of the present rectangular type get rapidly filled with carbon deposit. The idea is to do away with these dead angles, in order to reduce the rate of deposition. We hear of streamline carburettor passages; why not streamline ports in two-stroke engines?

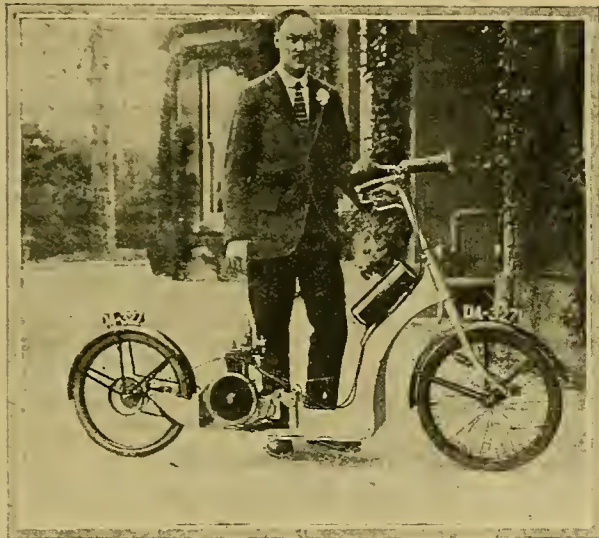
It is a pity that the best makes of motor cycles fitted with two-stroke engines now cost about as much as those of the same class having four-stroke engines. When the air-cooled two-stroke commenced to boom, it was hailed as the "motor cycle for the million," but if it is to dispossess the four-stroke advantage will have to be taken of its simplicity to offer it at a much lower figure. Let us hope that manufacturers will direct their energies towards a large production of two-stroke lightweights instead of pandering to this ridiculous motor scooter craze. P. W. HAMPTON.



The Morgan on the road during the London-Edinburgh run. This particular machine was driven by Mr. H. F. S. Morgan, who, with the four other entrants, obtained a medal.

A HOME-MADE SCOOTER.

Sir,—I enclose two photographs of a home-made scooter which is made up from an Auto-wheel, and an extra road wheel and mudguard. The frame is a single aluminium casting, the gear is $8\frac{3}{4}$ to 1, and the drive is to the back wheel by a $\frac{7}{8}$ in. Renold chain. There are three rubber buffers incorporated in the rear sprocket, and these absorb much of the shock. Both wheels are sprung through a patent system of mine, and I find it very comfortable even on bad roads. The scooter climbs very well, and I have gone from Wolverhampton to Birmingham in fifty minutes non-stop,



A home-made scooter made by Mr. B. H. Bayliss.

and successfully climbed West Bromwich Hill without personally assisting. The average speed works out at over 5 m.p.h. over vile roads. My only trouble is broken mudguard stays. The mudguards are attached to the wheels (sprung), and so get a lot of jolting. I only made the scooter for use while overhauling my car, but have quite taken to it. I understand that many scooters have been made up of Auto-wheel sets. Will others kindly come forward with photographs and compare notes?

I am an advocate of "no seat." Hoping this will interest your readers,
B. H. BAYLISS, late R.A.F.

SPARE PARTS.

Sir,—I notice in *The Motor Cycle* numerous "growls" from readers who have difficulty in obtaining parts from makers of their machines, and that they also complain of inattention to correspondence, and also the "Don't care" style of reply when it does eventually arrive. I also notice that when a complaint of this kind is published the name of the offending firm is rarely mentioned. Why not? I certainly think that if these manufacturers knew that there was a chance of their being brought to task before 100,000 readers of *The Motor Cycle* (the majority of whom "devour" its pages from cover to cover—at least I do) it would give them "furiously to think," and might induce them to get a move on.

I should briefly like to mention my experience with regard to spare parts. I have a $3\frac{1}{2}$ h.p. 1914 Sunbeam which I bought three years ago second-hand and have used with sidecar ever since—winter and summer—over very hilly country. Last year, through my neglect in not adjusting the clutch rod, I broke two teeth off one of the cogs on the layshaft. With gloomy forebodings of a long spell of waiting, I posted the damaged part to the makers, with an amount which I thought would cover the cost, on a Thursday, and you can imagine my delighted surprise when I received the new part on the following Saturday morning and I was able to put it in myself and get on the road again without missing a journey. I have since written to them for trifling items not worth their bothering about but invariably get prompt delivery and a courteous reply.

I may state that the Sunbeam is going as strong as ever. Only recently we went to the moor over the usual hilly Devon roads, having wife (112 lb.) and daughter (70 lb.) in the sidecar, another daughter (95 lb.) on carrier, and myself (164 lb.) on the saddle. How is that for a five-year-old $3\frac{1}{2}$ h.p.? I was fortunate in not meeting an inspector of the N.S.P.C.A.

I have had many offers for the outfit, at considerably more than I paid three years ago, but although I have a good six-cylinder car, I cannot yet make up my mind to part with my sturdy silent Sunbeam.

In common fairness, I have pleasure in giving my experience, and advise my fellow readers to deal with those firms who do not lose interest in their products when sold or even when purchased second-hand.

Unfortunately, for me, usual disclaimer applies.

JOHN SCOBLE.

A TABLOID HISTORY OF AIR COOLING.

Sir,—I must apologise to "Pitot" for not answering his letter of May 15th earlier—I have only just seen it.

Opinions may differ as to the best method of comparing the petrol consumption of different engines. He dislikes bench test consumptions, and prefers gallons per hour in flight at altitude. His method, unfortunately, introduces variable factors, e.g., his selected rotaries are used on small scouts with minimum load, and his selected verticals, etc., on comparatively heavy two-seaters. I should question the soundness of this method. Even if an engine of each type, e.g., a Puma and a B.R.2, were both used on the same aeroplane, e.g., a Snipe, a variable would be introduced into the comparison, as the installations would modify the machine. For these reasons, if anybody asks which type of engine is the more economical, a bench test is the only reliable standard.

If "Pitot" prefers air consumptions, he has no right to juggle with his figures. His petrol consumptions are approximately correct, but his horse-power figures are grossly inaccurate. He lists the B.R.2 as 230 h.p., which is within 4 h.p. of its maximum output; but he quotes the Puma as also 230 h.p., which is 35 h.p. below its maximum!

Again, he takes an *obsolete* Vee, the R.A.F. 3a, and compares it with the two latest rotaries.

Since he says my figures are "hopelessly wrong," I beg to inform him that I went to the pains of having them checked by the statistical section at the Air Ministry. His phrase is therefore grotesque in any case: if he had been content to say "wrong," he would have had an excuse, for they happen to be based on the latest (and previously unpublished) returns from the factories concerned.

If, by terming the "radials" unproved, he means that they were not ready for service in France last year, he is, of course, correct. But "unproved" is a strong word to use when

- (1.) They hold most records for scout performances.
 - (2.) The 1919 R.A.F. contracts were what he and I know them to have been.
 - (3.) The pilots who have flown them think so highly of them
- TORQUE.

SUMMARY OF CORRESPONDENCE.

"AN IRISH READER."—Your comments fall flat because you have failed to note the difference between % (per cent.) and ° (degrees) and have confused the two.—ED.

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SPECIAL FEATURES

NOVELTY IN COMPETITION.

OVERSEAS NOTES.

TOURING HEADQUARTERS FOR CENTRAL WALES.

TIME TO LIGHT LAMPS

SUMMER TIME.

June 26th	...	...	9.49 p.m.
" 28th	...	...	9.49 "
" 30th	...	...	9.48 "
July 2nd	...	...	9.48 "

Motor Spirit Prices.

We are notified that the retail price of Pratt's Perfection spirit is 3s. 0½d. per gallon and that of Taxibus is 2s. 10½d. per gallon.

Stolen Machine.

A new A.J.S. and sidecar were stolen from a garage in Glasgow recently—frame No. 10903, sidecar No. 1990. The owner, Mr. H. Macdonald, 86, Vincent Street, Glasgow, would be grateful for any information.

Police Activity.

The police are very active at present in Oxford. The trapping commenced early last week, and there are already over fifty cases of exceeding the speed limit. It is hoped that this word of caution may save tourists being mulcted of the value of a good many gallons of petrol.

The Arbuthnot Trophy.

There is considerable keenness among motor cyclist officers in the Royal Navy concerning the Arbuthnot Trophy Trial which will take place in the Plymouth district on July 4th and 5th. It was thought at one time that officers living at a distance would have trouble in getting leave for the event, but as the competition appears in Admiralty Orders, and will appear on every ship's notice board, it does not seem as if there will be any difficulty in this respect.

Eliminating the Time Factor in Reliability Trials.

Undoubtedly trials organisers recognise the unpopularity of the secret check and speed-judging competition as means to find a winner in reliability trials, and when the South Birmingham Club holds its open trial on July 12th the sole aim will be to eliminate the alleged weaknesses of modern motor cycles. Excepting to ensure regularity of running, timing will play a small part in the conditions. The premier award is a trophy presented by the Palmer Tyre, Ltd., while there are several other cups which will be won outright.

A large entry is expected, and intending competitors should apply early for entry forms from the hon. sec., Mr. Ernest Boydell, 93, John Bright Street, Birmingham.

A Trial for Miniatures.

On July 26th the Sutton Coldfield and Mid-Warwickshire A.C., the organisers of the popular pre-war Colmore Cup trial, will hold a trial confined to lightweights. The premier award is a trophy value 100 guineas, and was last won in June, 1914, by P. Pike, on a 1.9 h.p. Levisette. The capacity limit has not yet been settled, but this will not in any case exceed 280 c.c.

Motor Cycles for Ex-soldiers—a Government Concession.

As announced in a leaderette last week, a special concession has been granted by the Government to the War Motors Association by which ex-motor cycle despatch riders, who have served as such in any branch of the Services, are to be given first refusal of a large number of surplus Government motor cycles. The only condition attached to the offer is that the motor cycles shall not be re-sold within six months. The following machines are available immediately: Several hundred new Douglas motor cycles, in crates, at from £60 to £70; a large number of repaired Douglas motor cycles at £40 to £50; and a quantity of repairable machines at various prices.

Application should be made in the first instance to the Secretary, Auto-Cycle Union, 83, Pall Mall, London, S.W.1, stating name of unit in which applicant served, and date of discharge.

The Metropolitan Police and Motor Cycles.

Mr. Frank Elliott, Assistant Commissioner of Metropolitan Police, has stated that the question of providing London policemen with motor cycles is under consideration. The idea, we are informed, is not to use motor cycle police for catching erring motorists, as is the case in the U.S.A., but merely to facilitate journeys between various points for policemen in the Metropolitan Police Force engaged upon their various duties. The matter is an interesting one, as Mr. Elliott is himself an old motor cyclist, and in 1904 or thereabouts used, for his own pleasure, a 2½ h.p. Kerry and trailer.

Winning a Pair of Gloves.

A sidecarist garaged his machine for three days at Bournemouth. After leaving, he found a pair of driving gloves in the sidecar. He reported the find to the garage without result. Will the owner communicate with us?



The Norton "Big 4" in the stopping and re-starting test, in which it demonstrated its reserve of power and fine acceleration. (See page 635).



EFFICIENCY?



YOU WILL GET IT IN EITHER A

HENDERSON

Four-cylinder Motor Cycle

OR AN "AMERICAN"

EXCELSIOR

Twin-cylinder Motor Cycle.

DELIVERIES SHORTLY.

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MESSRS. ROBERTSONS MOTORS LTD., 157b, Gt. Portland Street, W.1, for the territory South of, and including the Counties of Cardiganshire, Radnor, Hereford, Gloucester, Oxford, Northampton, Cambridge, and the whole of IRELAND

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More Sunbeam Successes

at Whitsuntide.

London—Edinburgh Trial.

NINE GOLD MEDALS.

The *Motor World* says:—"The Sunbeams ran consistently and silently throughout."

The *Auto Cycle* says:—"As was to be expected, Sunbeams ran with the regularity of a train."

Liverpool Club—North Wales Trial.

2 FIRST-CLASS CERTIFICATES.

The only $3\frac{1}{2}$ h.p. and sidecar to climb all hills and finish the course was a Sunbeam.

Bristol Club—Land's End Trial.

GOLD MEDAL.

Birmingham—Land's End and Back

(605 miles double journey)

4 SUNBEAMS QUALIFY FOR THE TROPHY.

Edinburgh Motor Club's Sporting Trial.

Motor Cycling says:—"The half-day Trial held by the Edinburgh Motor Club was the most strenuous test that has ever been held in one day in Scotland. The results amply bear out this view. Sixty-two started and only nine reached the finish with clean sheets. Perhaps the $3\frac{1}{2}$ h.p. Sunbeam and sidecar made the most noteworthy performance in the trial, ascending all hills in fine style and being up to time at all checks."

These facts speak volumes for the power of the Sunbeam Engine and the Perfection of the Sunbeam Oil Bath Chain Transmission.

JOHN MARSTON Limited, 11, Sunbeamland, Wolverhampton.

London: 57, Holborn Viaduct, E.C.1.—157, Sloane Street, S.W.1.

Nottingham Trial.

The trial for the Dennis Bayley challenge cup was run off by the Nottingham and District Motor Cycle Club on Saturday last, with the following results: Winner, S. S. Debenham (8 Champion); gold medal, R. McPherson (Rudge-Multi).

Atlantic Flight Hero.

On Saturday evening Capt. Sir J. Alcock was a guest at an informal dinner given by the Bristol club. The Lord Mayor was in the chair, and in a short speech he referred to the manner in which Sir John had set out to face the unknown, the same as had Sebastian Cabot, who sailed from the port of Bristol in 1497, and discovered the mainland of North America.

The Sheffield-Holyhead Trial.

Only nine members of the Sheffield and Hallamshire Club competed last Saturday in the trial to Holyhead and back for the Hilton Shield. The roads were good, and on the whole the machines ran well. The following finished: S. Sawyer (4 Norton sc.), E. H. W. Hoyland (4 Norton sc.), J. Haslam (4 Douglas sc.), D. Kaye (4 Triumph), F. James (8-10 Morgan), and A. Blake (8-10 Morgan).

The Arbutnot Trophy.

The Motor Cycling Club has decided to offer a prize for the best performance of the rider of a solo machine in the Arbutnot Trophy competition, run by the Auto-Cycle Union.

It is extremely gratifying to see that the M.C.C. is paying this tribute to the memory of its late distinguished member, who took so keen an interest in the club's competitions. The entrants so far are as follow:

1. Sub-Lt. G. F. N. Tollock, R.N. (8 Harley-Davidson)
2. Maj. W. Patrick Arbutnot, R.M.L.I. (6 Enfield)
3. Sub-Lt. R. N. Everett, R.N. (4 Triumph)
4. Lt. C. F. H. Marriott, R.N. (4½ B.S.A.)
5. Lt.-Com. T. F. C. Phillips, R.N. (A.J.S.)
6. Lt. R. C. Hovenden, R.N. (Norton)
7. Lt. S. E. P. Hutton, R.N. (Rudge Multi)
8. Lt. Victor Bellord, R.N. (Triumph)
9. Lt. Dennis H. Griffiths, R.N. (Norton)
10. Lt. Terence H. Back, R.N. (Triumph)
11. Lt. C. J. M. Samuelson, R.N. (Levis)
12. Lt. W. W. Jacob, R.N. (5-6 James)
13. Sub-Lt. W. F. Jameson, R.N. (—)
14. Lt. E. S. K. Evans-Greaves, R.N. (4 Triumph)
15. Sub-Lt. G. P. Glen-Kidston, R.N. (3½ Sunbeam)
16. Lt. W. Derek Stephens, R.N. (3½ Douglas)
17. Sub-Lt. C. P. Laurie, R.N. (P. and M.)

Junior Car Club Hill-climb.

The Junior Car Club held a most successful competition at South Harting on Saturday. The most interesting machine present was Capt. Nash's racing G.N., the aluminium body of which was the true Brooklands type.

Class 1, for three-wheelers of 1,100 c.c., was a walk-over for F. J. Findon on an 8 Morgan. In Class 2, Capt. Nash gained a first on time, with the G.N.'s of C. Finch, and Capt. Ogilvie second and third.

Class 6, for racing three-wheelers of 1,100 c.c. saw Major A. C. Hardy's 8 h.p. G. P. Morgan first, with F. G. Layzell second.

Class 7, for racing cars up to 1,100 c.c., was won easily by Capt. Nash on the G.N. both on time and formula, while on time H. R. Godfrey was second on a G.N., the two A.V.'s making good climbs.

The last racing class for machines up to 1,500 c.c. went to Godfrey's G.N. on time,

The Purchase of Motor Cycles by the War Office, 1914-1918.

The following is the number of motor cycles purchased by the Government from the beginning of the war up to September 30th, 1918:

SOLOS.			
Triumph	...	...	6,290
Douglas	...	...	6,998
Clyno...	...	...	191
Enfield	...	...	14
Rudge	...	...	141
Zenith	...	...	220
			13,854
SIDE CAR OUTFITS.			
Douglas	...	...	1,180
Clyno...	...	...	733
B.S.A.	...	...	546
			2,459

The figures have reached us from the Assistant Director of Mechanical Transport at the War Office, and do not include the P. and M.'s of the Flying Corps.

Average Prices.

Three more Government sales were conducted last week by Messrs. Goddard and Smith on Tuesday, June 17th, Thursday, June 19th, and Friday, June 20th, respectively at the Agricultural Hall, Islington.

The surplus Army machines offered for sale during the week consisted of a large number of new 2½ h.p. Douglasses, a smaller number of old machines, both 2½ h.p. and 4 h.p. of the same make, in various stages of decay, and many war-worn 4 h.p. Triumph motor cycles. New 2½ h.p. Douglas machines fetched sixty-seven guineas, sixty-eight guineas, and sixty-nine guineas. The old 2½ h.p. Douglas machines were in various stages of wear, and the prices realised for them differed accordingly, being forty guineas, thirty guineas, and nineteen guineas.

The 4 h.p. Douglasses realised from

forty guineas to forty-five guineas for the better machines, thirty guineas, and from twelve guineas to twenty-two guineas being paid for the second and third-class mounts.

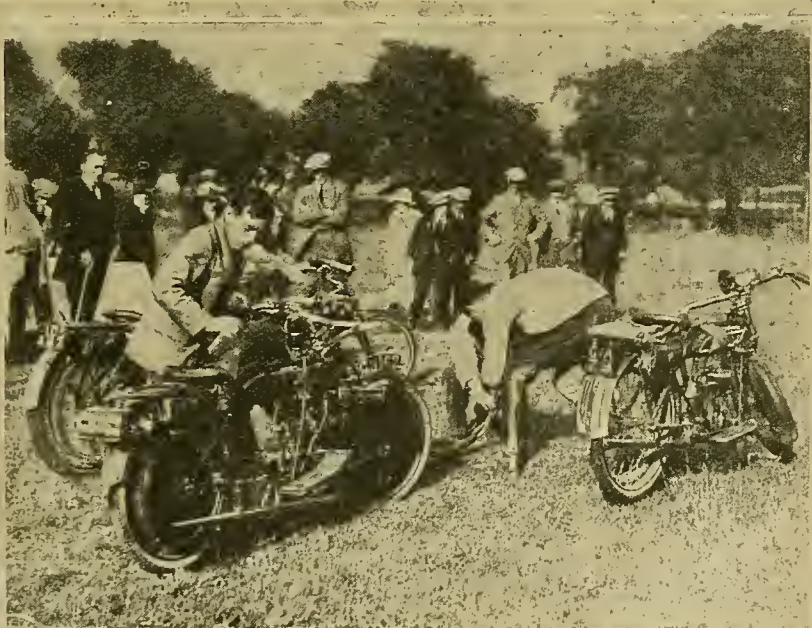
The 4 h.p. W.D. pattern Triumphs produced keen competition, and realised an average price of forty-eight guineas.

The War Motors Association.

WE recently had an interesting conversation with Captain W. B. Shepherd, M.C., organising secretary of the War Motors Association, 240, High Holborn, London, W.C.2. The *raison d'être* of this Association was dealt with in an editorial in last week's issue, which, we may remind our readers, is for fulfilling the important duty of rendering it possible for ex-soldiers and sailors, whether officers or men, to purchase Government motor cycles at a reasonable figure.

For this purpose the Government has allotted a certain proportion of the motor cycles it has for disposal. The first consideration will be given to the man who needs a motor cycle in business. To purchase a motor cycle he must make application through the secretary of the Auto Cycle Union, 83, Pall Mall, London, S.W.1, and must present his discharge papers as a sign of *bona-fides*. People who have received grants from the King's Fund for Disabled Men, or those who have received other Government grants, will be glad to avail themselves of the facilities offered. The War Association saves a man from going to an auction or a dealer to buy a machine, as it has been found that at the average auction a ring of buyers is frequently encountered, which do not allow the ordinary individual a chance of obtaining a machine at a reasonable figure.

Capt. Shepherd is himself a motor cyclist, and has the interest of the ex-Service motor cyclist thoroughly at heart.



Glasgow M.C.C. Gymkhana held last Saturday before a large crowd. H. G. Deas (2½ h.p. New Hudson) and R. H. Lockhead (2½ h.p. New Imperial) in the "belt" competition.

A WEST-COUNTRY RALLY.

Bristol entertains A.C.U. Committee.

Inspection of the Douglas Works.

Successful Gymkhana at Ashton Court.

IF justification were needed for the new policy of the A.C.U. in holding its meetings at different centres, the success of the Bristol meeting provides it. At no time has the Auto Cycle Union had such a well attended committee meeting—nor such a representative one. This was held last Friday, and to it members of the committee journeyed from as far North as Sunderland, and from London, Liverpool, Manchester, Birmingham, Coventry, and other centres in order to represent their "constituents" at the motor cyclists' parliament.

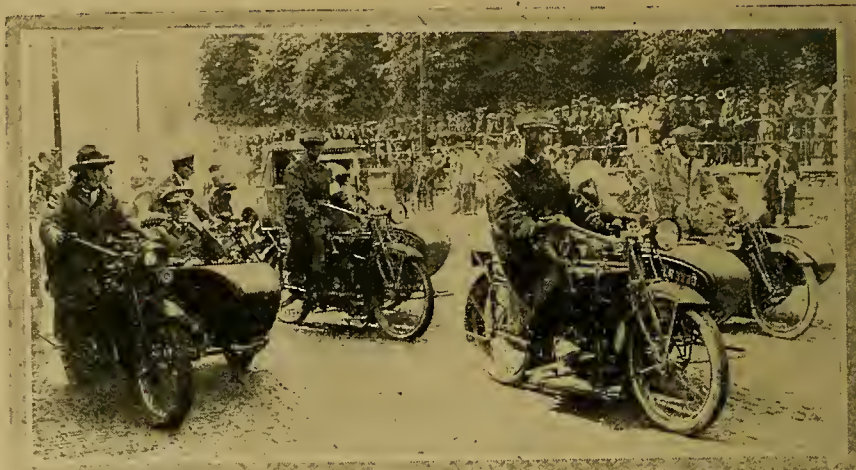
The committee meeting was held in camera, but it was obvious to the most casual observer that a new enthusiasm animated the A.C.U. committeemen who invaded the Grand Hotel.

As frequently pointed out in *The Motor Cycle*, provincial motor cyclists before the war regarded the A.C.U. as a London organisation run by Londoners for Londoners. This feeling has changed. The A.C.U. is now regarded as a national institution, and in truth becomes the motor cyclists' parliament, representing 32,000 riders who support it, and considerably over a further hundred thousand who do not.

Large as is the present number of members, half of whom have joined this year, it should be larger, and without doubt such events as that which we attended last week at Bristol will go a long way toward securing the support of those who at present allow others to fight their battles for them.

Lavish Hospitality of Bristol.

Bristol has always been a hospitable city. The committee of the A.C.U. knew this before their visit, but it is doubtful whether any one of the visitors expected quite such a hearty welcome as that arranged for them by the Bristol Motor Cycle Club.



The interest of the public in motor cycles was exemplified at Bristol last Saturday, when the A.C.U. committee were entertained by the West of England club.

At nine o'clock on Saturday morning over forty Douglas sidcar outfits were lined up before the hotel entrance. Each was numbered, and delegates and pressmen were allocated machines, which they were to regard as their vehicles for the day. These machines were driven by members of the club, officials of the Douglas works, and Douglas testers, and were, with one exception, standard 4 h.p. models.

At 9.30 a.m. the long line of machines moved off in single file, and threaded its way through the traffic of the narrow crowded streets of the city to the Douglas works at Kingswood. Here they were met by the principal of the famous Bristol firm, who, to emphasise the hospitality of his city, threw open the works for inspection.

There was more than hospitality in this share of the city's welcome to the visitors. Among the delegates were the heads and designers of several contemporary firms, and this broad-minded action on the part of Messrs. Douglas Motors, Ltd., set a precedent of what, in future years, may become general practice. It was exceedingly pleasing to us to see this whole-hearted invitation to all interested in the development of the motor cycle, for such visits must ultimately be of great benefit to all concerned in the production of motor cycles in particular, and to the field of British engineering generally.

The visitors were piloted through the works in parties by the works manager, and were shown Douglas motor cycles in every stage of construction. The works



Four companies of the 1st Motor Battalion, Machine Gun Corps, at attention in the Bristol Rally.



The Gymkhana at Ashton Court Park. (Left) A competitor in the "long jump" competition. (Right) Tilting the ring.

have been greatly extended during the war, and equipped with magnificent plant.

After the tour of inspection, it was suggested that it would be fitting to take away as a memento one of the hundreds of machines which had been inspected, and two energetic committeemen immediately interviewed the sales manager, Mr. Rossiter, with whom terms were arranged. A new 2½ h.p. model was brought out of the stock room to be "raffled," and the long queue obtaining tickets rivalled that for a "first night."

The Official Luncheon.

The Lord Mayor of Bristol (H. W. Twiggs, Esq.) with his chain of office now arrived in his state carriage, with footmen in scarlet livery, and was received by Mr. W. Douglas, sen., who made the usual introductions. The party were then conducted to one of the large mess rooms and entertained to lunch by Douglas Motors, Ltd., after which came the usual speeches, when the Lord Mayor referred to the present and potential popularity of the motor cycle, paying tribute to the A.C.U. and all motor cyclists for their share in developing the machine. The war, he said, had been won by the internal combustion engine.

Mr. W. Douglas, sen., Mr. J. R. Nisbet (chairman of the A.C.U.), Mr. T. W. Loughborough (the secretary of the A.C.U.), Capt. Philip Grout (the captain of the Bristol M.C.C.), Mr. S. L. Bailey, and others also spoke.

The function terminated with the Lord Mayor drawing the prize winner in the raffle. Amid silence this was done, and the name read out was that of Mr. E. B. Ware, of J.A.P. engine fame.

The afternoon part of the programme commenced with a return in the Douglas sidecar convoy to the city, where, at College Green, the visitors were met by the local motor cyclists. Before the cathedral four companies of the Motor Machine Gun Corps stood at attention. This company, commanded by Maj. B. Arthur, D.S.O., consisted of eight Clyno sidecar gun carriages, mounted with Vickers machine guns, eight spare carriages, eight ammunition carriages,

four section officers, and four scouts mounted on 1916 4 h.p. Triumphs.

The Bristol club officials now led the way to Clifton Downs, and the long line of motor cycles with the machine guns practically encircled the Downs, where they exemplified the utility of the motor cycle in peace and war.

No more charming a spot can be imagined than the sea wall at Clifton Downs. In brilliant sunshine the visitors disembarked to admire the scene, and after a short stay proceeded across Clifton Suspension Bridge to the beautiful Ashton Court Park for the gymkhana. Here several hundred other motor cyclists welcomed the party, and the sports commenced. The events included a slow race, tilting the ring, musical chairs, long jump, and obstacle race, after which the Motor Machine Guns gave an interesting display. The winners of the various events are as follow:

- SLOW RACE**
1. H. Thorpe (Douglas).
2. G. F. Tozer (2½ G.K.).

MUSICAL CHAIRS.

1. A. Phipps (4 Douglas), Miss Tozer passenger.
2. Mr. and Mrs. Howell (5 Brough sc.).

LONG JUMP.

1. Lt. Bradshawe (4 Triumph), 27ft.

OBSTACLE RACE (Solo).

1. Lt. Bradshawe (4 Triumph).
2. E. G. Ferry (2½ Douglas).

SIDECARS.

1. W. King-Smith (8 Harley-Davidson).
2. Rex Mundy (8 Matchless).

The arrival of Capt. Sir John Alcock, fresh from his investiture, in a Douglas light car, was the signal for a general rush to the Lord Mayor's carriage, where for a moment he was seen receiving his lordship's congratulations. After that he was lost in a surging crowd of admirers.

Altogether the Bristol M.C.C. are to be congratulated upon the splendid organisation which permitted them so thoroughly to entertain the A.C.U. Every credit is due to Messrs. S. L. Bailey, J. Cates, and A. Tozer, who were responsible for an event which has set a difficult standard for other centres to follow—and, incidentally, given the A.C.U.—and consequently the pastime generally—a filip which is bound to have a beneficial effect.



THE
BRISTOL
RALLY.

The A.C.U. committee in a convoy of Douglas sidecars.

A Sporting Trial in Scotland.

A Successful Competition of an Unusually Severe Nature. Of Sixty-four Starters only Eleven Finished.

THOUGH stated not to be a freak course, the route chosen by the Edinburgh M.C. for its recent trial was particularly severe.

The course consisted of close upon ninety miles over mountainous country—creating at first a happy impression, which rapidly receded as the day advanced. The last sixty miles left an impression of watersplashes, hairpin bends, steep gradients, loose sandy surfaces, gates, rocks, and countless observers. There were seven observed hills, and each one took its toll, so that when once the wild country was struck the weeding-out process proceeded very rapidly. The entries included many novices—one lady rider of a 3 h.p. Enfield and several school boys, who certainly made up in keenness what they lacked in experience.

The first observed hill was at Dunsin, a steep gradient in a wooded valley, and quite invisible till, coming round a blind corner, one finds oneself confronted by the ascent. Though not very long, the worst gradient is about 1 in 4, and is met, as is general, at a difficult corner. Here, C. R. Duncan (2½ Douglas), J. Beck (3½ Sunbeam sc.), C. S. Burnley (4 Blackburn), Arkman Smith (3½ Scott), C. Lawson (4½ B.S.A.), J. W. Hutchinson (7-9 Harley sc.), J. R. Alexander (6 Enfield), W. S. Miller (3½ P. and M.), and Wm. Frayeur (8 Sunbeam sc.), all made excellent ascents, while A. W. Beaton (8 Matchless sc.) took the hill at exceedingly high speed—too fast for reliability. H. G. Walker (3½ New Hudson) stopped, but made a good restart; while C. C. Mitchell (6 Enfield sc.), T. K. Bonnar (3½ single-speed Triumph), and J. W. McFarlane (3½ Norton), “konked out.” P. Douglas (7-9 Indian sc.) failed early in the ascent, and caused some excitement by running backwards and capping his outfit, the sidecar emptying its contents—a tea basket and tools—on the head of the ejected passenger.

Among the Hills.

The hills now came into view, and, after two difficult water splashes, Redstone Rig, one of the most difficult hills of the day, was approached. It is a hill of rather over a mile in length, gradually becoming steeper and looser till, at the crisis, two difficult corners are struck. At the top of the hill was located the first check, so that those ahead of time had an opportunity of cooling before tackling the gradient. Being unfamiliar with the course, however, few were able to profit by possibilities of this kind.

Redstone Rig.

Having watched most of the competitors mount at Dunsin, we managed to arrive at Redstone Rig to observe the tail end of the procession. Frank Smith,



Edinburgh M.C.C. open trial. Despatching competitors after tea from the check on Snout Hill.

piloting his Clyno outfit, came crawling silently up the worst part of the gradient, murmuring that he was ahead of time and enquiring as to the position of the check! R. Boyack (7-9 Bat) made an exceedingly fast ascent—a performance he repeated on all the open hills. J. Johnson (4½ B.S.A. sc.) climbed well, as also did Duncan Bell (6 A.J.S. sc.), A. Bonvill (2½ A.J.S.), and J. Madden (6 A.J.S.), J. H. Balfour (4 Norton), and A. L. Clark (4 Triumph). Hutchinson (Harley sc.) was baulked, but restarted well; Grinley (New Hudson) was also baulked. H. Alexander (4 Douglas sc.) made a fast and silent ascent of all hills.

The succeeding twenty miles, via Gartvald, Stenton, Pilcox, Spott, and Elmsleuch presented many trials in the way of surface and corners, and the competitors experienced much difficulty in holding their 20 m.p.h. average. There were a few spills, but nothing very serious.

Rapid Elimination.

There followed two observed hills in quick succession, namely, Elmsleuch and Crickness, the latter being the East Lothian test-hill, immediately after which the non-stop section began, terminating at the tea control.

The next check and control was at the summit of Snout Hill (observed), a breezy upland spot, where tea was taken, and where many motorists were present. This hill begins with a watersplash, and is of considerable length, and of exceedingly difficult gradient and surface. J. R. Alexander (6 Enfield sc.), A. B. Bruce (6 A.J.S. sc.), A. H. Alexander (3½ Douglas)—who, by the way, is enthusiastic as to the properties of the Douglas spring frame—all did exceedingly well; while the Bat riders and Beaton (8 Matchless sc.) again came up at speed.

After tea the process of elimination proceeded very rapidly. Continuing to Donnally Burn we found Arkman Smith (3½ Scott) emerging from a collision with one of the sidecars. His frame was badly twisted and his low gear rendered inoperative, which was hard lines, since he had ridden well; but he pluckily finished the event.

Reservoir Hill and Slade Hill were more by way of being driving tests than anything, both containing hidden hairpins on their steepest and loosest portions, and the last named accounted for no fewer than

sixteen failures among the few survivors! We noticed one Harley-Davidson travelling at speed with a broken sidecar coupling, while another, in the midst of a fine ascent, suddenly stopped down with gear box trouble—apparently seizure. Several riders crashed on one or the other of these hills, and so spoilt their sheets, after which came a clean straight run back to Siberton.

The following competitors got through without loss of marks—truly a worthy performance:

Jas. Beck (3½ Sunbeam sc.)
C. S. Burnley (4 Blackburn).
W. B. Fenwick (6 Rover sc.)
W. S. Miller (3½ P. and M.)
J. R. Alexander (6 Enfield sc.)
A. B. Bruce (6 A.J.S. sc.)
A. H. Alexander (3½ Douglas).
J. Armstrong (8 Enfield sc.)
Duncan Bell (6 A.J.S. sc.)
J. W. Anderson (8 Bat sc.)
Frank Smith (8 Clyno sc.)

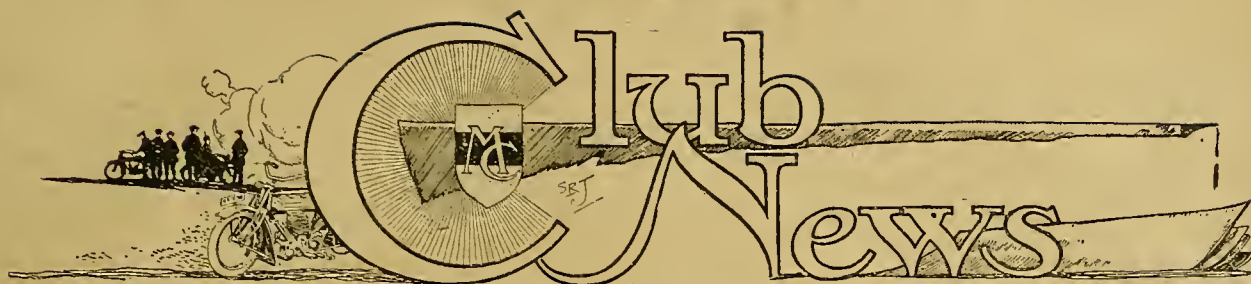
It will be observed that only three solo riders out of thirty and eight sidecars out of thirty-one are mentioned. All the survivors surmounted very great difficulties, but Beck (3½ Sunbeam sc.) and Burnley (4 Blackburne) undoubtedly put up the surprise performances of the day. They held Nos. 1 and 2, and kept together dead on time throughout the event.

In addition to the ordinary medals, the Palmer Tyre, Ltd., is presenting a pair of tyres for the best performance by a competitor who has not previously competed in any event.

The organisation of the event was excellent throughout, and Messrs. Macrae and Hutchinson, with whom the responsibility mainly rests, are certainly to be congratulated on the results. The weather was perfect, and the whole event proved most enjoyable and interesting.

SCOTTISH SIX DAYS TRIALS THIS YEAR.

AT the beginning of the week a wire reached us to the effect that the Scottish Six Days Motor Cycle Trials will be revived next month. The date selected is July 21st to 26th, and the conditions governing the trials, as well as the route, remain approximately the same as in 1914. The Edinburgh and District Motor Club is, of course, the organising club, and Mr. Campbell McGregor, 6, Castle Terrace, Edinburgh, has the arrangements in hand.

**Liverpool M.C.**

The speed trials at Colwyn Bay announced for July 12th have been postponed.

Launceston M.C.C.

All motor cyclists residing in the district round Launceston interested in the formation of a motor cycle club should communicate with Mr. Maurice Prout, Creathorne, Launceston.

Western M.C.C. (Glasgow).

With the exception of the results of Class 2, the first and second place winners given in last week's issue have been confirmed by the committee. Class 2 results are: 1, W. Deans (3½ h.p. Ariel), figure of merit 181; 2, J. Spence (4 h.p. A.J.S.), 172.

South Birmingham M.C.C.

It will be recalled that the winners in the recent South Birmingham M.C.C. trial were first announced as: 1, L. Newey; 2, G. Dalby; 3, T. Stevens. Then, owing to a protest, the positions were altered to: 1, T. Stevens; 2, L. Newey; 3, G. Dalby. We understand the protest was not upheld by the committee, and that the positions of the first three are as originally announced:

1. L. Newey (3½ Ariel).
2. G. Dalby (4 Triumph).
3. T. Stevens (4¼ James sc.)

Larne and District M.C.C.

The first social run of the above club was held on Saturday, June 14th. A start was made from the Laharna Hotel, the destination being Ballymena and Carnlough. There was a good turnout of members, the sidecarists, as usual, being in the majority.

It is hoped by the members that the enterprising secretary and captain will arrange for many similar runs during the summer months and that all motor cyclists in Larne and district will take advantage of these social runs.

The best thanks of the club members are due to Mr. Cameron, the father of motorising in Ballymena and district, for his advice regarding the running of the club.

North Cheshire M.C.C.

It has been arranged that the opening run of the above club shall take place on the 29th, at 2-15 p.m. sharp, meeting place Trafford Hotel, Alderley. A social run to Rudyard Lake has been planned, where tea and boating have been arranged for. It is hoped there will be a large attendance—all motorists are cordially invited. There is a trophy for the smartest "turnout." The hon. sec., Mr. W. R. Eadington, London Road, Alderley Edge, will be pleased if all intending to be present will notify him as to the number of seats they require for tea, weather permitting.

Future Events.

JUNE 27-28.—LIVERPOOL M.C. TWENTY-FOUR HOUR TRIAL TO EDINBURGH.
JUNE 28.—York and District M.C. Week-end Run to Bridlington.

JUNE 28.—BIRMINGHAM M.C.C. SPEED TRIALS.

JUNE 28.—LIVERPOOL M.C. TWENTY-FOUR HOUR TRIAL TO EDINBURGH.

JUNE 28.—M.C.U. OF IRELAND, ULSTER CENTRE, RELIABILITY RUN.

JUNE 28.—MIDLAND C. AND A.C. RELIABILITY TRIAL.

JUNE 28.—Western M.C.C., Glasgow. Old Crook Test.

JUNE 29.—N.M.C.F.U., Leeds. Run to Malham-Skipton.

JUNE 29.—Rochester, Chatham, and District M.C. Inter-club Meet with Woolwich and Streatham Clubs.

JUNE 29.—N.M.C.F.U. (Wolverhampton). Social Run to Milford, near Stafford.

JUNE 29.—Taunton and District M.C.C. Run to Cheddar.

JUNE 29.—Essex M.C. Picnic on Dunstable Downs.

JUNE 29.—Ilkerton and District M.C.C. Run to Dovedale.

JUNE 29.—S. Birmingham M.C.C. Run to Tewkesbury.

JUNE 29.—Eastern Counties M.C. Run through Hertfordshire Lanes.

JUNE 29.—N.M.C.F.U., Sheffield. Week-end Run to Bridlington.

JULY.—MIDDLESBROUGH AND DISTRICT M.C.C. 200 MILES RELIABILITY TRIAL FOR GJERS AND NEW HUDSON CUPS.

JULY 2.—MIDDLESBROUGH AND DISTRICT M.C.C. RELIABILITY TRIAL FOR GJERS CUP.

JULY 3.—Taunton and District M.C.C. Reliability Trial.

JULY 4.—5.—ARBUTHNOT TROPHY TWO DAYS TRIAL, PLYMOUTH DISTRICT.

JULY 5.—M.C.C. Hill-climb.

JULY 5.—Birmingham M.C.C. Social Tour.

JULY 5.—Streatham and District M.C.C. Members' Reliability Trial.

JULY 5.—Wolverhampton M.C.C. Half-day Reliability Trial.

JULY 6.—Wolwich, Plumstead and District M.C. Picnic Run to Toy's Hill.

JULY 6.—Western M.C.C., Glasgow. Run to Clovenfords.

JULY 6.—Nottingham and District M.C.C. Inter-club Run with E. Midland Associated Clubs.

JULY 6.—OLDHAM AND DISTRICT M.C. RELIABILITY TRIAL.

JULY 12.—LIVERPOOL M.C. RACES AT COLWYN RAY.

JULY 12.—WOLVERHAMPTON M.C.C. OPEN TRIAL.

JULY 12.—Motor Cycling Club. "Touch Nothing" Run.

JULY 12.—Western M.C.C. Team Trial.

JULY 12.—SOUTH BIRMINGHAM M.C.C. OPEN TRIAL.

JULY 12.—Motor Cycling Club. Hill-climb.

JULY 13.—Wolverhampton M.C.C. Social Run to Stratford-on-Avon.

JULY 13.—M.C.U. OF IRELAND, ULSTER CENTRE, IRISH END-TO-END RELIABILITY RUN.

JULY 16.—York and District M.C. Reliability Trial.

JULY 19.—Middlesbrough and District M.C.C. Sidecar Competition.

JULY 19.—Sutton Coldfield and Mid-Warwickshire A.C. Open Hill-climb at Stile Cop, near Rugby.

JULY 19.—BIRMINGHAM M.C.C. MIDLAND CUP TRIAL.

JULY 20.—Nottingham and District M.C.C. Run to Donnington.

JULY 23.—ESSEX M.C. SPEED TRIALS AT SOUTHEAST.

JULY 23.—ESSEX M.C. SPEED TRIALS WESTCLIFF-ON-SEA.

JULY 26.—Sutton Coldfield and Mid-Warwickshire A.C. Lightweight Trial for Calthorpe Cup.

JULY 27.—Streatham and District M.C.C. Picnic Run to Ashdown Forest.

AUG. 16.—S.E. COUNTIES INTER-TEAM TRIAL.

SEPT. 5.—M.C.C. TEAM TRIAL FOR "THE MOTOR CYCLE" CUP.

SEPT. 15-20.—A.C.U. SIX DAYS RELIABILITY TRIALS.

Manchester Wheelers.

There will be an obstacle race for motor cycles included in the programme of the Manchester Wheelers 32nd race meet at Fallowfield on July 12th. Motor cyclists desirous of entering should apply to the race meet hon. secretary, Mr. F. T. Guildford, at the Clubhouse, South King Street, Manchester.

Camberley and District M.C.C.

After four years of enforced suspension an effort is being made to revive the Camberley and District Motor Cycle Club. Any old member, or others, desirous of joining should communicate with the hon. secretary, Capt. W. J. King, "Peveril," Lower Gordon Road, Camberley.

Shetfield and Hallamshire M.C.C.

The members of the above club recently met at Cowdale, Ashwood Dale, near Buxton, for a weight-carrying competition up the A.C.U. 1914 freak hill. A fair number turned up, and a very keen contest took place, the loads being composed of men and boys. The final three were G. W. Wilkins (5 h.p. Brough) carried five men; B. H. Eccles (4 h.p. Norton), four men and one boy; — Goulding (4 h.p. Douglas), four men.

The First Post-war Speed Trials.

On July 23rd the Essex Motor Club will hold their speed trials at Westcliff-on-Sea. There will be two principal events, i.e., one kilometre flying start and the one kilometre standing start, and in addition to car classes there are no fewer than eighteen types of motor cycles catered for.

"Standard touring machines" must be as per manufacturers' published price lists, except that wide or dropped handle-bars will be permitted. Lamps need not be fitted, but toolbags with tools and motor cycle horn must be carried.

In all passenger classes the weight of the passenger must not be less than 132 lb.

A first prize is offered in each class, also a second prize if eight or more entries are received, and a third if twelve or more entries are forthcoming. A special prize is offered for the winner of a match between the fastest motor cycle and the fastest car.

Entries, which close on July 8th, should be forwarded to the hon. organising secretary, Mr. Harved Fuller, 51, Pulteney Road, South Woodford, E.18, who will forward entry forms upon request. The fees are as follow:

Members, 7s. 6d. each class; five for 30s.

Non-members, 15s. each class; five for 60s.

Membership of the club is: Entry fee, 7s. 6d.; subscription, 12s. 6d.

NO AGE LIMIT.

Second Batch of Letters received from Readers of Mature Years.

IN last week's issue we gave several letters from motor cyclists of mature years, and here we print several more. In addition, we have received a large number of letters from riders with slightly fewer years to their credit, which may be published at a later date.

So far, the published record is as below:

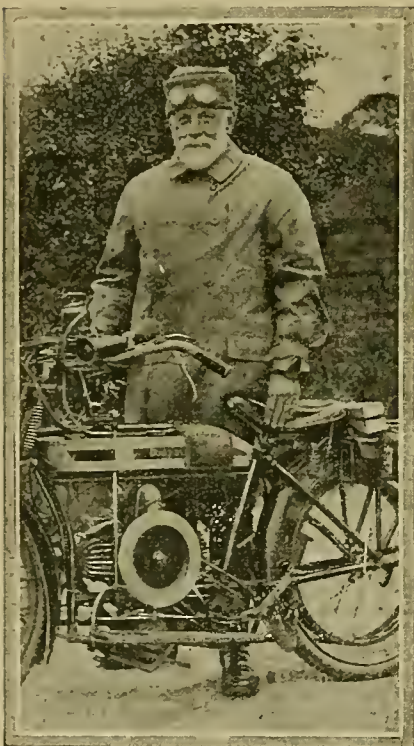
The Rev. E. W. Wilmott, age 72

"An Irish Canon," age 72.

Mr. J. R. Marsh, age 70.

Mr. W. Crooke, age, 67.

Among this week's letters there are communications from three old-young riders of 75, 77, and 68 years of age, who enjoy all the pleasures of the side-car and solo mount.



Mr. R. Wolstenholme (age 77).

Mr. Jas. Scott (age 75) prefers a single gear clutchless 2½ h.p. Calcott, and Mr. R. Wolstenholme, of Blackburn, who is 77, also uses a solo machine.

The next reader in order of age is Mr. Richard Wolstenholme, who says:

"In the spring of 1916, after my seventy-fourth birthday, I bought a 2½ h.p. Douglas, and one Sunday morning I went out to learn to ride it. After one hour's lesson I rode it home, a distance of four miles. My longest ride in one day on the Douglas was 135 miles, which I did on just over a gallon of petrol.

"I am now the owner of a Bayliss and Thomas 4½ h.p. Excelsior, and was seventy-seven years of age on the 15th of March last, and I enjoy a good spin as well as a lad of twenty. I attribute

my good health and long life largely to the use I have made of the cycle as a means of going about the country and getting out into the fresh air.

"I may not be the oldest in age of any motor cyclist in the country, but if I am not, there will not be very many to heat me, and I should like to exchange photographs with them, if there are any older riders than I am."

A single-gear enthusiast, at the age of seventy-five, is Mr. Jas. Scott, of Insch, Aberdeenshire, who, in sending his photograph, gives a brief account of his experiences:

"In your issue of June 5th you invite photographs and experiences of young old motor cyclists. I herewith enclose photograph of self and my trusty 2½ h.p. Calcott fixed gear: no free engine. This machine has carried me a good few thousand miles without giving me any trouble, and no experiences other than pleasure.

"I have had a few falls on ice in winter, and a farmer's dog once ran in front of me and gave me a nasty fall, but the only damage was a bent footrest, so I mounted and rode off again.

"I am in my seventy-fifth year, and have been a motorist for the last eight years. I shall be very pleased to hear of a 'young-older' motorist."

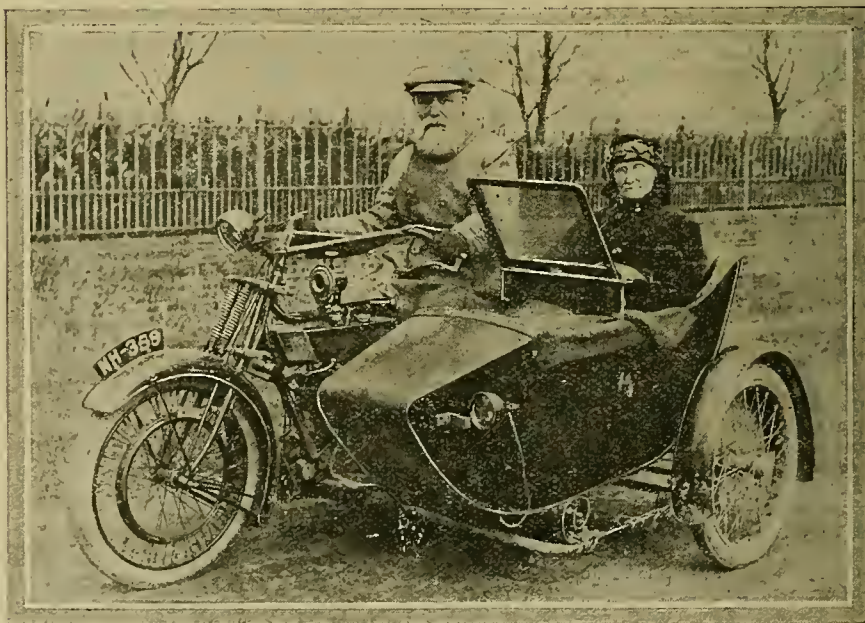
Mr. F. G. Hillyer, of Northampton, is another "young-old" motor cyclist, who began cycling in the days of the "bone-shaker," but he now prefers a 6 h.p. Enfield combination, upon which he undertakes quite long journeys. He was sixty-eight years of age in May last. "I commenced cycling at the age of sixteen," he writes, "my first machine being the old 'bone-shaker,' and I have been a keen cyclist for years, changing machines according to times. Forsaking the push bicycle in 1910 I became a motorist in

1914 on a Rex machine, changing for a Royal Enfield in 1916. With usual load of three adults I enjoy long rides. Sunday last, I rode to Tottenham, London, and reached there, after 3½ hours run, at 10 a.m.; left at 3 p.m. for Harrow,



Mr. J. Scott
(age 75).

arriving there at 4.30 p.m. The homeward journey commenced at 6 p.m., and I arrived at Northampton safely at 10 p.m. I am able to do all running repairs, and am ready to lend a hand to others on the road whose luck runs out. I had a bit of a spill in 1917 coming from Leicester, turned somersault, and kindly tipped occupant of Tansad back seat into the hedge, and myself somewhere on the road. After slight attention to all three of us, we resumed our seats and finished the nineteen miles for home. After a week's rest I was fit for riding, and have kept so ever since. I expect to go to London again on June 29th. As a long and interested reader of your paper I wish you every success in the future."



Mr. F. G. Hillyer (age 68).

QUESTIONS & REPLIES

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C.4, and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

Fitting a Magneto.

Q. I have a 5-6 h.p. Riley tricar, single-cylinder two-cycle engine with accumulator ignition. As the accumulators are so inconvenient, I should like to substitute a magneto. Could you kindly tell me what magnetos would suit my purpose? Would it require gearing up at all; if so, what proportion?—B.H.H.

The Riley tricar was never made with a two-stroke cycle engine. It is a four-stroke. You can fix any single-cylinder magneto which will require to be driven at half the engine speed.

Loss of Power.

Q. My engine is a $4\frac{1}{2}$ h.p. Precision running on benzole, and until recently it would take a sidecar and passenger up a good long hill on top gear. Now on opening the throttle the engine will not accelerate and loses power, and on a hill which I could take on top gear easily I now have to change into second gear about halfway up. The engine will take full air, and has developed this trouble suddenly.—J.A.

It is curious that the engine should have developed the trouble suddenly, and it seems as if it were due to a large amount of carbon deposit. The cylinder therefore should be removed and all carbon deposit scraped from the cylinder head and piston; the valves should be ground in, and new valve springs fitted if their tension appears to have been lost. Try changing your plug, and see if the jet is clear.

Running a Douglas.

Q. My machine is a 1914 $2\frac{3}{4}$ h.p. two-speed Douglas. (1.) Should I give the engine a charge of oil every five or every eight miles (drip feed)? (2.) When taking the machine out, does it require a charge of oil before starting? (3.) The sight feed glass fits the grooves on each side, but oil drips over the plug. How can I remedy this? (4.) How much oil does the gear box require? (5.) Apart from tools, what essential spares should I carry? (6.) How shall I drain the engine of dirty oil?—R.W.W.

(1.) You should set your drip feed so that it uses one pumpful of oil every half hour. (2.) No. (3.) If the oil leaks from the sight feed chamber, new washers are perhaps required. (4.) One pumpful of grease for every 300 miles. (5.) It would be as well to take a spare plug, inner tube, a chain, belt, and tyre repair outfit. (6.) There is a drain tap underneath the crank case.

Advice on an Old Stager.

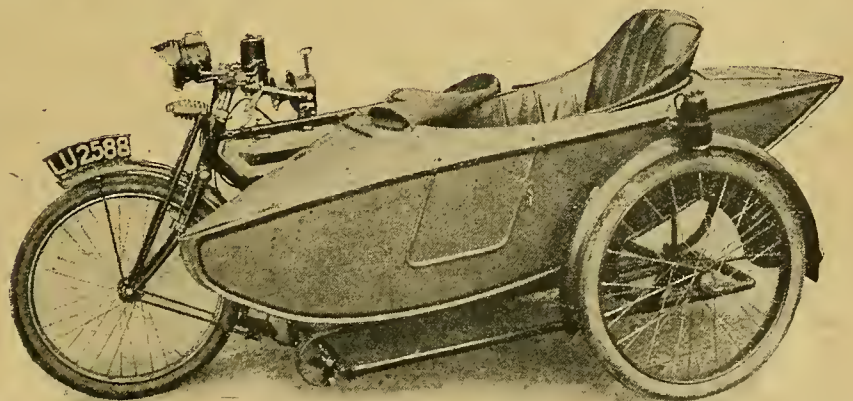
Q. I have an old Minerva motor cycle with battery and coil ignition, and the spark advance control on the side of the tank. (1.) Please tell me the reason why the pear-shaped plate which carries the make and break is linked up with a cam that can be used to lift the exhaust valve? The rod between the bell crank on the tank and the pear-shaped plate was missing when the motor bicycle was bought, and I am in doubt about the length I must make the new one. (2.) Can I get new valve caps for these old engines, and where? (3.) What are the electrical connections?—J.H.

(1.) The arrangement you refer to was introduced for the purpose of raising the exhaust valve before the time that the exhaust valve lifters were fitted with Bowden handle-bar control. The method of starting was to retard the spark fully, run alongside the machine, then mount, when the valve was dropped and the engine fired. There should be no difficulty in fitting a new rod. It is quite easy to measure the length of the rod required, and we are afraid that this is a matter in which we cannot help you without seeing the machine. (2.) It might be just possible to get a new valve for this engine from the Minerva Repairs Department, Chenies Street, London, W.C. (3.) The electrical connections are as follow: P on the coil to the positive terminal of accumulator; negative of accumulator to switch; B on coil to the sparking plug; C on coil to contact breaker; M on coil to frame.

Electric Conversion.

Q. I wish to run a head and tail lamp off the magneto. (1.) Where do I get my connections on the magneto? (2.) Which do you advise—to run lamps in parallel or in series? (3.) Will the current be sufficient to give an efficient head light at ordinary speeds? (4.) Give approximate voltage and ampère of the primary winding of magneto running at normal speed.—P.L.

Before adopting the scheme you suggest, we should advise you to consider the alternative plan of obtaining a small accumulator, say, twenty ampère hours capacity, and running your head and tail lamps from it in parallel. You would get a better light, which would be constant and quite independent of the engine speed and available when the machine is stationary. The only objection is having to get the accumulator charged up separately which is very easy in the case of such a small cell. If you determine to try the other plan, we recommend you to fit one of the transformer coils supplied by Messrs. F.R.S. Lamps, Ltd., Pershore Road, Birmingham. They are made specially for the purpose, and bring the voltage down to four, so that lamps may be wired from it in parallel. Although the primary winding of a magneto when running "open" will give, say, two ampères at four volts, the voltage in actual use is considerably higher on account of the self induction of the primary when the contact breaker opens, consequently this is not suitable for connecting directly to the lamps.



A sidecar of French design, produced by Mr. Geo. Levey, Paris, and marketed by Messrs. Robertsons, Great Portland Street, London.

Guarantee.

? I purchased a motor cycle through an advertisement in *The Motor Cycle*, and went to see the machine and the seller, and when we came to terms he gave me a receipt which guaranteed the machine "in perfect order when left here." On taking the engine down I find there are several things badly worn, such as the big end bushes, valve tappets and crank pin. A new set of valves will also be necessary. Can I legally claim any rebate from this man on the strength of his receipt, for, of course, this trouble could not arise in a fortnight?—F.G.

A guarantee to be binding must have been made before the actual purchase took place. In other words, it must be part of the inducement for the purchase. Probably this was so in your case; but if, after the machine was sold, the vendor voluntarily gave a receipt guaranteeing the machine to be in perfect order there would be difficulty. Was anything said about the condition of the motor cycle in the advertisement itself? It must also be borne in mind that it was only a second-hand machine, and the words "perfect order" would not imply that all parts of the machine are absolutely good, and you could not make a claim because certain parts are badly worn. Moreover, you appear to have kept the machine a fortnight before discovering any defects. Without further information, we can hardly recommend you to proceed for any rebate.

Charging Set.

? I have a 1 h.p. Auto-wheel engine which I propose to use to drive a small dynamo, provided I fit a cooling apparatus on it, to light my present residence, which is situated in the country. Will you kindly give me the following information: (1.) Is the 1 h.p. engine powerful enough to do the work? (2.) How many 25 c.p. lamps could I have lit at one time? (3.) What accumulators should I require for storage, and how long should I require to run dynamo daily to charge them? (4.) The best firm from whom to buy such a set and the approximate price?—A.J.D.B.

(1.) The 1 h.p. engine from an Auto-wheel will answer the purpose quite well provided you can make satisfactory arrangements for cooling. Probably you will do this with a fan. (2.) You do not give any idea of the size of your house or the total number of lights, but the 1 h.p. engine will give enough power for about ten lamps at once of 25 c.p., using metallic filament lamps of the ordinary type. This figure should be taken as a maximum, and will keep the engine working at its full power with consequent demand for efficient cooling. (3.) We should recommend you to adopt a twenty-five volt system, and for this you will require a dynamo with an output of thirty-five volts and about ten amperes, with fourteen accumulators. The length of running time will, of course, depend largely on the time of year, but, on the average, you will probably find two or three times a week sufficient, especially if you install accumulators of large capacity for the work. This is an important point. (4.) You will find the Crypto Engineering Co., 149, Bermondsey Street, S.E., a very good

firm to deal with in such a manner. They make a speciality of small sets like yours. We are unable to say anything about prices at the present time. By adopting twenty-five volts as your standard you would be able to make use of half-watt lamps, with a further reduction of current, and we should strongly recommend you to try them to secure the fullest economy.

Irregular Gas Generation.

? My head lamp and rear lamp are supplied with gas from one F.R.S. generator, and the light continually goes up and down. Sometimes it goes so low that the rear light goes out. I shall be much obliged if you can help me to discover the cause of the trouble.—E.A.C.

We should think that the water supply is irregular. Remove the needle valve, and see that the passage is quite clear by blowing through the top hole. Also see that the filtering material underneath the tank is not clogged and the small tube quite clear, and go over the distributing tubing to see that there is no water lying in it.

Lubrication.

? I have just read your reply to a correspondent in trouble with the plugs sooting up on his 4 h.p. Douglas. I have one of these machines, new this year, and am having the same trouble. So far as I know, the lubrication is taken out of the rider's hands, except in the case of the auxiliary feed to the front cylinder, and if you can tell me how to cut down the oil consumption, I shall be very much obliged. This machine consumes about four pints of oil in 100 miles, and the makers' instructions on the tank state that the sump must be filled every 100 miles. I have ridden my machine several hundreds of miles and have already had to remove the cylinders for the purpose of cleaning them out. I found the carbon deposit on the top of the pistons to be quite $\frac{1}{8}$ in. thick. After laying one of the cylinders on the bench for a few minutes, a small pool of oil collected on the bottom side. From what I can see of it, the pistons must be fairly bathed in oil. I am thinking of shortening the little dippers attached to the big ends. These dippers are about $\frac{1}{8}$ in. long, and the whole length dips into the oil. I thought of making them half this length. Shall I be causing any serious harm? There is a good description of the lubrication system in your handbook. This excessive oil consumption makes the machine expensive to run, and if you can help me, I shall be very grateful.—L.W.

There are two methods of reducing the oil supply: one is to remove the small screw at the bottom of the pump and take out the spring and ball which you find after removing the screw, or a better method would be to fit a longer screw with a locknut, by means of which you could alter the tension of the spring. We should advise you to send to Messrs. Douglas Motors, Ltd., 39, Newman Street, London, W.1, for their new booklet describing the 4 h.p. model. On no account interfere with the dippers.

EXPERIENCES WANTED.

"E.R.G.H." (Wimborne.)—Binks carburettor on $2\frac{1}{2}$ h.p. Douglas. Speed, acceleration, starting, m.p.g., and ease of fitting.

READERS' REPLIES.**Scott Timing and Lubrication.**

I notice in *The Motor Cycle* of June 5th, "W.C.S." is asking advice on these points, and that he cannot get his left-hand cylinder to fire. There is one thing he might verify, as I have had a very similar case to deal with and found it very puzzling till we hit upon the trouble, which we did quite by accident. The trouble was that the cranks had got out of time and were not spaced 180° apart. It would be well for "W.C.S." to take off both crank case covers and see that when one crank is on the top centre the other is on the bottom centre. I do not say this is the solution of the trouble, but I know it will cause the condition he complains of. The cure is to slacken the bolt which passes through the crank—it has a left-hand thread—and bring the two cranks opposite each other and tighten the bolt well; it will require a box spanner and is screwed up very tightly.—D. G. TAYLOR.

RECOMMENDED ROUTES.**KINGSTON TO BATH.—C.W.S.**

Slough, Maidenhead, Reading, Theale, Hungerford, Marlborough, Calne, Chippenham, Box, Bath.

BEAUFORT TO FISHGUARD.—J.W.C.

Beaufort, Tredegar, Merthyr Tydfil, Neath, Morriston, Pontardulais, Carmarthen, Newcastle Emlyn, Cardigan, Newport, Fishguard. Approximately 114 miles.

MANCHESTER TO CRICCIETH.—J.L.T.

Manchester, Altrincham, Northwich, Chester, Hawarden, Wrexham, Llangollen, Corwen, Bettws-y-Coed, Capel Curig, Beddgelert, Tremadoc, Criccieth.

LONDON TO THE WYE VALLEY VIA OXFORD.—D.E.J.

London, Brentford, Hounslow, Slough, Maidenhead, Henley, Nettlebed, Benson, Dorchester, Oxford, Witney, Northleach, Cheltenham, Gloucester, Newnham, Lydney, Chepstow, where you enter the Wye Valley.

HONITON TO HULL.—J.G.M.

Honiton, Ilminster, Ilchester, Sparkford, Bruton, Frome, Trowbridge, Melksham, Chippenham, Wootton Bassett, Swindon, Faringdon, Oxford, Baynards Green, Brackley, Towcester, Northampton, Kettering, Great Weldon, Stamford, Grantham, Lincoln, Brigg, New Holland, by ferry to Hull.

WANSTEAD TO BOURNEMOUTH.—A.E.E.

Wanstead, Lea Bridge Road, Dalston, Essex Road, Pentonville Road, Enston Road, Marylebone Road, Oxford and Cambridge Terrace, Bayswater Road, Shepherd's Bush Road, Hammersmith Broadway, Castelnau, Barnes, Roehampton, Kingston, Surbiton, Esher, Cobham, Guildford, Hog's Back, Farnham, Alton, Alresford, Winchester, Romsey, Cadnam, Ringwood, Christchurch, Bournemouth.

cases the articles ultimately find their way back to owners.

Patrols and Car Thieves.

The present epidemic of motor car thefts discloses additional evidence of the real utility of A.A. Patrols.

A member loses his car or motor cycle and telephones particulars immediately to the nearest A.A. Office. As soon as this information is received by the Association, a full description of the stolen vehicle is telephoned to the A.A. Branch Offices, and all the A.A. roadside sentry box telephones. The patrols in charge, in turn, pass the information to all other patrols in their districts

The hue and cry is raised!

When the car or cycle is seen, "necessary action" is taken to bring it to a standstill. If such action is unsuccessful, the patrols use the wires running from the A.A. roadside telephones, and other steps are taken to arrest the thief's progress.

Roadside Telephones.

A most valuable adjunct to the patrol service of the Automobile Association is the system of telephones installed by the roadside. These telephones are chiefly located at crossroads, sharp corners, and other danger points where motor cyclists can best be served by patrols on "fixed point duty."

The telephones can be used by members for all purposes, and are particularly useful to motor cyclists who desire to remain in touch with home and business during journeys. If a member's route is known, the number of his cycle can be 'phoned to selected sentry boxes. When the cycle passes it will be identified by means of the index mark, stopped by the patrol, and the member can communicate with his home or office.

Touring Facilities.

The Routes Department of the A.A. prepares routes and tours under the supervision of members of the staff who have personal and reliable knowledge of the districts suggested. This knowledge is augmented by road information obtained from members, patrols, surveyors, road-agents, and other correspondents.

The information given is thus complete and shows in a brief form:—

1. The roads best adapted to meet members' requirements.
2. The names of all towns and villages which are given on sign posts or are easily recognised on a motorist's map.
3. All turnings which are likely to be missed.
4. The distance between towns and the total mileage of the tour.
5. The chief places of interest along the route.

Information regarding hotels, garages, and agents is given in the A.A. Handbook (issued free to all members), so that a motor cyclist is never at a loss for a reliable hotel or garage.

Free Legal Defence.

The legal benefits offered by the A.A. to members include FREE LEGAL DEFENCE in any police court in the United Kingdom in respect of alleged offences under the Motor Car Act and Regulations. The benefit is open both to the member and to his paid driver, and the offences covered include—Driving Dangerously, Exceeding the Speed Limit, Obscured Numbers, Non-compliance with the Lighting Orders, and the many technical points raised under the Registration and Licensing Regulations, etc., etc.

FREE LEGAL ADVICE is also available to members on any matter connected with motor-

ing. This benefit includes such matters as Liability for Accidents on the Road, Claims for Damage in Transit, the Responsibilities of Garage Proprietors, Disputes over the Buying and Selling of Cars, Theft of Cars, etc., etc.

Other privileges enjoyed by members of the A.A. include Engineering Assistance, Special Insurance Facilities, "First Aid" machines, Foreign Touring Assistance, etc., etc.

The annual subscriptions, which run for twelve months from date of joining, are:—

Ordinary Member, £2 2s.	.. ..	(Badge fee, 5/-)
Light Car Member, £1 1s.	.. ..	(Badge fee, 4/-)
Motor Cycle or Cycle Car Member, 10/6	.. ..	(Badge fee, 3/-)

Complete information as to the objects of the Association and the many privileges it extends to its members are contained in a recently published booklet entitled "The Key to the Open Road," a copy of which is obtainable on request.

All correspondence should be addressed to the Secretary, A.A. & M.U., 21, Farnham House, Whitcomb St., London, W.C.2.



Thick black lines show roads patrolled. Circles denote Area Headquarters and Branch Offices. Squares indicate Appointed Agents, Repairers, and Hotels, "North, South, East, or West," A.A. Service is the Best."

MISCELLANEOUS ADVERTISEMENTS.

PRICES.

ADVERTISEMENTS in these columns—First 12 words or less 2/-, and 2d. for every additional word. Each paragraph is charged separately. Name and address must be counted. Series discounts, conditions, and special terms to regular trade advertisers will be quoted on application.

Postal Orders and Cheques sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd.**, and crossed **& Co.** Treasury Notes, being untraceable if lost in transit, should not be sent as remittances.

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.4), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge, which must include the words Box 000, c/o "The Motor Cycle." Only the number will appear in the advertisement. All replies should be addressed No. 000, c/o "Motor Cycle," 20, Tudor Street, E.C.4. Replies to Box Number advertisements containing remittances should be sent by registered post.

In the case of motor cycles offered for sale under a box number, as it is unusual for these to be sold without first being inspected by the intending purchaser, advertisers will facilitate business by embodying in their advertisements some mention of the district in which the car offered may be seen and tried.

DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pays carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged; when under £10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

MOTOR CYCLES FOR SALE.

A.B.C.

EARLIEST Deliveries of A.B.C.; book your order now.—Witham Bros., Newport, Wight. [1355]

A.B.C.—Caffyns, Ltd., Eastbourne, distributors for Sussex, are booking orders for earliest deliveries. [0015]

JONES' Garage, special agents for A.B.C., Broadway, Muswell Hill, N.10, and Woodside Parade, North Finchley. [2930]

CROW Bros., High St., Guildford, have contracted largely for the new A.B.C. Order now for earliest delivery. [5298]

LIVERPOOL and District Agents for A.B.C. Place orders now to secure early delivery.—Victor Horsman, Ltd., 9, Parr St., Liverpool. [0003]

A.B.C.—Sole agents for these famous machines—Orders booked now for early delivery.—Ohmndier, Reyre, and Williams, Sun St., Hitchin. [5996]



Sole London Agents for

A.J.S. and British Excelsiors.

Pillion Seats in stock.



The Tan-Sad Spring Seat, dish-shaped, easily fitted, No. 1 33/-
Extras.—Cushion and Grips, No. 8 5/-
Terry's Spring Pillion Seat, leather-covered. Price 45/-
Leather Racing Helmets 10/- and 11/6

Bluemels' Inflators:

15" 8/8
18" 7/-
(Post 3d.)

SPECIAL TOOL KITS.

Contains 2 adjustable wrenches, pliers, screwdriver, punch, file, tyre levers, belt-punch, set of tubular box spanners, and oil-can. Price (complete) 21/6
Post paid.

Cameo Windscreen 65/-
With valance 60/-
(Post free.)

CARBURETTORS:

B. & B. Standard, for 3½, 6, and 8 h.p. machines 72/-
B. & B. Lightweight 67/-
Amac Special, for Douglas machines .. 70/-
Handle-bars, Semi-T.T., 27in. wide, ½ or 1in. stem (carriage gd.) 16/-
Spring Links (Terry's), for machines up to 6-8 h.p. per pair 18/6
Cleaning Brushes, wire-bound, 6in. overall, handy size. Price (post 3d.) 1/-
Paste Solder. Repairs by anyone can be carried out on the road. Price (per tube (post 3d.) 2/6
Insulating Tape:
Per roll, large size 1/4
Ditto, medium size 10d.
(Post 2d.)
Tail Lamps (post 3d.) 5/6

THE DELUGE TRIPLE PROOF COAT, D.B.
Special protection for back and shoulders, seatless overalls, shaped to fit legs.

Finest value offered Price 60/-
(Post paid.)

H. TAYLOR & CO., LTD.

Showrooms: 21a, STORE STREET, W.C.1.
Wholesale: 38, ALFRED PLACE, W.C.1.
Garage: Tottenham Court Road. Phone—Museum, 1240.
Telegrams—"Dynametro, Westcent, London."

MOTOR CYCLES FOR SALE.

A.B.C.

1914 3-speed A.B.C. T.T. model, and C.B. sidecar, as new, very fast; deeds as louder than words; £90.—H. Stubbs, Askern, Doncaster. [X4164]

A.B.C. Distributors for North Derbyshire, book your orders now to ensure early delivery.—W. R. Sanders and Co., Ltd., Sanders' Garage, Buxton. [X3544]

A.B.C.—Distributors for Scotland. Book your order now to ensure reasonable date for delivery.—Edinburgh Pioneer Motors, Ltd.; 50, Grindlay St., Edinburgh. [X8301]

FANCOURT'S Garage, Stamford, for A.B.C.'s; sole distributing agent for Sale of Peterboro' and County of Rutland; particulars and illustrations on request. [X9724]

WE Are Now Booking Orders for earliest deliveries of A.B.C. motor cycles. Secure an early delivery by placing your order with us now.—Danwells' Garage, Wigan. Tel.: 328. [X3219]

A.B.C.—Book early and prevent disappointment. Specification and full particulars will be sent on application.—The Spalding Motor Co., Ltd., Spalding, distributing agents for Lincolnshire. [X6969]

DAN BRADBURY, 224, London Rd., Sheffield, sole A.B.C. distributing agent for Sheffield and district, will give you earliest possible delivery of the new A.B.C. motor cycles and light cars. [7270]

Abingdon.

ABINGDON King Dick, 3½ h.p., 1913, 2½in. tyres, mechanical horn; 34 gns.—S. Egton Mews, Princess Hill, N.W. [4625]

1915 4½ h.p. Abingdon K.D. Combination, T.T., new piston and new Stumey-Archer 3-speed fitted, guaranteed perfect, as new, torpedo sidecar, lamps, horn; £72.—Hillcot, Biggleswade. [4123]

ABINGDON King Dick, 1914, 6 h.p. twin, Armstrong 3-speed and clutch, Bosch, splendid condition, with wicker sidecar, good chassis; £60, bargain.—Hucker, Hillsboro', Accock's Green. [X4387]

Aero.

AERO Super Single, 3½ h.p., overhead valves, single gear, real record-breaking 1920 model, built regardless of expense, with every detail studied; £85.—Specification and photos, 45, St. Andrew's Rd., Southsea. [4052]

A.J.S.

JACK HEALY, Cork.—Official A.J.S. agent.—Garage and works, Drinan St. [X8336]

CROW Bros., High St., Guildford, A.J.S. agents since 1912.—Deliveries have begun. [4083]

A.J.S. Combination, late 1918, as new, spare wheel; £175.—Hawell, 10, Victoria Rd., Swindon. [X3874]

A.J.S. Combination, 6 h.p., 3-speed, kick starter, splendid condition; £100.—Varney, 15, High St., Godalming. [4350]

A.J.S., 2½ h.p., 2-speed, h.b. clutch, B. and B. carburettor, plating as new; ride away £245, or offer.—Ivy Cottage, New Balderton, Newark. [X4157]

A.J.S.—Exeter Motor Cycle and Light Car Co., Ltd., Bath Rd., Exeter, and 28, Tavistock Rd., Plymouth. Sole agents. Now booking for earliest deliveries. [0007]

A.J.S. Combination, 1916, Lucas lamps, horn, tools, speedometer; any trial 4 up; £135; lower power part payment.—231, Coventry Rd., Red Hill, Yardley, Birmingham. [X4394]

A.J.S. 6 h.p. Combination, late 1914, 3-speed, kick start, lamps, tools, speedometer, spares, splendid condition; £120.—Boymann, 27, High St., West Norwood, S.E.27. [X4312]

A.J.S. 6 h.p. and C.B. Sidecar, just been overhauled, splendid condition, lamps, horn, tyres good; 100 gns., or exchange small car; cash either way.—20, Fife Rd., Kingston, London. [4614]

1919 A.J.S. Peace Model 6 h.p. Combination, spare wheel, wind screen, apron, hood, side curtains, delivered mid-May, perfect; £185. After 6.—64, Gladsmuir Rd., Highgate, N.19. [X4305]

A.J.S., 2½ h.p., 3 speeds, clutch, kick starter, Lucas lamps, horn, etc., perfect condition, purchased Sept., 1916; £65 nett; Southport district.—Box L2,228, c/o The Motor Cycle. [4731]

A.J.S. Combination, 6 h.p., spare wheel, 3 Lucas lamps, Cowey speedometer, Lucas H.B. mirror, and horn, full set spares, perfect condition; £175.—Upward and Rich, Newport, I.W. [X4207]

A.J.S. 6 h.p. Combination, late 1917, war model, spare wheel, wind screen, storm apron, horn, 3 lamps, first-class condition, had very little wear; £150; trial—10, South Riley St., Burslem, Staffs. [X4320]

A.J.S., 5-6 h.p., 1914 model, sidecar, screen, pillion seat, speedometer, 3 lamps, all accessories, condition perfect; no dealers.—A.C.S., 7, Duke's Av., Chiswick, W.4. Phone: Chiswick 206. [X4105]

MOTOR CYCLES FOR SALE.

Chater-Lea.

1916 Chater-Lea Combination, been stored, electric lamp, 3-speed, etc.; £125, or nearest.—672, Commercial Rd., E.14. [4707]

CHATER-LEA 8hp. Coachbuilt Combination, 3-speed, clutch, Bosch mag., lamps, speedometer, etc., ready to ride away; £90, or exchange less power; no dealers.—Wray, 1, Yale Rd., Tunbridge Wells. [4165]

Chater-Lea-Jap.

J.A.P.-CHATER-LEA, 2 speeds, F.E. Bosch, B. and B.; £50.—Williams, Brightview, Hadley Rd., New Barnet. [4380]

CHATER-LEA-J.A.P. 4½h.p. Combination, coach-built sidcar, 3-speed, clutch, Bosch, B. and B., accessories, just overhauled; £65. Any time Thursday-Friday afternoon.—Hillary, 2, Dupree Rd., Charlton. [4425]

Chater-Lea-Minerva.

4h.p. Chater-Lea-Minerva, C.A.V. mag., B. and B. carburettor, m.o.v.'s, semi-T.T. bars, in running order; sacrifice £20.—F. Bomford, Broughton, Pershore. [X4046]

Chater-M.M.C.

CHATER-M.M.C., 3½-4h.p., mag., B. and B., semi-T.T. Druids, good condition, mechanically sound, cane sidcar; trial; £22, or separate.—15, Rectory Rd., Grays. [4347]

Clement.

CLEMENT-GERRARD, all complete, wants slight repair; what offers?—H. Wright, Yewtree, Diggle, near Oldham. [X4248]

Clyno.

CLYNO Combination, 6h.p., kick start, splendid machine; £75.—Sapsworth, 193, High St., Tonbridge. [X4173]

CROW Bros., High St., Guildford, West Surrey agents for the new Clyno.—Order now for early delivery. [4084]

6h.p. Clyno Combination, detachable wheels and spare, 3-speed, good condition; £95.—Harper, Craven Arms. [X4047]

CLYNO 2½h.p. 2-stroke, 2-speed and clutch, topping condition, snip; £45.—Avon Cycle Co., 85, Church Rd., Willesden, N.W. [4572]

CLYNO 1915 2½h.p. 2-stroke, 2-speed, hand clutch, perfect condition, good appearance; 44 gns.—56, Manor Lane, Lee, S.E. [4638]

CLYNO Combination, 5-6h.p., 2-speed, K.S., speedometer, Bosch, Amac, new back tyre; 65 gns.—Rice, 149, Bowes Rd., Palmer's Green, N.13. [4582]

CLYNO coachbuilt Combination, 1915, 3-speeds, countershaft, kick-start, chain drive, all accessories, as new; £80.—1, Bell's Garden Rd., Peckham. [4655]

1916 Clyno, 5-6h.p., wicker sidcar, 2 speeds, lamps, tools, spare cover, new inner tube, and slightly damaged cover on sidcar wheel, just overhauled; £95.—Wynnstay, High St., Berkhamsted. [X4250]

CLYNO Combination, splendid condition, 6h.p., 3-speed, K.S., lamps, tools, and spare wheel; £130; after 6.30 p.m.—Jepson, 139, Fellow's Rd., South Hampstead, N.W.3. [4198]

CLYNO Coachbuilt Combination (late model), 6h.p., 3-speed countershaft, clutch, interchangeable wheels, spare wheel, lamps, speedometer, electric horn, luxurious outfit; £135.—R., 5, Victoria Av., Surbiton. [4686]

Connaught.

CONNAUGHT, 2½h.p., 2-stroke, in new condition; a real bargain, £55.—96, Ashbourne Rd., Mitcham. [4539]

CONNAUGHT 2½h.p., 1915, perfect running order; no dealers; £32.—60, Apsley Rd., South Norwood, S.E. [X4293]

CONNAUGHT, 2½h.p., 3 speeds, K. starter, drip feed; photo; beautiful condition; £46, or exchange geared 3½h.p.—20, Frankfort St., Birmingham. [4267]

Coulson.

SOUTH Lancashire, North Cheshire, and Isle of Man buyers order now from Official Coulson B. dealers, J. Blake and Co., Liverpool-Manchester. [3659]

COULSON B.—South Lancashire, North Cheshire, and Isle of Man; residents enquire.—J. Blake and Co., Official Dealers, Liverpool and Manchester. [X4467]

Coventry Eagle.

1917 Coventry Eagle, Villiers 2½h.p. 2-stroke engine, 2-speed gear, excellent condition; £50.—H. S. Hartley, 11, Lyndhurst Rd., Highams Park, Chingford. [4247]

Dayton.

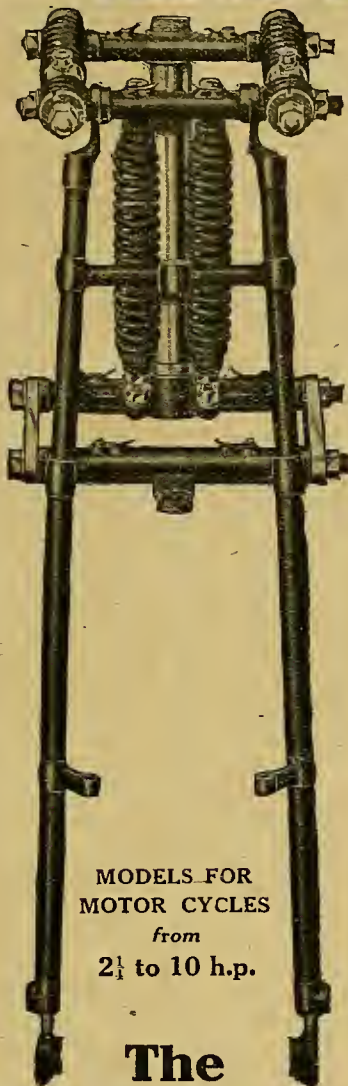
DAYTON 2-stroke, good order, little used, with horn; £22.—Guy, Queen's Rd., Thame, Oxon. [4199]

Diamond.

1916 2½h.p. Diamond, 2-speed, stored 18 months, lamps, horn, and accessories; £45.—109, St. Michael's Rd., Aldershot. [X4165]

Dot.

LATE 1914 4½h.p. Single Dot-Precision, 3-speed, clutch, new belt, original tyres, stored 2 years, perfect; £65.—Fullerton, Ranelly, Omagh, Tyrone. [4326]

MODELS FOR
MOTOR CYCLES

from
2½ to 10 h.p.

The BRAMPTON

Bi-Flex

Spring Fork

—which, by reason of its vibration and shock-absorbing efficiency was, specified by the War Office for fitment to the Vickers-Clyno Motor Cycle Machine Gun Combinations. Motor Cycle Ambulance Combinations were also fitted with the Brampton Bi-Flex Spring Fork for the same reason, as well as large consignments of motor cycles which were shipped to the various theatres of the war for solo work. To ensure the maximum of comfort a wheel and to prolong the life of your motor cycle, you should specify and insist upon the fitment of the Brampton Bi-Flex Spring Fork.

Sole Makers—

BRAMPTON BROS., Ltd.
OLIVER ST., BIRMINGHAM.

MOTOR CYCLES FOR SALE.

Douglas.

DOUGLAS, king of horizontals.—Gourlay, Agent, Fallowfield. [2571]

DOUGLAS, 2½h.p., brand new.—8a, Eden St., Hampstead Rd., N.W. [4122]

DOUGLAS 2½h.p., new in crate, bargain; 78 gns.—31, King's Av., Malden, S.W. [4263]

2½h.p. Douglas, new W.D. model in crate; 80 gns.—31, King's Av., Malden, S.W. [4055]

2½h.p. Douglas, W.D. Model, brand new; £74.—16, Grove Parade, East Finchley. [4593]

DOUGLAS 2½h.p., 1914, single speed, needs slight repair; what offers?—40, Darroly Rd., Gravesend. [4407]

DOUGLAS, 2½h.p., overhauled and enamelled, lamps, etc.; trial; £28/10.—57, Crabtree Lane, Fulham. [4540]

DOUGLAS, 1915, 2-speed, new tyres, guaranteed perfect; no offers; £58.—Crowe Garage, Chingford. [4681]

DOUGLAS 2½h.p., new, just uncrated; for quick sale 65 gns.—6, Clarendon Place, Notting Hill, W.11. [X4291]

DOUGLAS 1913 2½h.p., single speed, new tyres, in good running order; £40.—10, Rothes Rd., Barking. [4580]

DOUGLAS 2½h.p., 2-speed, T.T. model, adjustable pulley, good condition.—90, Stratford Rd., Wolverton. [X4343]

DOUGLAS T.T. 2½h.p., 1914 or later; no rubbish wanted.—D. F. Heybourn, 17, East Rd., Maidenhead. [4597]

BRAND New Douglas's in stock, not scratched; list price only.—J. Smith and Co., 16, Hampstead Rd., N.W.1. [3973]

DOUGLAS, 2½h.p., 1913, 2-speed, good condition; £53.—Humphrys, Hardwick, Duppas Hill Rd., Croydon. [4364]

DOUGLAS.—Best deliveries; 4h.p. combination, £110; War Office 2½h.p., £65.—Moffat, Yeovil. Phone: 50. [1103]

DOUGLAS 2½h.p. Twin, mag., runs splendidly; 28 gns.—Wandsworth Motor Exchange, Ebner St., Wandsworth. [4493]

2½h.p. Douglas, 2-speed, clutch, and kick-starter, perfect condition; £50.—Lawn, Prospect House, Long St., Thirsk. [4108]

DOUGLAS 2½h.p., 1914, splendid condition, new tyres, stored 3½ years; £55.—Adney, Belle Vue Rd., Chalfont. [X4234]

2½h.p. Douglas, unused, built under Government inspection; 74 gns.—M.C., Rivington House, Woodford Green. [4331]

DOUGLAS 1914, 2-speed, Palmer cord, Klaxon horn, perfect condition; 48 gns.—Dowdall, 185, Fentiman Rd., S.W. [4131]

DOUGLAS 2½h.p., W.D. model, not been used.—Seen at 3a, Devonshire Row Mews, Devonshire St. off Gt. Portland St., W. [4164]

DOUGLAS, 2½h.p., 2-speed, free engine, good running order, lamps and accessories; £58.—171, High St., Chatham, Kent. [4509]

DOUGLAS, 2½h.p., W.D., F.E., 2-speed, lamps, etc.; exchange for combination or sell.—9, Bello Lane, Chiswick, W.4. [4082]

1915 2½h.p. Douglas, 3-speed, lamp, horn, spare belt, chain, etc.; £65. After 6.—Douglas, 305, Green Lanes, N.4. [4652]

DOUGLAS 2½h.p., 2-speed, delivered 1914, stored 2 years, horn, clutch, new tyres; £50.—Garaged 20, Pembroke Rd., W.11. [X4297]

DOUGLAS 2½h.p., 2-speed, excellent condition; any trial; £55. Skinner, Millwrights' Arms, Walton Rd., Aylesbury, Bucks. [4308]

DOUGLAS, 2½h.p., W.D. model, brand new, still in crate; £76, or offer; seen any time.—O.S., 14, Swaton Rd., Bow, E.3. [4514]

DOUGLAS 2½h.p., recently overhauled, perfect throughout, any trial; £30.—53, Russell Rd., St. Anne Rd., Tottenham. [4640]

DOUGLAS 4h.p. Combination, new, ready to ride away; best offer over £140.—Austin's Garage, Hodderdon, Herts. Tel.: 45. [4470]

DOUGLAS 1919 W.D. Model, delivered April, Engine 39770, C.A.V. mag., perfect condition; £80.—92, Station Rd., Hadden. [4283]

DOUGLAS 2½h.p. W.D. Model, all black, new, not ridden 30 miles; 75 gns.; after 6 o'clock.—28, Spencer Av., Bowes Park, N.22. [4474]

DOUGLAS, 2 speeds, clutch, lamp, horn, Bosch, new tyres, excellent condition; £45.—Harford, 120, Sutherland Rd., W. Croydon. [4296]

DOUGLAS, 2½h.p., 3-speed, Colonial T.T., all accessories, spares, and tools; after 6; 68 gns.—25, Colville Rd., Leytonstone. [4439]

DOUGLAS 2½h.p., 2-speed, excellent condition, £42; also 2½h.p. Douglas, ride away, £39.—9, Albert Rd., Bromley Common, Kent. [4621]

MOTOR CYCLES FOR SALE.

Douglas.

1913 2½h.p. Douglas, footboards, good running order recently overhauled; any trial; £25.—R.S., 27, St. Helen's St., Ipswich. [X4255]

GIBB, The Douglas Expert, Gloucester (Phone: 852), regrets to inform his numerous clients he cannot accept orders for early deliveries. [4749]

DOUGLAS 2½h.p., new, delivery from stock; bargains at 80 gns.—W. H. Grimes and Co., 18a, Bruton Place, New Bond St., W. [4604]

DOUGLAS 2½h.p., 1915, stored 2 years, good condition, complete accessories, spares; £55; after 6.—39, Kingston Lane, Teddington. [4595]

DOUGLAS 1911 2½h.p., T.T. bars, lamps, etc., slight repairs needed, good tyres; £15.—Jellicoe, -16, Adamson Rd., Swiss Cottage, N.W.3. [4136]

1917 Douglas, 2½h.p., 2-speed, W.D. model, splendid running order, new tyres, £52; 1915 ditto, £44.—Box L2,230 c/o The Motor Cycle. [4733]

DOUGLAS 4h.p. and Swan Sidecar, late model, perfect order, trial; seen by appointment only; £80; no offers.—Fond, 13, Milton Rd., Bow, E.3. [4616]

DOUGLAS, 4h.p., 1915, 2-speed, F.E., kick starter, £70; Swan underslung sidecar to match, £20; any trial.—1, Henrietta St., Spalding, Lincs. [X4229]

DOUGLAS War Model 4h.p. Combination, in running order, but needs few parts and overhaul; £87/10.—Maudes', 100, Gt. Portland St., W.I. [4157]

2½h.p. Douglas W.D. Model, brand new, just taken 4 from crate, ready to take away; what offers?—Write W. Sparrow, Ltd., Osborne Garage, Yeovil. [X4416]

DOUGLAS 1916 T.T. 2½h.p., thoroughly overhauled, machine in fine condition; £65.—Smith's, 10-16, Havestock Hill (opposite Chalk Farm Tube Station). [4672]

DOUGLAS 2½h.p., 1913-14, 2-speed, condition excellent, engine thoroughly overhauled, as new, 1 new tyre; £60.—18, Chesilton Rd., Fulham, S.W.6. [4461]

1914 Douglas, 2½h.p., 2-speed, footboards, lamps, etc., overhauled, tyres very good, splendid order and appearance; £52/10.—Martin, 8, Grenville St., W.C. [4527]

4h.p. Douglas Combination and accessories, new this year, condition absolutely perfect, privately owned; £120; any trial.—Stedman, Sugden Nurseries, Worthing. [4345]

4h.p. Douglas Combination, 1915, excellent condition; £85, or highest offer, or exchange with cash for latest model.—Harding, 1, Vicarage Place, Shorne, near Gravesend. [X4298]

DOUGLAS 2½h.p. single-speed, 1911, excellent condition, will climb all main road Devon hills, tyres good, spare cover; 28 gns.—Marriott, Haines Hill, Taunton, Somerset. [X4287]

DOUGLAS, 1914, 2½h.p., Bosch, Amac, long exhaust, compound spring saddle, Miller lamp, stored 3 years, perfect; 53 gns.—England, 55, Park Hill, Carshalton. [4560]

1916 Douglas Combination, beautiful condition, 3-speed, electric light, mechanical horn, tyres nearly new; £110; seen any time.—1, Gt. Titchfield St., Oxford Circus, W.1. [4112]

DOUGLAS Combination, 1915, 4h.p., coachbuilt, electric lighting, new tyres, mechanically perfect, appearance as new; 112 gns.—179b, The Grove, Denmark Hill. Phone: Brixton 698. [4510]

DOUGLAS, 1913, stored during war, splendid running order, take two anywhere, Bosch, Miller, spare chain, belt, and sundries; £45 cash.—Stone, Jan., Hill Grove Crescent, Kidderminster. [X4218]

DOUGLAS 1915 2½h.p., 3-speed, complete, lamps, generator, Klaxon, good tyres, bike done about 3,800 miles; owner returning N.Z.; seen Salisbury district; £50.—Box 4,152, c/o The Motor Cycle. [X4150]

IT Appears Ridiculous to Advertise when you have no stock, but we are giving deliveries to the early birds. Place your order at once if you want delivery.—Eli Clark, Douglas Agent, 196, Cheltenham Rd., Bristol. [0966]

DOUGLAS 2½h.p. W.D., delivered new February, 1919, condition perfect, just done 1,000 miles, lamps, Klaxon, all tools, chain case, spares; £74 cash; getting larger machine.—Nisbet, Easington Castle Rd., Walton-on-Thames (station). [4244]

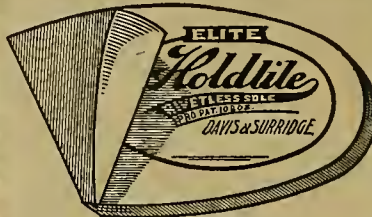
DOUGLAS 1914, 2½h.p., just overhauled and de-carbonised, in exceedingly good condition, take any hill on top, tyres nearly new, long exhaust, semi-T.T., Bosch, B. and B.; valued £65, what offers?—S., 129, Belsize Crescent, N.W.3. [4089]

4h.p. Douglas Combination, 1916, 3-speed, lamps, mechanical horn, speedometer, heavy Dunlops practically unscratched, engine in splendid order and everything mechanically sound; not army scrap; 95 gns.—6, Dinsmore Rd., Balham, S.W.12. [4465]

4h.p. Douglas crankshaft, £2; ditto chain, 10/6; ditto rear brake, 10/6; D.A. cylinder, 55/-; 26½ butt-ended Dunlop tube, 12/6; Renold chain, 3½x5-16, 9/6; Douglas and Bradbury rims, 10/- pair; all above new.—Hocken, Lizzen Polperro. [4327]

HOME BOOT REPAIRING

"Elite Holdite Rivetless Soles."



Soles STUCK ON.—

We are now placing on the market an entirely new and Patented Rubber Sole. These soles are specially prepared with an adhesive surface, and fixed with Elite Holdite Sol-fix solution. We guarantee them to hold as firm as rivets or sewing. This process of fixing is exactly the same of that of repairing a punctured Motor or Motor Cycle tube. One of the many great advantages of our process is that the Boots or Shoes when fitted with our soles become absolutely waterproof. Full instructions given with each pair of soles.

PRICES:

Size.	Gents'.	Per Pair.
10-11	3/6	
8-9	3/3	
6-7	3/-	

Size.	Ladies'.	Per Pair.
6-7	2/8	
4-5	2/4	
2-3	2/-	

Size.	Boys' and Youths'.	Per Pair.
4-5	3/-	
2-3	2/10	
1-13	2/8	

Size.	Childs' (Light).	Per Pair.
1-13	1/6	
11-12	1/3	
9-10	1/-	

Sol-fix Solution:

In Tins, 8d., 1/3, 2/6, and 4/6. An 8d. tin is sufficient for 2 pairs of soles. Solution Brush, 4d.

Please remit 6d. to cover cost of postage. Any excess will be refunded.

**ELITE
RUBBER
Co., Ltd. (Dept. A),**
264-266, Vauxhall Bridge Road
VICTORIA, S.W.1.

MOTOR CYCLES FOR SALE.

Douglas.

2½h.p. Douglas.—We are not at present accepting further orders until such a time as we can obtain a sufficient number of 2½h.p. Douglas machines. We shall still be pleased to send illustrations and information likely to help our many customers.—Robinson's (below).

4h.p. Douglas Combination.—We are not at present accepting further orders until such a time as we can obtain a sufficient number of these outfits. We shall still be pleased to send illustrations and information likely to help our many customers.—Robinson's Garage, Green St., Cambridge. T.A.; Bicycles. Tel.: 388. [4724]

DOUGLAS, late 1915, 2½h.p., 3-speed T.T., special engine, Aerolite pistons, long extension exhaust, mechanical horn, large Lucas lamp and generator, electric tail lamp, tyres and belt good, tools, pump, whole machine in new condition, perfect all through, little used during war; trial; £70.—E. Southam, Peterstow, Ross, Herefordshire. [X4390]

1915 Douglas 2½h.p., 3-speed model, privately owned, bought new by owner, mileage guaranteed under 1,400, carefully stored during war, absolutely as new in appearance and mechanical condition, T.T. and raised handle-bars, rubber-covered footboards Binks and Douglas carburettors, both perfect, new XL All saddle, extra large heavy tyre back wheel, both tyres unscratched, Lucas head lamp and generator mileage recorder, mechanical horn, spare belt, chain and new valve complete, ready drive away; accept £67 seen any time.—Richmond, 31, Wetherby Mansions Earl's Court Sq., Earl's Court, S.W.5. [4677]

Enfield.

2½h.p. 1912 Enfield, single speed, running order; £25 —12, Upleas Marshes, Faversham. [4401]

ENFIELD, 2½h.p., 2-speed, in splendid order; £35 —Bellwood, Victoria Rd., Scarborough. [4325]

2½h.p. Enfield, splendid condition, running order; £27 —3, St. Margaret's Rd., Brockley. [4305]

ENFIELD 1917 6h.p. Combination, like new; offer. —29, St. Leonard's St., Bromley-by-Bow. [4519]

2½h.p. Enfield, 2-speed, lamps, new chain, good condition; £35.—Coles, West Knoyle, Mere, Wilts. [X4149]

ENFIELD Twin Lightweight, 2-speed gear; 38 gns.—Geo. Smith, Motor Cycle Depot, Clapham Junction. [4011]

ENFIELD 2½h.p., 1911, Bosch, B. and B., good condition; £25; after 7.—187, Algernon Rd., Lewisham. [4402]

ENFIELD 6h.p. Combination, 1918, first-class condition; £145.—73, Victoria Rd., Stroud Green, N.4. [4678]

1919 Enfield Combination, under 700 mileage; owner bought car; what offers?—Box 4,172, c/o The Motor Cycle. [X4400]

JONES' Garage, special agents for Enfields, Broadway, Muswell Hill, N.10, and Woodside Parade, North Finchley. [2920]

ENFIELD, 2½h.p., 2-speed, free engine, Bosch, B. and B., good tyres, and lamp; £37.—Warner, 86, Church Rd., Acton. [4551]

£28.—2½h.p. Enfield, countershaft, spring footboards, chains, tyres in good condition, climb anything.—Box 4,154, c/o The Motor Cycle. [X4142]

1916 Enfield 6h.p. Combination, lamps, speedometer, etc., little used, perfect condition; any trial; £130.—Empson, Cockayne Hatley, Pottton, Beds. [4491]

1916 3h.p. Enfield, Middleton sidecar, condition perfect, done 1,000, speedometer, 3 lamps, Klaxon; £78.—Write, Stock, 10, Munster Rd., Teddington. [4370]

ENFIELD 1916 3h.p. Twin, 2-speed, complete with lamps, horn, and speedometer; first cheque £65.—Macdonald and Son, 6, St. Mary's Gate, Manchester. [X4172]

ENFIELD Combination, 6h.p., 1916, lamps, speedometer, etc., perfect condition; £135; seen after 6 p.m.—43, St. George's Rd., Kingston Hill, Surrey. [X4411]

ENFIELD Combination, 1916, 3 Lucas lamps, Cameo, wind screen, storm apron, grand outfit, completely overhauled; £145, no offers.—125, High St., Woolwich. [X3861]

ENFIELD Combination, 1914, splendid condition, coachbuilt sidecar, new tyres, Bosch mag.; £110.—Apply, 32, Elsie Rd., East Dulwich, London, S.E. (After 6 p.m.) [X4322]

ROYAL Enfield 1916 3h.p. Twin, 2-speed, clutch, kick start, 2 Lucas lamps, very good condition; Leicester; ride away; best offer over £55.—Box 4,173, c/o The Motor Cycle. [X4382]

LATE 1916 Enfield Combination 6h.p., hoed, screen, speedometer, accessories, beautiful condition; bargain, 125 gns., nearest.—Gordon, Confectioner, 3, Wastdale Rd., Forest Hill, London. [4675]

ENFIELD 1919 8h.p. Combination, delivered Easter, Lucas lamps and horn, all spares including tube, condition absolutely as new; no offers under £160.—Gash, 51, Tennyson Av., Bridlington. [4070]

ENFIELD 6h.p. Combination, 1916, stored 2 years, first-class condition; any trial; lamps, generators, speedometer, all tools, spare cover and inner tube, new; £140.—30, Kelvin Av., Bowes Park, N.22. [X4303]

MOTOR CYCLES FOR SALE.

Ivy.

IVY 2½ h.p. 2-stroke, new May, 1919, footboards and horn, only done 50 miles; £47/10.—Macguire, 220, New Cross Rd., S.E. [4180]

T.T. Ivy-Jap, 1915, 6 h.p., 3-speed countershaft, new tyres, perfect condition; £80.—J. E. Delph, 36, Market Hill, Cambridge. [X4347]

IVY 2½ h.p., 2-stroke, Albion 2-speed, Senspray, drip lubrication, good Dunlop tyres and belt, climb sun-rising easily; £33.—Avoncarrow, Vincent Av., Stratford-on-Avon. [X4108]

BROOKLANDS Special Ivy. Having to abandon further competition work I offer what presents an unparalleled opportunity for sporting riders. My 1914 2½ h.p. Ivy-Green-Precision is for sale. The machine, which was built specially for me, is fitted with a truly wonderful little engine. I could have sold it favourably many times during the war, but saw little use in disposing of a little friend whom I could, under no circumstances, replace. I guarantee the machine capable of lapping Brooklands at 60 miles per hour average—in fact, on Brooklands, I consider the machine can hold its own with any other 2½ h.p. in England, bar one. Actual mileage covered does not exceed 100, and condition throughout coincides with that amount of careful use. I offer the machine complete, with new tyres, and belt, at £75.—J. W. Tollady (late B.M.C.R.C.), The Layton Garages, Bicester. Phone: 35. [X4326]

James.

JAMES—Sole agents for Hertfordshire. 1919 machines in stock—Chandler, Reyre and Williams Sun St., Hitchin. [0997]

JAMES, 4½ h.p., fixed engine, 1913 T.T. model, good condition, real flyer, take two anywhere, ride away; £38.—Ovens, Brook St., Kidderminster. [X4051]

JAMES 4½ h.p. Combination, 3-speed, 1914, just overhauled, Lucas horn and lamps, Watford speedometer, Paragon sidecar, windscreen; £100.—Quarterman, 116, Wellmeadow Rd., Hither Green. [4723]

J.A.P.

4 h.p. Jap, Bosch, Grado, cane sidecar, screen; £40.—Downes, 69, Knapps Rd., Bow, E. [4255]

SPECIAL Racing 8-40 h.p. Overhead Valve 1916 J.A.P. 7in. adjustable pulley, in perfect condition, head and rear lamps, mechanical horn; £75.—Linnell, Wilby House, Wellingborough. [X4102]

J.A.P. Twin 6-7 h.p. Combination, nice sidecar, under-slung chassis, machine mechanically perfect, recently overhauled and renovated, tyres good, lamp, etc.; North London; price £85.—Box L2,200, c/o The Motor Cycle. [4316]

J.E.S.

J.E.S. 1 h.p. Auxiliary Motor Attachment, complete, brand new; 18 gns.—Ginger, Motors, Babbury. [X4360]

J.E.S. Auxiliary Lightweight Motor Cycle; any trial; excellent condition; £20.—Long, 13, Kilmarnock Rd., Hammersmith, W.6. [4427]

LEA-FRANCIS 3-speed Model de Luxe, with J.E.S. auxiliary set; photo sent with particulars; £25.—Hydegate, Uley, Dursley. [X4153]

J.E.S. Engine Set, with tank and magneto, ready to fit to wheel, needs slight attention; £6.—Bewers, 10, Hazeldene Rd., Haywards Heath, Sussex. [4166]

LANCASHIRE and Cheshire buyers order now from official dealers in J.E.S. motor cycle and attachment sets. J. Blake and Co., Liverpool-Manchester. [3660]

J.E.S. Motor Cycle and Attachment Sets.—Lancashire and Cheshire; residents order now from J. Blake and Co., Official Dealers, Liverpool and Manchester. [X4468]

Lea-Francis.

LEA-FRANCIS, 1919 (May), 4 h.p. J.A.P. twin, 2-speed, Lucas lamp, horn (black), electric tail, Brooks saddle, Palmer 2½ in. tyres, done 400; this machine is perfect and unscratched, £125; with special Montgomery sidecar (unused), painted and upholstered to match, £145.—Box 4,167, c/o The Motor Cycle. [X4278]

Levis.

LEVIS Popular, new belt, tyre, fine condition; £29.—Collins, Dog, Harvington, Kidderminster. [X4191]

1917 Levis Popular, Lucas lamps, splendid condition; £35.—Potter, 28, Emp Rd., Queen's Rd., S.W.8. [4254]

LEVIS Popular, late 1916, little used, lamps, horn, accessories, spares; 36 gns.—21, Airlie Gardens, Ilford. [4332]

1916 Levis Popular, lamps, horn, etc., T.T. bars, good condition; £33.—Churchill, The Grove, Dorchester. [X3848]

LEVIS—Orders booked now will ensure early delivery of 1919 model.—W. R. Sanders and Co., Ltd., Sanders' Garage, Buxton. [X3647]

LEVIS, 1915, splendid running order, recently overhauled, speedometer, new lamps, etc.; 40 gns.—Avondale, Bath Rd., Woking. [4363]

BABY Levis 2½ h.p., lamp and generator, Bosch mag., new Dunlop (heavy), enamel good, runs well, reliable; 30 gns.—Homestead, Birchenhead. [X4314]

MONEY well spent

Not only do we claim for the **LAYTON GARAGES** "fullest Value for Money Spent" in Motor Cycle purchase, but, in addition, a Service which is **Personal, Courteous, Reliable!**

Here is confirmation—a few extracts from recent letters received from satisfied clients.

"I should like to take this opportunity of expressing my appreciation of the fair, courteous and businesslike manner in which you do your trade as experienced by me, and I shall always be pleased to recommend you."

"Shall only be too pleased to advise anyone to buy from you, for I know that they will get value for their money and A.1 treatment."

"I feel I must write and express my satisfaction with regard to the Combination, also with the straightforward manner in which you have dealt with me. I shall only be too pleased to recommend anyone who desires to be dealt with satisfactorily, to place themselves entirely in your confidence, knowing you will spare no efforts to get them what they desire."

"Your business method is most courteous and friendly, and we are very pleased and satisfied. It is the personal element that you put into the thing that makes dealing with you a pleasure."

And as we have pleased and satisfied others, so can we also please and satisfy YOU.

Write us re A.B.C., Ariel, Blackburne, Enfield, Ivy, New Imperial, Norton, Sparkbrook, and Triumph Motor Cycles, and Hillman, Standard, Singer, and Dawson Light Cars.

The LAYTON GARAGES,
London Rd., BICESTER,
and 90, High St., OXFORD.
Telephone: No. 35, Bicester.

MOTOR CYCLES FOR SALE.

Levis.

LEVIS, 2½ h.p., 1917, done 700 miles, perfect running; best offer over £40.—51, Buckland Crescent, Swiss Cottage, S. Hampstead, N.W.3. [4233]

LEVIS, 2½ h.p., 1914, 2-speed, just overhauled, runs perfectly, fast; 44 gns. lowest.—Wilson, 1, The Sycamores, Wimbledon Common (close King's College School). [X4190]

LEVIS, 1916, Popular Model, excellent condition, fitted new accessories, including Brooks saddle, Klaxon horn, rear brake, toolbag, Blumel pump, Bates tyre and tube, nearly new belt, lamps, generator, etc., complete with tools, spare plug, belt fastener, tin carbide, can petrol, tin Price's oil, etc., engine just overhauled, and will pull anywhere; write for appointment; price £47, or near offer.—Wilson, 116, Springbank Rd., Hither Green, S.E. [4544]

Limited.

12 h.p. Limited, V-shaped, powerful twin, clutch model. This machine is used by the American police to catch miscreants; will do over 80 miles per hour, in first-class condition; price £87/10.—Wauchope's, 9, Shoe Lane, Fleet St., London. [4701]

Lincoln-Elk.

1914 Lincoln-Elk 3½ h.p., running order; £30.—15, Little James St., Holborn, W.O. [4148]

LINCOLN-ELK, 3½ h.p., 1914, overhauled, rebushed, Bosch, heavy Dunlop, new condition and appearance; £40, or nearest.—17, Park Rd., Harringay. [X4472]

L.M.C.

1913 L.M.C. 4 h.p., 2-speed, Kick start, chain-cum-belt; £45.—13, Little James St., Holborn, W.O. [4149]

L.M.C. Motor Cycles.—The motor cycle with the comforts of a car. All models available shortly; demonstration model now in stock.—The sole distributing agents for London and the Home Counties, Mebes and Mebes, the Original Light Car Specialists, 144, 154-6, Gt. Portland St., W.1. [3695]

Lugton.

LUXTON Precision 1913 3½ h.p., clutch, horn, lamps, speedometer, and almost new tyres, £46; also a sidecar for same if required.—89, Abbey Rd., St. John's Wood, N.W.8. [4195]

Martin.

MARTIN-J.A.P., overhead valves, Philipson pulley, Bosch mag., lamp set, spare tyre and tools; £50.—Heather, London Rd., Bromley, Kent. [4632]

Matchless.

MATCHLESS, 8 h.p., racing model, speed 70-80; £70.—40, Victoria Rd., Kilburn, N.W. [4396]

1914 Matchless-Jap, drip, 3-speed, free, Kick start, cane sidecar; £70.—78, Colegate, Norwich. [X3670]

CROW Bros., High St., Guildford, West Surrey agents for the new Matchless.—Order now for early delivery. [4085]

JONES Garage, special agents for Matchless, Broadway, Muswell Hill, N.10, and Woodside Parade, North Finchley. [2921]

MATCHLESS 5-6 h.p. Twin, countershaft 3-speed gear, good condition; £67/10.—370, London Rd., Thornton Heath, S.E. [X4359]

MATCHLESS 8 h.p. C.B. Combination, in perfect order; trial; £100.—92, Benlue Rd., Thornton Heath, Croydon. [4538]

MATCHLESS-J.A.P. 8 h.p. C.B. Combination, 2-speed bundle start, good going order; £105.—4, Trelmont Rd., Croydon. [4410]

MATCHLESS-J.A.P. 6 h.p., T.T., clutch, Kick starter, first-class condition; what offers?—4, College Gardens, Caneon Rd., N.7. [4411]

MATCHLESS 8 h.p. Combination, countershaft chain drive, in excellent condition; £135.—22, Esmond Gardens, Bedford Park, W.4. [4298]

T.T. Sporting Matchless 8 h.p., overhead valves, variable gear, splendid condition; best offer over £80 secures.—Dunn, Photographer, Brechin. [X4246]

8 h.p. Matchless-Jap Combination, sporting cane sidecar, 2-speed, twin belts, stored during war, trial given, seen evenings after 7; £90.—11, Cromer Rd., Romford, Essex. [4065]

8 h.p. Matchless Combination, Victory model, complete spare wheel, etc., delivered 1918.—Hardie, 24, Woodstock St., New Bond St., W.1. Phone: Mayfair 6559. [4354]

MATCHLESS, 8 h.p., 3-speed, Bosch, new hood, screen, speedometer, spare tyre and tube, chain, ready any tour; £145; after 6 p.m.—85, West End Rd., Southall, Middlesex. [4400]

MATCHLESS-J.A.P. 6 h.p. Coachbuilt Combination, Kick start, clutch, 3 speeds, speedometer, 2 lamps, tyres practically new; £90, lowest.—Adams, 13, Grosvenor Av., East Sheen, S.W.14. [4452]

MATCHLESS 1913 Combination, 5-6 h.p., Sturmey-Archer 3-speed gear box, chain-cum-belt, all accessories, practically idle since August, 1914; £80.—Wilson, 8, St. Paul's Sq., Bedford. [X4030]

MOTOR CYCLES FOR SALE.

Matchless.

MATCHLESS Coachbuilt Combination, 6-8-h.p. twin, belt drive, Bosch magneto, 2 speeds, free engine, excellent condition; best offer over £85; see evenings after 5 p.m.—18, Brereton Rd., Bedford. [X4103]

1914 Matchless, 8-h.p., 3 speeds, C.B. Millford sidecar; sell £90, or exchange for lower power combination, B.S.A., Triumph, or good make.—A. Hillery, 25, Hartington Rd., Mableborough, near Rotherham. [4137]

MATCHLESS Combination, War Model 8-h.p., excellent condition, 3 speeds, extra wheel interchangeable, speedometer, hood and screen to sidecar; expert examination welcomed: £145.—Box L1,878, c/o *The Motor Cycle*. [3457]

8-h.p. Matchless-Jap, 1914, sporting solo mount, very fast, not used during war, thoroughly overhauled and enamelled, water-tight Bosch, Senspray, adjustable pulley, no gears, long exhaust; £80.—Brook, 49, Bridge Rd., Molesey. [4489]

SOANS and Duon, 93, Mason's Hill, Bromley, Kent, placed a good contract long ago for Matchless Combinations, and are now booking orders strictly in rotation for earliest possible delivery; be early on our waiting list, satisfaction assured. Phone: Bromley 350. [4068]

1917 8-h.p. Matchless Combination, 3-speed, all wheels interchangeable, first-rate condition, recently overhauled, can be ridden away, spare wheel, wind screen, 2 large head lamps and rear lamp, watch, accessories; 24 hours' notice to view; what offers? cash down.—Hunt, Brondington, Pontypridd. [4568]

Metro.

METRO-TYLER—Sole agents for Hertfordshire, Chondler, Keyze and Williams, Sun St., Hitchin. [0998]

METRO 2-stroke, enamelled Indian red, long exhaust.—Sapsworth, 195, High St., Tonbridge. [X4176]

Minerva.

MINERVA 2½-h.p., mag., ready to ride away; £21.—Baker, Crowland, Peterborough. [4589]

MINERVA, 8-h.p., 2-speed, sidecar, less magneto; £23.—7, Risingholme Villas, Wealdstone. [X3853]

TWIN Minerva, 5-h.p., Bosch, Druids, ready for road; £25.—Thornton, Moor Lane, Sberburn-in-Elmet. [X3855]

2-h.p. Minerva, m.o.v., Amac, battery; bargain, £9, offer.—9, Jubilee Terrace, Broomfield Rd., Chelmsford. [4371]

3½-h.p. Minerva, Bosch, m.o.v., 2½-in. tyres, climbs well; £20.—Kingston, 69, Sydenham Hill, S.E.23. [X4308]

MINERVA 3½-h.p. Motor Cycle, with footboards, good condition; £16.—Livsey, 80, Entwistle Rd., Rochdale. [X4388]

MINERVA 3½-h.p. Bosch, B. and B., large brass tank, overhauled; £29, or offer.—F., 3, Manor Rd., Tilbury, Essex. [4478]

MINERVA 3½-h.p., m.o.v., accumulator, B. and B., ready to ride away; £16.—Busbridge, 7, Providence Place, Long Ditton, Surrey. [4634]

MINERVA 4½-h.p. Big Single, strong sidecar machine, Grado ball thrust gear; only seen after 6 p.m.; no offers; £28/10.—12, Cheshire St., Bethnal Green, E. [4125]

3½-h.p. Minerva and Sidecar, Bosch mag., Amac carburettor, H.B.C. Dunlop tyres, Whittle belt, lamps, carrier, etc., needs slight adjustment; bargain, £20.—Ben, 152a, Swaby Rd., Earsfield. [4421]

MINERVA 2½-h.p., m.o.v., rebuilt by mechanic, low drop frame and tank (new), waterproof mag., B.B. spring forks, horn, engine perfect order, reliable, and very good climber; £21, lowest; photo ad.—Gillett, 37a, Marefair, Northampton. [X4213]

Moto-Reve

2½-h.p. Moto-Reve, fine condition, running order; £25.—3, St. Margaret's Rd., Brockley. [4306]

2½-h.p. Moto Reve, twin, recently overhauled; £25, seen after 5 p.m.—8, 56, Spencer Rd., Wealdstone, Middlesex. [4642]

Motosacoche.

MOTOSACOCHE 2-h.p., Singer frame, carrier, horn; £20, cheap.—168, Havelock Rd., Brighton. After 8 evening. [4248]

New Hudson.

NEW Hudson, 1914, 2½-h.p., 3 speeds, ride away; £45.—Barber, High St., Dunstable, Beds. [4620]

NEW HUDSON 4-h.p., 3-speed, clutch; first £45 secures.—53, Alderman's Drive, Peterborough. [X4220]

NEW HUDSON 1914 2½-h.p., 3-speed, clutch, lamp, good running order; £35.—Saunders, c/o Page and Girling, Melton, Suffolk. [4651]

NEW Hudson-Jap 2½-h.p., overhauled by Prestwich, 3 speeds, F.E., Bosch, B. and B.; £35.—Goodeve, Brightview, Hadley Rd., New Barnet. [4379]

NEW Hudson, 4-h.p., 1914, 3 speeds, clutch, coach-built combination, condition and appearance new; £90.—J. Smith and Co., Glengall Rd., Millwall. [4118]

MOTOR CYCLES FOR SALE.

New Hudson.

2½-h.p. New Hudson, Bosch, B. and B. variable jet, 3-speed, clutch, adjustable pulley, very fast; any trial; ride away; after 6 p.m.: £45.—5, Chapel House St., Millwall, Poplar, E. [4528]

1913-14 3½-h.p. New Hudson-Jap Combination, coachbuilt, 3-speed, free engine, excellent running order; 65 gns., or highest offer.—Sherwood, Kelsale, Saxmoundham, Suffolk. [4660]

NEW HUDSON 1915, 6-h.p. Combination, coachbuilt 2-seater sidecar, 3-speed, kick-start, clutch, lamps, and accessories, all in splendid condition, as new, stored 3 years, only used week-ends; £90, no offers.—Apply, 12, Cranville Rd., Sevenoaks. [4282]

BIG SIX New Hudson, 1914, C.B. sidecar, 3-speed, Bosch, Armstrong hub, kick-start, stored 3 years, excellent condition, recently overhauled, almost new tyres, ready for touring, no lamps, trial by appointment; £130 lowest.—Jones, 5, Greylands, Copthorne, Shrewsbury. [4062]

SPORTING single-cyl. single-speed New Hudson, 3½-h.p., 1911, just thoroughly overhauled and re-enamelled, new semi-T.T. bars, new back tyre and tube, wants Bowden controls fitting, frame head broken through collision, otherwise sound, engine hot stuff; £20 in present condition.—Warner, Woodcroft, Motttingham, S.E.9. [4257]

New Imperial.

CROW Bros., High St., Guildford, invite enquiries for latest New Imperials. [4086]

NEW Imperial—Caffyns, Ltd., Eastbourne, are booking orders for delivery shortly. [0018]

NEW Imperial 2½-h.p., 1916, 2 speeds, wide bars, fast; £50.—Railway Garage, Staines, 'Phone 139. [4004]

NEW Imperial, 1916, 2-speed, complete, electric lighting, numerous spares; 48 gns.—Northwood Cottage, Chislehurst. [4416]

NEW Imperial-J.A.P., 2½-h.p., 2-speed, in excellent condition; £42.—E. Birch, Littlecot, Sutton-at-Hone, Kent. [4196]

1915 2½-h.p. New Imperial-J.A.P., 2-speed, lamp, horn, etc., perfect condition; £42.—Chrchill, The Grove, Dorchester. [X3849]

NEW IMPERIALS. Call and inspect the latest models.—Sole London agents, Rey's, 173, Great Portland St. 'Phone: Mayfair 879. [9677]

NEW Imperial 1917 2½-h.p., 2-speed, condition equal to new; £55.—Smith's, 10-16, Haverstock Hill (opposite Chalk Farm Tube Station). [4671]

NEW Imperial-Jap, 2½-h.p., 2 speeds, new tyres, N. lamps, horn, perfect condition; £47.—Newland, 248, Alderman's Rd., Bermondsey, S.E. [4181]

NEW Imperial-Jap, 1916, semi T.T., 2 speeds, Lucas lamps, knee-grips, Amac; £45; seen Garage, 102, Goose Green, East Dulwich, or write Thomson, 73, Catlin St., S.E.16. [4485]

Norton.

JACK HEALY, Cork.—Norton official agent for the South of Ireland. [X8335]

CROW Bros., High St., Guildford, Norton agents: let us reserve you one. [5301]

NORTON T.T. 3½-h.p., Phillipson, late model, electric lamps, reliable, fast; £68.—Green, Grocer, Reigate. [4500]

NORTON, B.S. model, very fine condition, knee grips, all accessories; £68, no offers.—H., 23, Crockerton Rd., Upper Tooting. [4721]

DAN BRADBURY, 224, London Rd., Sheffield, the well-known Norton exponent and agent, will give you earliest possible delivery of Nortons. [7269]

1914 3½-h.p. T.T. Norton, excellent condition, complete with horn and lamps; £55.—Smith's, 10-16, Haverstock Hill (opposite Chalk Farm Tube Station). [4670]

NORTONS—We are now booking orders for the latest model Norton solo and sidecar outfits; £5 deposit; deliveries in strictest rotation.—Maudes', 100, Gt. Portland St., London, W.1. [5675]

NORTON 3½-h.p., 1915 T.T., Phillipson, Binks, C.A.V., P. and H. head light, horn, rubber grips, tyres and belt in excellent condition, very fast machine; seen evenings after 6; £64.—Rogenhagen, Linden Court, Epsom Downs, Surrey. [4484]

T.T. Norton, 1913, stored 4 years, tank and frame re-enamelled, C.A.V., Phillipson, 1919 B. and B., and new engine parts, long exhaust pipe, lamp, tools, new tyres, ready ride away; £60.—Bell, Abbey Cottage, Cardington Rd., Bedford. [X4334]

1916 Norton 3½-h.p., T.T., Lucas lamps, horn, also Klaxon, recently enamelled, tyres perfect, rear one new, new belt, new large armoured toolbags, accessories, new Senspray carburettor, spare cover, fast, perfect, £75.—Rutter, 84, Park Mansions, Knightsbridge, S.W. [4256]

N.S.U.

N.S.U. 3½-h.p., free engine, kick starter; £43/10.—19, Wilcox Rd., South Lambeth, London, S.W.8. [4392]

N.S.U. 3½-h.p., 2-speed, free engine, swift mount; £35, ride away.—Bert, 163, Walmer Rd., Nottingham Hill, W. [4251]

The "IVY"
TWO STROKE

100%
RESULT.

Sutton Coldfield A.C.
Reliability Trial for
the "Levis" Cup, on
Saturday, May 17th.

TWO IVYS ENTERED

Both ridden by private owners,
Mr. George Dallison and
Mr. Seymour Smith.

TWO IVYS FINISHED

OBTAINING FULL MARKS.

Mr. Seymour Smith riding a
1914 Model Two-Stroke, which
had done many thousands of
miles, obtained

2nd PLACE

winning the Club

GOLD MEDAL

and the Captain's

SILVER SOUVENIR PRIZE.

1919 Catalogue free on application.

S. A. NEWMAN,
LTD.,
ASTON CROSS,
BIRMINGHAM.

THE
ARISTOCRAT
OF ITS TYPE

MOTOR CYCLES FOR SALE.

Rudge.

1913 Rudge Multi, good condition, just overhauled, new tyre, belt, Senspray, Lucas Cyclon; £52/10; approval deposit willingly.—Box 4,162, c/o The Motor Cycle. [X3877]

3 1/2 h.p. Rudge, 2-speed, kick-start, gear box, dynamo lighting, C.A.V., mag., rebushed and enamelled, semi-T.T., sporty, fast; £50, or nearest.—Williams, Tapstone, Church Rd., Farborough, Hants. [4422]

BARGAIN. 3 1/2 h.p. Rudge and C.B. sidecar (new body). 2-speed, Binks, Ruthardt, Dunlop tyres, mileage 4,000, lamps, horn, etc., will separate; cheap, £67/10.—Holland, 28, Lonsdale St., Burnley. 4654

1917 I.O.M. T.T. Rudge Multi, good condition, very fast, Klaxon, Stewart, 1,000 F.R.S., never been lit, knee-grips, spares and tools; sell £75, or exchange good 2 1/2 h.p.—as part.—R. Dabbs, New York, Lincoln. [X4162]

RUDGE Multi, late 1914, and sidecar, P.H. lamps, speedometer, knee-grips, spare tyre, tube, and belt, stored 3 years, perfect running order, climb anything; bargain, £68; after 3 p.m.—101, Grove Lane, Camberwell. [X4316]

RUDGE Multi 3 1/2 h.p., Mills-Fulford sidecar, fine condition, mechanically perfect; exchange (cash) for higher power twin combination, or sell 55 gns. lowest.—Write first, Upstair, 48, Gwendoline Av., Upton Manor, E.13. [4406]

RUDGE 1914 3 1/2 h.p., Binks, semi T.T., straight exhaust, variable pulley, new piston rings, front tyre, tube, also belt, lamps, horn, everything splendid condition, very fast; 55 gns.; trial; can be seen after 7 p.m.—64, Balloch Rd., Catford. [4378]

LIGHTWEIGHT Rudge Bicycle, in good condition, fitted with J.E.S. lightweight engine, complete, nearly new, and in good order, £20; also some new and second-hand motor cycle lighting sets.—R. W. Drummond, The Close, Bedford Rd., Hitchin. [4658]

RIGHT-HAND Sidecar, avoid accidents, coachbuilt, not a scratch, with Rudge Multi 5 1/2 h.p., 1914, like new, 3,000 miles same driver, all accessories, Lucas lamps, spare generators, Jones speedometer with night lamp, 8-day luminous watch, spare paraffin lamps, spare belts, etc.; £100, no offer; in London Mayfair; write for appointment or trial.—Box L2,201, c/o The Motor Cycle. [4355]

Ruffles.

RUFFLES.—Delivery from stock, 2 1/2 h.p., 2-speed.—W. H. Grimes and Co., 18a, Bruton Place, New Bond St., W. [2107]

Sarolea.

SAROLEA 3 1/2 h.p., and sidecar, Roc 2 speeds, Bosch mag., B. and B. carburetter, tyres and belt all in good condition; £35.—Bond, 3, St. John's Rd., Uxbridge. [4162]

Scott.

SCOTT. 1915. W.D. model, £48; Rudge, 1914, clutch, as new, £48.—49, Well St., Hackney. [4683]

SCOTT Combination, overhauled, special sporting sidecar; what offers?—87, High St., Welling, Kent. [4348]

SCOTT. 3 1/2 h.p., coachbuilt sidecar, lamps, speedometer; £70.—Brewer, 45, Madras Rd., Ilford, Essex. [4222]

1915 3 1/2 h.p. Scott and Sidecar, new Palmer tyres and chains; £85.—Webber, 7, George St., Wellington, Som. [4150]

SCOTT. 2-speed, kick starter, 1915, only used little, perfect; £70.—H., 23, Crockerton Rd., Upper Tooting. [4718]

SCOTT 5 1/2 h.p., 2-speed, just overhauled, fine condition, tyres good; highest over £45 secures.—30, Spenser Rd., S.E.24. [4479]

SCOTT, 2 speeds, K.S., Bosch, Binks, sound condition, needs small adjustments; £25.—Deconroy, Frankfort St., Birmingham. [4266]

SCOTT, 3 1/2 h.p., very late 1914, engine, gears, chains, tyres and tubes as new, really good machine; 60 gns.—Hines, 22, Rock St., London, N.4. [X4395]

SCOTT, 3 1/2 h.p., 2-speed, clutch, Bosch magneto, tyres excellent, lamps, horn, just overhauled, also coachbuilt sidecar, nearly new, complete with Scott chassis; £60 lowest.—Glenauldyn, Dixon's Green, Dudley. [X4093]

Singer.

SINGER, 1912, 2 1/2 h.p., Bosch, accessories; 26 gns.—9, Vincent Rd., Croydon. [4553]

SINGER 3 1/2 h.p., clutch model, T.T. handle-bars, complete with lamps, horn, etc.; £45; in perfect order.—Brook, Burnham, Som. [4142]

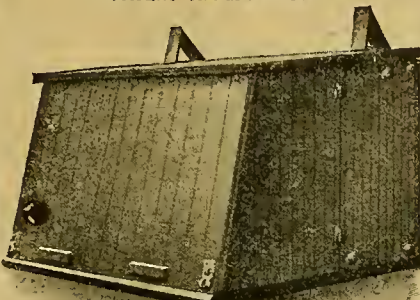
SINGER, 1914, 2 1/2 h.p., Bosch, B. and B., Druids, good condition; £32; after 6.—Meaton, 583, Wandsworth Rd., S.W. [4091]

SINGER 3 1/2 h.p., T.T., excellent condition, new tyres, tube, belt, mileage under 5,000; £55, or near offer.—Stanley Aldiss, Friendly House, East Dereham. [4274]

4 1/2 h.p. Singer, 1914, clutch, 3 speeds, guaranteed perfect, ride away; £58, or exchange for 2 1/2 h.p. Imperial Jap; cash adjustment.—Barber, High St., Dunstable, Beds. [4619]

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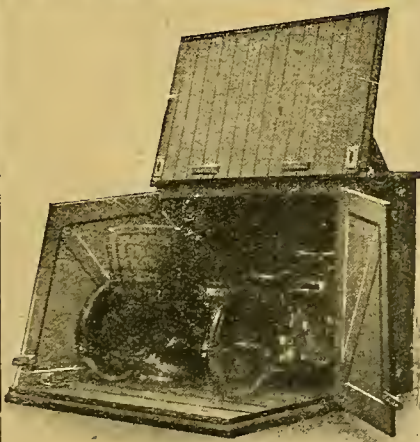
LENGTH .. 8ft. oin.
HEIGHT .. 4ft. 11in.
WIDTH .. 2ft. 8in.

SIDECAR COMBINATION.

LENGTH .. 8ft. oin.
HEIGHT .. 5ft. 5in.
WIDTH .. 5ft. 3in.

Price for Solo Motor Cycle .. £14

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3 1/2 h.p. Singer Combination, beautiful O.B. sidecar, 32 Bosch, B. and B., 3-speed Armstrong hub, tyres nearly new, thorough condition, ready for the road, seen any evening after 5.30, or Sunday mornings; price £70.—Hawes, Sub Rosa, Mentone Rd., Parkstone Dorset. [4576]

Sparkbrook.

1915 Sparkbrook, 2-stroke Villiers, Albion 2-speed, Bosch magneto; £36.—251, Bentley Rd., Doncaster. [X4318]

Sun.

SUN-VILLIERS. 1915, 2 1/2 h.p., 2-stroke, just overhauled; £35.—Vardy, Commercial Rd., Southampton. [X4041]

SUN-VILLIERS 2 1/2 h.p., 2-speed, accessories, perfect condition; £45.—Aiter 7, 98, Ridge Rd., Hornsey, N.8. [4699]

EARLY Delivery from the sole Sun Vitesse Sheffield and District agent, Don Bradbury, 224, London Rd., Sheffield. [7271]

2 1/2 h.p. Sun-Villiers 2-stroke, splendid condition; £38; after 6 o'clock.—Tyson, 29, Stanhope Gardens, Harringay, N.4. [4534]

1916 2 1/2 h.p. Sun-Villiers, good condition, lamps, generator; bargain; ride away; £40.—Post Office, St. Paul's Cray, Kent. [X4346]

1916 Sun-Villiers, 2 1/2 h.p., complete, running order, with all accessories, as new; £35.—W. Hatcher, Britannia, Sunbury, Middlesex. [4220]

2 1/2 h.p. Sun-Villiers 2-stroke, Bosch magneto, Amac carburetter, good running order; £30.—Tomalin, Church St., Long Buckby, Northants. [X4029]

Sunbeam.

1917 Sunbeam Combination, 3 1/2 h.p., little used, first-class condition; what offers.—Box 4,109, c/o The Motor Cycle. [X3569]

1917 3 1/2 h.p. Sunbeam and Sidecar, military model, all-chain, first-class condition; £125.—Huffman, 125b, Adelaide Rd., N.W.3. [4384]

SUNBEAM Combination, 8 h.p., 1918, khaki model, spare wheel, etc.; any trial after 5 p.m.; £160.—5, Elms Mews, Clapham Common. [4464]

1914 Sunbeam, 6 h.p., Gloria sidecar, 3-speed, K.S., lamps, apron, etc., in fine condition; £130; appointment.—Morgau, 51, Blaenauwent, Aberdare. [4455]

SUNBEAM Combination, 1914, just overhauled by makers, hood and side curtains, perfect in every way, small mileage; £150.—Kent, Prestwood, Wednesfield. [X4370]

1918 8 h.p. Sunbeam and best Sunbeam sidecar, spare wheel, splendidly equipped, J.A.P. engine, splashguards, specially built and beautifully kept; £180.—Huffman, 125b, Adelaide Rd., N.W.3. [4385]

3 1/2 h.p. Sunbeam, Aug. 1916, mileage 4,400, speedometer, Klaxon horn, 7 ga. electric lighting set, New Hudson sidecar De Luxe; £120, no offers; would sell separate.—Bridle, Blatchington Rd., Hove. [X4355]

SUNBEAM, 1919, 8 h.p., brand new super 2-seater coachbuilt sidecar, lamps, Klaxon horn, spare wheel, etc.; owner buying car; £200, or close offer; trial run given.—Apply, A.F.M., St. Helen's Court, Gt. St. Helen's, E.C.3. [4083]

SUNBEAM 6 h.p. Combination, 3-speed countershaft, all-chain drive, splendid coachbuilt sidecar, fully equipped, bought 1915, stored 2 years, in exceptionally fine condition throughout; 145 gns.—E., 23, Market Place, Kingston, S.W. [4466]

SUNBEAM Combination, late 1916, M.A.G. 8 h.p. engine, twin-cyl., Sunbeam coachbuilt sidecar with hood and wind screen, magnificent condition, ready to drive away; £150, or nearest offer.—Write to C. Sharpe, 14, St. Simon's Av., Putney, S.W.15. [4206]

6 h.p. Sunbeam Combination, late 1915, perfect condition, Gloria sidecar, hood, apron, seat for child, gas cylinder lighting, head lamps and inspection lamps, electric back light, Brooks suit cases on luggage carrier, speedometer, and spares; £150, no offers.—Apply, Buckley, Printer, Station Rd., Harrow. Phone 172. [4272]

SUNBEAM 3 1/2 h.p. Solo, 1916, black and gold, standard model, Amac carburetter, Thomson-Bennett mag., new Dunlop tyres and tubes, special Lucas electric lighting from 6 volt 30 ampere hour accumulator, Watford speedometer, Smith watch, Stewart mechanical horn, re-enamelled and overhauled by makers last February, general condition absolutely perfect, fast, silent, absolutely reliable, smart; above machine just completed recent London-Edinburgh run without trouble of any kind whatsoever; same owner since first mile, identical with newest 1919 Sunbeams; owner now buying car; complete and ready for the road; first £120 secures; no offers.—Sub-Lieutenant Kidston, R.N., Trinity College, Cambridge. [X4036]

T.D.C.

2 1/2 h.p. De Luxe T.D.C., nearly new condition; 36 gns.—3, Parker Lane, Barnley. [X4421]

T.D.C. 1914 4 h.p., clutch, 3-speed, tools, Dunlop heavies, in splendid running order; £45.—198, Goldhawk Rd., Shepherd's Bush. [4159]

MOTOR CYCLES FOR SALE.

T.D.C.

T.D.C. Motor Bicycle, 2-stroke, single speed, 2½ h.p., 1916 model, Dunlops, good as new; £33/10.—19, Allsop St., Upper Baker St., London, N.W.1. [4702]
T.D.C. De Luxe 1917 2½ h.p. 2-stroke, perfect, belt case, footboards, etc., Amac, Druids, low and fast, ride away; £40; after 5.—41, Briscoe Buildings, Erixton Hill, S.W. [4449]

Triumph.

TRIUMPH, 2-speed gears, splendid condition, 1912.—Sapsworth, 193, High St., Tonbridge. [X4174]
TRIUMPH Baby, new Dunlops, Lucas horn, lamps.—Llewellyn, 39, Hamilton Rd., Salisbury. [4613]
3½ h.p. Triumph, fixed engine, perfect condition; any trial; £35.—20, Grafton St., Coventry. [X4474]
3½ h.p. 3-speed Triumph, lamps, speedometer, as new; offers.—7, Gibson Square, Islington. [4715]
TRIUMPH, 1913-14, excellent condition, any trial; £42/10.—24, Towley Rd., East Dulwich. [4646]
1919 Baby Triumph, purchased May, owner leaving district; £56.—181, High St., Plumstead. [4346]
3½ h.p. Triumph, 2-speed, free engine, sidecar, good condition; £48.—3, Rothsay Rd., Luton, Beds. [4512]
1919 Triumph, T.T. bars, not done 10 miles; offers.—H., 23, Crockerton Rd., Upper Tooting. [4722]
3½ h.p. Triumph and Sidecar, clutch, L.e., ride away; £47.—48, Prince George Rd., Dalston. [4709]
4 h.p. 1914 Triumph, clutch model, Philipson pulley; £255.—Urgent, 27, Somerfield Rd., Finsbury Park. [4687]
3½ h.p. T.T. Triumph, dropped frame, new tyres and belt; bargain, £45.—A. Morsey, Kessingland. [4462]
TRIUMPH, clutch, torpedo sidecar, accessories; £38, bargain; after 6 o'clock.—51, Cowper Av., Sutton. [4746]
TRIUMPH.—Triumph spare parts supplied by Coventry Motor Mart, Ltd., London Rd., Coventry. [X061]
TRIUMPH, 3½ h.p., 1913, 3 speeds, clutch, sidecar, lamps, etc.; £75.—J. Smith and Co., Gleggall Rd., Millwall. [4117]
T.T. Triumph, fixed engine, perfect, and canoe sidecar; £36, bargain.—G., 16, Temperley Rd., Balham S.W.12. [4351]
TRIUMPH, 1910, excellent condition, 2-speed gear, light wicker sidecar to suit.—Parker's, Bradshawgate, Bolton. [X4399]
JONES' Garage, special agents for Triumphs, Broadway, Muswell Hill, N.10, and Woodside Parade, North Finchley. [2927]
TRIUMPH 4 h.p., 3-speed, new Dunlop tyres, excellent condition; £48.—Griffith, West Knoyle Rectory, Mere, Wilts. [4344]
1914 Triumph, clutch, 3-speed, Canelet sidecar, in perfect condition, lamp, horn; £85.—7, Moyers Rd., Leyton, E.10. [4451]
4 h.p. 1914 Triumph Motor Cycle, Sturmer-Archer 3-speed, clutch, very good condition; £60.—Fuller, Grocer, Malton. [X4307]
TRIUMPH 4 h.p., brand new 1919 T.T. roadster, not ridden; offers over 275 to J. Llewellyn, Downhill Farm, Hinton, Evesham. [X4404]
TRIUMPH 4 h.p., countershaft, mechanical horn lamps, end tools; ride away; £85, cash; no offers.—59a, Church Rd., Erixton. [4304]
TRIUMPH, 1912, single gear, T.T. bars, good condition; £45; exchange.—Hilton, Sharp and Co., Ltd., Foxhall Rd., Blackpool. [X4414]
TRIUMPH, 3½ h.p., 1913, free engine, perfect condition, tyres, enamel, plating, good as new; price £45.—Ford, Mills, Pembroke. [4440]
1913 Triumph, semi-T.T., clutch, speedometer, lamps, tyres good, lowest condition; £50; after 6.—Brynmor, Throwley Rd., Sutton, Surrey. [4565]
TRIUMPH 3½ h.p., clutch, Bosch, lamps, horn, engine and tyres good condition; £45.—Wilcox, 12, Nottingham Rd., Melton Mowbray. [4333]
TRIUMPH, 3½ h.p., single speed, splendid running condition, recently overhauled; £30.—Llewellyn, Priory, Norwood Green, Southall. [X4231]
TRIUMPH, late 1914, coachbuilt sidecar, Lucas accessories, perfect condition; any trial; £85.—Anderson, 125, High St., Merton. [X4312]
TRIUMPH 3½ h.p., Bosch, B. and B., fixed gear, tyres excellent, ride away; £32; after 6.30.—Parkyn, 644, Fulham Rd., Fulham. [4163]
TRIUMPH Coachbuilt Combination, new this year, fully equipped, equal to new; £120, or exchange.—Bunting, Mason's Av., Harrow. [4458]
TRIUMPH 3½ h.p., 1909, just overhauled, new cylinder, piston, etc., lamps, good appearance; £28.—J. Mackenzie, 15, Saller St., Chester. [X4345]
TRIUMPH, 3½ h.p., just been overhauled, new Dunlop tyres, enamelled khaki; trial; £45.—Daniels, Loughton, Bletchley, Bucks. [X4329]

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1913 BRADBURY and Sidecar.
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TRIUMPH, 1913, clutch, enamel and plating excellent, fast.—First cheque to Lt. Cunningham, 26, Leicester St., Southport, 48 gns., secure. [X3868]
T.T. Triumph, 1912, not done 5,000 miles, in good condition everywhere; £45.—W. H. Grimes and Co., 18a, Bruton Place, New Bond St., W. [4605]
1913 Triumph 3½ h.p., 2-speed, new tyres, with good sidecar, will take 3 up any hill, in perfect condition; price £60.—Rowles, 61, Milton, Oxon. [4175]
TRIUMPH, clutch, 3-speed gear, wants adjusting very slightly, Bosch mag., good gear, new tyres and belt; £38.—Box L2,162, c/o The Motor Cycle. [4190]
TRIUMPH 1912, clutch model, lamp, horn, and speedometer, new tyres and tubes, very good order; £38, or nearest offer.—Newman, 20, Stall St., Bath. [X4138]
TRIUMPH 3½ h.p., 1912, clutch model, excellent condition, little used, good tyres, spares, accessories; £48.—12, Fontaine Rd., Streatham Common, S.W. [X4285]
1915 Triumph 4 h.p., 3 speeds, semi T.T. bars, long exhaust, speedometer, accessories, condition perfect; price 74 gns., or nearest offer.—Penarth Villa, Penarth. [4147]
TRIUMPH Combination, 3 speeds, kick starter, 3 new tyres, excellent condition; £60.—21, Astwood Mews (minute Gloucester Rd. Station). Phone: Western 1592. [4679]
1914 4 h.p. Triumph, 3-speed, Lambert coachbuilt sidecar, small mileage, excellent condition, accessories; £80, or best offer.—Iris Cottage, Garden Suburb, Leicester. [X4214]
TRIUMPH, 3½ h.p., 1912, good condition, easy starter, overhauled last month, very fast, ride away; £35.—Sergt. Murphy, Codars, Belmont Hill, Lewisham. [4053]
TRIUMPH, 1913, all-black, 2-speed, free engine, N.S.U. gear, splendid condition, excellent running order, ideal sidecar machine; £42.—209, Broadway, West Hendon. [4488]
TRIUMPH Combination, 1914, 3-speed, in excellent condition, £85; also 7.9 h.p. Indian combination, 1914, clutch model, £90.—Pring, 47, Rowan Rd., Hammersmith. [4107]
TRIUMPH, 3½ h.p., free engine, recently overhauled, T.T. bars, long exhaust pipe, very fast, tyres practically new, full accessories; £47/10.—Obey's Garage, Twickenham. [4186]
1919 Triumph 4 h.p., countershaft, kick start, Lucas lamps, condition perfect, under 1,500 miles, complete outfit; price £95.—Wright Richards, Park Corner, Ewell, Surrey. [4382]
£38; 1915 4 h.p. Triumph, countershaft, Sturmer-Archer, 3-speed, less mag., carburettor, rusty condition.—Spechler, 1, Gunnersbury Lane, Acton Hill, London, W.3. [4608]
3½ h.p. Triumph, 1913, single speed, clutch, all black, £2 almost new tyres, lamp, horn, and accessories; ride away; £42.—Hughes, 26, Stuart Rd., Kempston, near Bedford. [X4219]
3½ h.p. Triumph, 1912, F.E., lamps, tools, adjustable pulley, Bosch, tyres and belt as new, well kept, condition excellent; £40.—Cossins, Tarrant Rawston, Blandford, Dorset. [X4261]
TRIUMPH, 1911-12, 3½ h.p., C.B. combination, 2 speeds, nearly new tyres, just overhauled, all in splendid condition; £58; trial.—47, Houston Rd., Brownover, Rugby. [X4371]
TRIUMPH 2-stroke, 1915, excellent mechanical condition and appearance, new tyres and tubes, lamps and horn; £57/10.—Wright, 2, Milton Rd., East Sheen, S.W. [4503]
TRIUMPH, 4 h.p., 3-speed; £42; will exchange with cash or buy late Enfield combination, 6 or 8 h.p. Phone: Palmer's Green 124.—Peters, 54, Hoppers Rd., Palmer's Green, N.13. [4323]
1919 Triumph, 4 h.p., new April, Millford sidecar, wind screen, lamps, horn, and spares; what offers? buying light car.—Briggs, 23, Burlington Terrace, Bradford, Yorks. [X4381]
TRIUMPH, 1913, 3½ h.p., clutch model, excellent condition, stored during war, spares, accessories; £50; after 7 p.m.; no offers.—Mitchell, 47, Verbury Rd., Tufnell Park, N. [4548]
1912 3½ h.p. Triumph, single speed, just overhauled, very fast and powerful, smart appearance; first cheque £38/10 lowest.—Saunders, Church Lane, Kelsall, Saxmundham, Suffolk. [4662]
FAST Triumph, engine built in sporting T.T. frame, painted yellow, purple disc wheels, lamps, horn, splendid condition; offers over £58. Wanted, Moncear.—Houghton, Abbots Bromley, Staffs. [X4235]
1919 Triumph 4 h.p., countershaft, not done 100 miles, lamps (Miller), horn, all accessories, Dunlop tyres, unpunctured, perfect condition; best offer over £95.—K.D., Regent House, Greenhithe, Kent. [4377]
TRIUMPH 1919 4 h.p. and Gloria Sidecar, Lucas horn, 3 sets lamps, cyclometer, absolutely new, only ridden 40 miles; £145.—Write for appointment to view, Phillips, Oakside, Kewferry Rd., Northwood, Middlesex. [4412]

HOODS, WIND SCREENS, ETC.

£2.—Large hood with side curtains for sidecar.—14, Stewart St., Nuneaton. [X4210]

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MIDDLETON'S Sidecar and 3½ h.p. Zenith driven by Mr. Fenn; gold medal Edinburgh run.

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MONTGOMERY 2-seater, heavy chassis and grid; 23 gns.—895, Fulham Rd. [4105]

SIDECAR, good condition, suit any machine; £6/10.—1, Priory Rd., Kew Green. [4637]

SIDECAR and Chassis, in good condition; £8/10.—138, Church Rd., Battersea. [4362]

TRIUMPH Special Sidecar, absolutely new, just delivered; £33/10.—Norton, Llandrindod Wells. [4684]

CANOELET Sporting Sidecar, tyre unworn; £15.—25, Ormiston Rd., Shepherd's Bush, W. [4276]

CANE Sidecar and Chassis; £8/10. After 6.30.—58, Wellington Row, Bethnal Green, E. [4552]

2-SEATED Sidecar Body, off Harley-Davidson, good order; £5.—Batchelor, Clarence St., Kingston. [4438]

WICKER Sidecar Body, upholstered, good condition; 30/.—Turner, 27, Mattock Lane, Ealing. [4469]

COACHBUILT Sidecar, featherweight, 26×2½ wheel, good condition; £6/15.—16, York St., Dover. [4389]

PERFECTION Coach Sidecars; £16/16.—Halifax Motor Exchange, Union St. South, Halifax. [4262]

NEW Phoenix 2-seater, 12 gns.; new Deafance, coachbuilt; 8 gns.—202a, Hammersmith Rd. [4104]

SCOTT Metal Sidecar, W.D., 650×65, enamel, upholstery good; £12.—R., 92, Romford Rd., Stratford. [4535]

CORONET Sidecars. Send for illustrated catalogue.—Booth's Motories, Portland Place, Halifax.

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BASTONE'S for Sidecars at low prices.—228, Pentonville Rd., King's Cross, London, N.1. [8816]

LIGHTWEIGHT C.B. Sidecar, splendid condition; 15 gns.—Dowdall, 185, Fentiman Rd., Vauxhall, S.W. [4132]

SUNBEAM Coachbuilt Sidecar, large, 1918, as new; £25.—Rose, 43, Newton Rd., Bitterne Park, Southampton. [X4288]

LIGHT wicker Sidecar, complete with apron, 26×24, good condition; £5/10.—Homestead, Birehington. [4649]

CHATER-LEA Cane Sidecar, £6/10; also tradesman's sidecar chassis, £4, good tyres.—21, Brent St., Hendon. [4318]

SIDECAR, good condition, £4/10; luggage grid, 12/6; Triumph wheels, 10/—; engine, 35/—; Prout, Canou St., Tannou. [4339]

SEMI-UNDERSLUNG Chassis, good condition, £4/10; fit any machine.—Lightfoot, 314, Gray's Inn Rd., London. [4343]

GLORIA Coach, underslung sprung wheel, condition perfect and new; accept £23.—49, Althorp Rd., Wandsworth Common. [4719]

COACHBUILT Sidecar, as new throughout, roomy but not heavy, sprung wheel; £16.—49, Althorp Rd., Wandsworth Common. [4720]

CANOE Shape Cane Sidecar, good condition, 4-point suspension, good tyre, 26in. wheel; £6/10.—Jackson, George Hotel, Chesham, Bucks. [4320]

SIDECAR, coachbuilt, French grey, side door, wind screen, good condition; £12; first cheque secure.—Jagger, Cloughton St., Kidderminster. [4420]



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RAYBECK Invalids' Hand-propelled Tricycles. Stumey-Archer 3-speed gear, Dunlop tyres; catalogue free.—Harry Rayner, 10 and 12, George St., Blackpool. [X2249]

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CYCLE Car, 6h.p. 2-seater, good running order; £45.—Bell, Main St., Farnet, Peterborough. [X4336]

MORGAN. Delivery wanted of new 1919 model, good price given.—14, Goodison Av., Liverpool. [X4222]

3-SPEED 9h.p. Water-cooled Runabout, splendid condition; £55; after 6.—48, Church St., Luton. [X4236]

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HUMBERETTE, 1914, A.C., acetylene lamps, speedometer, smart; £150.—Railway Garage, Staines. [4741]

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PHENIX Double Sidecar, good condition, wind screen.—Hanck, 52, Redbrink Crescent, Barry Island, near Cardiff, S. Wales. [4227]

8 h.p. Chater-Lea Cycle Car, 3-speed, chain drive, lamps, hood, screen, smart, fast, reliable; £85.—3, Park St., Wellington, Salop. [X4236]

CARDEN Cycle Car for sale, 2-speed, overhauled, repainted, disc wheels; £90; exchange Zenith.—45, Pember Rd., Kensal Green. [4133]

10 h.p. w.c. 2-speed Rexette Twin, Bosch waterproof, tyres good, wheel steering; £21, or separate.—Smith, Plumber, Wivelshoe, Essex. [4209]

10 h.p. Riley Cycle Car, 2-cyl., water-cooled, mag., 5 wire wheels, lamps, perfect; sell or exchange combination.—Baker, Crowland, Peterborough. [4588]

SIDECAR (wicker), good condition, good tyre and tube, 2 new storm aprons, complete; £47.—Attree, 51, Stannore Rd., Stevenage, Herts. [X4211]

HUMBERETTE, 1914 model, hood, screen, lamps, tools, etc.; £135.—C. H. Parkes and Co., 27, High St., Notting Hill Gate, London, W.1. [4530]

A.C. Warwick Carrier, suit any tradesman; what offers; exchanges entertained.—Speechley, 1, Gunnersbury Lane, Acton Hill, London, W.3. [4610]

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SIDECAR, suitable for 2½ h.p. F.N. or other low-power motor cycle; also 4 h.p. Humber water-cooled tricar.—Heath, Salford Priors, Warwickshire. [4184]

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A.C. Sociable, 1911, new engine 1913, lamps and spares, thorough running order, ready drive away; £40.—Wood, 42, Park Rd., Sittingbourne. [X4104]

CYCLE Car, 2-seater, excellent condition, new tyres, hood, lamps, and horn, 8 h.p. J.A.P.; bargain at £95; seen except Saturday.—English, Clowne, Chesterfield. [X4035]

COACHBUILT Sidecar, Burbury, green colour, 26in. wheel; bargain £13; seen after 5.30 or 1 Saturday.—41, Lambton Rd., Hornsey Rise, London, N.19. [4224]

MORGAN Grand Prix, late 1914 or early 1915, overhauled, fast, complete with hood, screen, lamps, and horn; £155.—The Layton Garages, Bicester. [X4327a]

9 h.p. Cycle Car, De Dion, w.c. engine, with clutch, gear box, and differential complete, partly dismantled and minus tyres; what offers?—Kirkham, Oak House, Grov Rd., Surbiton. [4051]

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TWEENEY 2-seater Cycle Car, 6 h.p., water-cooled engine, friction and chain drive, fast, powerful, in good condition, hood, screen, electric light; £125.—12, West Holme, Northumberland Heath, Erith, Kent. [4293]



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SINGLE-SEATER Car, wheel steering, enclosed all-chain drive, 3 speeds, clutch, De Dion engine, magneto, built 1912, economical, 80 miles p.g. reliable; £65.—Jones, 12, Alexandra Grove, North Finchley. [4059]

8 h.p. Precision Runabout, 3-speed gear and clutch, handle start, coachbuilt body with hood, screen, lamps, etc., beautifully made, for one person only, very fast and quite reliable; bargain at £105.—Wanchope's, 9, Shoe Lane, Fleet St., London. [4700]

GLOBE 2-seater, 8-10 h.p., Aster water-cooled, Claudel Hobson, dual ignition, 2-speed, reverse, tyres and tubes in first-class condition (1 new cover), Stepney, lamp, horn, hood, screen, overhauled last month, splendid mechanical condition and appearance; believed to be 1913 model; really a bargain, £125.—Allen, Excise, Keith, Scotland. [X4402]

CARDEN Monocars, 1919 models; deliveries daily.—The Railway Garage, Staines (Phone 139), sole concessionaires, command these ideal little runabouts as thoroughly practical for pleasure, for professional, or commercial use. The protection of a car at the price of a motor cycle. Fast, silent, no starting handle; a lady can operate the seat kick starting with ease. Specification, 8 h.p. J.A.P. engine in front, 3-speed Sturmey-Archer gear box, all controls inside, perfect accessibility, removable scuttle, economical, 50-60 m.p.g., Dunlop tyres, 105 gaa.; accessories and tandem seat extra; delivery in strict rotation, about one month from receipt of deposit with order. Call and take trial run. [3311]

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PALMER'S Garage, Tooting.—20-25 h.p. Rochet-Schneider 2-seater, new tyres; £500.

PALMER'S Garage, Tooting.—20 h.p. Cadillac 5-seater, hood, screen, detachable rims; £275.

PALMER'S Garage, Tooting.—30-40 h.p. Napier 6-cyl. chassis; £200.

PALMER'S Garage, Tooting.—25 h.p. Withers landaulet, Aster engine, fast, powerful; £425.

PALMER'S Garage, Tooting.—30 h.p. Vauxhall cabriolet, 6-cyl., wire wheels; £750.

PALMER'S Garage, Tooting.—20 h.p. Imperia 2-seater, ready for service; £175.

PALMER'S Garage, Tooting.—15-20 h.p. Ford delivery van, excellent condition; £170.

PALMER'S Garage, Tooting.—17-24 h.p. 1915 Unic ¼ landaulet, overhauled; £725.

PALMER'S Garage, Tooting.—12-18 h.p. 1914 Unic torpedo 4-seater; £675.

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PALMER'S Garage, Tooting.—15 h.p. Corre De Dion touring car; £185.

PALMER'S Garage, Tooting.—5-6 h.p. A.C. tradesman's carrier, requires attention; £20.

PALMER'S Garage, Tooting.—16-20 h.p. Humber landaulet, requires a little attention; £150.

PALMER'S Garage, Tooting.—18 h.p. Cadillac landaulet, artillery wheels, good tyres; £250.

PALMER'S Garage, Tooting.—40 h.p. Crossley delivery van, twin solids back; £175.

PALMER'S Garage, Tooting.—35 h.p. Gebron-Brillie delivery van, requires slight attention; £80.

PALMER'S Garage, Tooting.—20-25 h.p. Milnes-Daimler delivery van, new Orleans engine; £200.

PALMER'S Garage, Tooting.—16-20 h.p. Zedel touring car, good tyres; £150.

PALMER'S Garage, Tooting.—10-12 h.p. Spyker, 4-cyl. monobloc engine; £275.

PALMER'S Garage, Tooting.—20-25 h.p. 3-ton De Dion lorry; £225.

PALMER'S Garage, Tooting.—24-30 h.p. Wolsley lorry, W.D. body, beautiful order; £600.

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PALMER'S Garage, Tooting.—Three 30-40 h.p. Belsize lorries, W.D. bodies; each £375.

SMART 2-seater Car, 10 h.p.; £267; ready drive away. 95, Upper North St., Brighton. [X4592]

8 h.p. Rover Car, magneto, good tyres, repainted; £70.—T. W. Shaw, Wellington, Salop. [X4237]

8 h.p. Rover Car, 2-seater, ready to drive away; view by appointment only.—Scholefield, Nantwich. [X4349]

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CLUTCH Cone (with liolog), for 1913 Douglas 2½ h.p., 2-speed, free engine.—Banyard, 16, Broadway, Ealing. [4408]

£40 Offered, lightweight Enfield, Triumph, or other well-known make.—Fullest particulars, 125, High St., Woolwich. [X5864]

COMBINATION, about 6h.p., not later than 1916; no dealers.—Write, Capt. Gordon, 15, Pelham Place, S.W.7. [4239]

WANTED, motor cycle or combination, condition immaterial; spot cash.—G.H., 168, Green St., Forest Gate. [4569]

WANTED, 1914 or later, good strong combination, 3-speed countershaft.—Palmer, 15, Clay Hill, Bushey, Herts. [4292]

WANTED, 4-cyl. F.N.'s, T.A.C.'s, T.M.C.'s, Hendersons.—Wandsworth Motor Exchange, Eboer St., Wandsworth. [4497]

WANTED, Hobart 2½ h.p. piston complete, 4-stroke; also 24x2in. heavy cover.—Mardon, 90, Adderley Rd., Leicester. [X4392]

WANTED, 8h.p. air-cooled V two engine suitable for cycle car, also clutch.—Moody, 122, Bromyard Rd., Worcester. [X4112]

WANTED, magneto (single-cyl.), Klaxon, speedometer; cheap.—Ashby, 89, Blackhorse Rd., Walthamstow. [4582]

6 h.p. Indian Fork Rod Roller Cage (big end) or connecting rod (complete).—Box L2,227, c/o The Motor Cycle. [4730]

WANTED, Indian semi-T.T. handle-bars in exchange for touring type.—Gardner, c/o Coley, Leicester Rd., Nuneaton. [4461]

WANTED, front main attachment for Montgomery sidecar, with union nut.—123, Mount Pleasant Rd., Ebbw Vale. [4459]

£80 or more waiting.—Wanted, Sunbeam 3½ h.p., first-class condition.—44, Hop Exchange, Southwark St., S.E.1. [4230]

DOUGLAS, late model, T.T. preferred, must be in good order; no fancy price.—Schafer, Cheadle Heath, Stockport. [X4056]

LIGHTWEIGHT or Combination wanted, not earlier 1912.—1, Bells Garden Rd., Peckham. Write or call after 7 p.m. [4656]

TO Harley-D. Agents.—Can anyone supply new sprockets (4) for Model 11F?—Sowdon, Drayton Manor, Abingdon. [4167]

LEVIS Popular, perfect condition, complete accessories, not earlier 1917.—Green, "Knighton," Cheddar, Somerset. [4200]

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GOOD Combination at once, Indian preferred, not over £75; state year.—Chadwick, 52, Nevell's Rd., Letchworth, Herts. [4217]

WANTED, kick starter, complete, for 7-h.p. Indian, 1913-1914 non-sprung model.—Gimmell, 20, Albion Crescent, Glasgow. [X4406]

WANTED, T.T. Norton or Rover, Philipson, fast and perfect.—Finchett, 13, Hartley St., Higher Openshaw, Manchester. [X4193]

FOR 1912 Clyno 6h.p., back hub, or wheel complete, high gear, drum and sprocket (for gear box).—Orchard, Weymouth. [4273]

£60 Spot Cash for late 4 to 7h.p., twin solo; no dealers.—Write or 'phone (Syd. 375), Salmon, Stationer, Sydenham. [4386]

BINKS 3-jet Carburettor wanted, suit Clyno 6h.p. twin, also 26in. speedometer.—19, Wilcox Rd., South Lambeth, London. [4393]

SIDECAR, coachbuilt, underslung (preferably Millford), suitable for 3½ h.p. Singer.—Litchfield, 2, Liskeard Gardens, S.E.3. [4631]

WANTED, immediately fast combination, Harley, Henderson, Indian preferred; cash waiting.—Else, Dimple, Matlock. [X4330]

COUNTERSHAFT Model Triumph, with or without sidecar, would consider 2-seater car.—65, Kintons Rd., Goodmayes, Essex. [X4106]

HARLEY Combination or equal wanted, any condition; particulars and lowest price.—Sgt. Belcher, Ordnance, Ashford, Kent. [4197]

WANTED, 1914 2½ h.p. 2-speed Douglas, must be genuine throughout.—Byrne, Carubrea Cottages, Durriogton, near Salisbury. [X4216]

WANTED, motor cycle with sidecar preferred, 4h.p. or over; must be in good condition.—F. J. Cook, Furze Hill, Wimborne. [X4573]

WANTED, grey coachbuilt sidecar, suitable Harley-Davidson; also another, condition immaterial.—767, Fulham Rd., S.W.6. [3711]

WANTED for cash, lightweight, repairs not objected to, full particulars and price.—Box L2,234, c/o The Motor Cycle. [4738]

WANTED, firm to build small cars on cycle lines, an entirely new design; can be made very cheap.—Freestone, Saffron Walden. [X4391]

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WANTED, Powerful or good 1915 Indian combination, sporting or touring.—Felgate White, 83, Church Lane, Charlton, S.E.7. [4301]

ANY Good Make of motor cycle, combination, or solo, in first-class condition.—Apply, 37, Duleham Mews, Belsize Lane, Hampstead, N.W. [X1256]

WANTED, combination, solo or lightweight; will bring cash upon receipt particulars, price, etc.—G., 107, Burnwood Lane, S.W.17. [X4042]

WANTED, Bosch magneto, single-cyl., new or second-hand.—State lowest cash price to H. Wright, Harbour Rd., Kilkeel, Co. Down. [X4161]

WANTED, magneto, 55° twin, for 5-h.p. Clyno, watertight, also B. and B. carburettor, suit same.—Pace, 1, Centre Av., Acton. [4740]

WANTED, Indian, solo or combination, not earlier than 1914, rigid frame, perfect condition.—(G) Carlingford, Strines, near Stockport. [4446]

CORBIN-BROWN Speedometer, rear drive cable and fitting for spring frame Indian; also Roughrider grips.—Kennedy, Hascombe, Snrre. [4404]

ENGINE, complete with magneto, carburettor, and pulley, 2½ h.p. or 3½ h.p.—Full particulars to Box L2,229, c/o The Motor Cycle. [4732]

£40 Offered for 3½ h.p., 2 speeds, kick starter, wicker sidecar, P. and M. or similar; not hub gears; deposit system.—Harrman, Somerton, Som. [4302]

BAT-J.A.P.—Wanted, 6h.p. 1913 frame, wheels, tank, mudguards, good condition.—Williams, Watchmaker, 57, Crwys Rd., Cardiff. [X4101]

COUNTERSHAFT for Swift 7-h.p., 3-speed and reverse gear box; high price for right article.—Turner, Wallop, Stockbridge, Hants. [4160]

WANTED, a good lightweight Enfield, Calthorpe, or Douglas, must be in good condition.—Write, Clifford 14, Harrington Sq., N.W.1. [4554]

WANTED, cylinder 4½ h.p. 1915 Harley-Davidson, cylinder from twin would suit; also chains and sprockets.—Cowley, Butcher, Malvern. [4536]

LEVIS or other good 2-stroke, must be in perfect order, not earlier than 1915; £25-£28.—J. Heygate, Manor House, Eton, Windsor. [X4037]

WANTED, 3½ h.p. N.U.T., 2½ h.p. Douglas, or 3h.p. Enfield, not earlier than 1916; cash waiting.—Watkins, The Vale, Congleton, Cheshire. [X4194]

GOOD Enfield Combination wanted at reasonable price; any reply greatly appreciated.—River View, Puddock Bridge, Ramsey, Huntingdon. [4557]

WANTED, motor bike, 6h.p. to 8h.p., or about 3½ h.p., good condition and modern; reasonable.—Elliott, Whitebrook, near Mounmouth. [4456]

WANTED, mageto and intermediate timing cogs for 6h.p. 1911 model N.S.U., also twin magneto for same.—9, Gore's Buildings, Whitehaven. [X4135]

WANTED, inlet and exhaust valves for 6h.p. Rudge Multi, 1913 model.—Anderson, Aethy-farld, Saw Mill, Lesmahagow, Lanarkshire. [X4256]

WANTED, reliable machine, 3½ h.p. to 4½ h.p.; reasonable price; no dealers.—Write, call, A.J.D., 83, Woodstock Rd., Chiswick, W.4. [4546]

MODERN Light Sidecar with coupling logs, fit 1915 Triumph; hand control for Philipson pulley.—N. The Havea, Kew Rd., Richmond, Surrey. [4538]

WANTED, latest Enfield combination, part exchange 1918 Levis Popular if desired, otherwise cash.—11, St. Michael's Rd., Bourne-mouth. [X4290]

WANTED, 1911 or 1910 Douglas crankshaft, 1 connecting rod with bushes, good condition.—Gibson, 106, Graoge Rd. East, Middlesbrough. [X5873]

ADVERTISER requires good motor cycle, 1914 or later, known make; immediate cash; state full particulars.—Cyclist, 142, Corhy St., Finsbury Park. [4201]

WANTED, Armstrong 3-speed hub gear, Mark V., with or without wheel; state price and condition.—Seymour, Farrengalway, Kiosale, Co. Cork. [X4139]

WANTED, C.B. Sidecar suitable for Zenith 7-h.p.—Reply, stating condition, points, price, etc., Firman, 16, Camp View, Bonnyrigg, Edinburgh. (D) [4077]

7-h.p. Harley-Davidson Combination, not earlier than 1916, other good make considered.—Write, Hargreaves, Fero Villa, Warrington Rd., Prescott. [X4198]

WANTED, for cash, motor cycles, any known make, not necessarily in running order; good prices given.—Write or call, Tintin, 2, Balham Hill, S.W.12. [4690]

WANTED, 22in. or 24in. foot bellows and tin, blow-pipe, also enamelling oven for gas, 3ft. 6in. or larger.—Pendleton, 28, Loosdale Sq., Liverpool Rd., N.1. [4286]

WANTED.

HARLEY-DAVIDSON, electric, wanted immediately, solo or combination, 1916 or later.—Full particulars and price to Thomson, 4, Park Rd., Forest Hill, S.E. [4448]

B.S.A. or any other good make combination, must be in tip-top condition, not earlier than 1916; cash waiting.—Bartford, 183, Westminster Bridge Rd., S.E. [4163]

WANTED, 3h.p. Enfield, Model E Lewis, or good 2-stroke, 2-speed; full particulars, with lowest cash price.—39, Westbourne Rd., Munningham, Bradford. [X4584]

WANTED, clearance and bankrupt parcels of motor cycle accessories;—whole stocks purchased; must be cheap.—Harris, 51, Upton Lane, Forest Gate, London, E.7. [9719]

FOR F.N. Lightweight, main forks, front wheel fly-wheel cover, tubular stand and carrier, mudguards.—106, Barlow Moor Rd., West Didsbury, Manchester. [X4203]

WANTED speedometer, Stewart or Corbin-Brown, 26in. wheels, back wheel drive, tank fittings, must be in good condition.—Schater, Earliston Rd., Wallasey. [X4098]

MODERN Horizontally Opposed Power Unit, complete, not exceeding 6h.p.—State make, date, and price to Kingsley-Pollant, 17, St. George's Rd., E. Twickenham. [4241]

IF You Want to sell your cycle, motor cycle, magneto, or parts, we can quickly find you a customer at your own price.—The Mart, 151, Caledonian Rd., King's Cross, London. [1589]

WANTED immediately, rear cylinder for 2½h.p. Enfield twin, 1913, 2-speed, parts and spares also; good price paid.—Hinchliffe, Victoria St., Stocksbridge, Sheffield. [X4044]

WANTED, F.N. combination, easily attachable and detachable sidcar, good condition; about £45; no dealers.—Smith, 14, Tidbury St., Stewart's Rd., South Lambeth, S.W.8. [4563]

TWO N.S.U. Gears, to fit 1909 Triumph and 8h.p. J.A.P., 1912, cylinder and piston complete for 1909 Triumph, must be in good condition.—Box 4,178, c/o The Motor Cycle. [X4407]

WANTED immediately, for summer holiday, good combination, essential good condition; send full particulars to save time when answering.—Box 1,285, c/o The Motor Cycle. [4259]

GOOD Motor Cycle or Combination, Indian preferred, two Matchless, Zenith, or T.T. Bat, or 3-speed Triumph; full particulars and lowest price.—Motor, 45, Hathaway Rd., Croydon. [4429]

WANTED, frame, in sound condition, for Douglas motor cycle, lady's model, 1912, or Douglas lady's model not earlier than 1912, in good order.—Muirhead, Alma House, North Shields. [X4144]

£20-£50—Cycle car or chassis, no objection to overhauling or assembling, must be capable of being put into running order by amateur mechanic.—3, South View, Barnard Castle. [X4052]

WANTED, Coachbuilt Combination, 5-6h.p., good make, about 1915, 3-speed, good condition; about £60; no dealers, any evening.—Martin, 25, Endeleigh Rd., West Ealing. [4058]

GENTLEMAN requires really good solo mount or combination, not earlier 1914; write full particulars; distance no object.—20, Clifton Gardens, Golder's Green. No dealers. [4596]

£50-£60 offered for 5-6h.p. or 7-9h.p. roomy C.B. combination, with all accessories; may good make, condition and tyres good.—Write, or call after 6, 12, Heathway, Northumberland Heath, Erit. [4269]

SPOT Cash for Triumphs, Douglas, A.J.S., Enfields, Brough, Nortons, Hendersons, Sunbeams, Zenith, Harley-Davidson. Write, call, or 'Phone Holborn 5777.—Wauchope's, 9, Shoe Lane, London. [5415]

TWO Wire Wheels, 26x2½, with brake drums, running free on plain axle, no drive needed, short brake lever, steering wheel, column, rack, and pinion, off cycle car.—Heathle, Peasmarch, Sussex. [X4202]

ADVERTISER, who is about to open business in Liverpool, requires reliable firms to supply motor cycle and light car accessories, wholesale; in particular, lamps, tyres.—12, Southgate Rd., Liverpool. [X4146]

TWO Zeniths, 6h.p. or 8h.p. countershaft, not earlier than 1916; would exchange 5h.p. Zenith countershaft and Swan torpede sidcar.—Braodon, Furnishers, Berkhamsted, or 16, Braxted Park, Streatham. [X4113]

MODERN Combinations, motor cycles, and light cars; distance no object; cash waiting. 'Phone, write, or call.—Moore's Presto Motor Works, Ltd., Tamworth Rd., West Croydon, Surrey. Est 1881. Croydon 1545. [4223]

WANTED, immediately, good machine, either following makes, for summer tour: 2½h.p. Douglas, 3h.p. Enfield, 2½h.p. Lewis, 2½h.p. A.J.S., 3½h.p. twin James, or Baby Triumph.—King, Stepford, Cambs. [4234]

WE are wanting several solo machines and combinations. Send full particulars of anything you have for sale, and our representative will call with cash and bring away if suitable.—Bunting, Mason's Av., Harrow. [2769]

CHAIRMAN RHYMES.

*Just a kick!
Now then, quick!
How's the carburettor?
Loose the clutch,
Not too much—
Now she's pulling better.
Air like wine,
My! it's fine
Cycling from your troubles.
No alloy
To my joy
Which a CHAIRMAN doubles.
5½d. for 10 everywhere.
R. J. Lea, Ltd., Manchester.*

MOTOR and CYCLE HOUSES



of every description. Made in complete sections of best quality material only.

7ft. x 5ft. £8 10
9ft. x 6ft. £12 0
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Complete with floor, bolts, etc.

These houses can be supplied with double doors at 20/- extra. Write for list of other houses Estimates free. James Holloway & Co., 457-459 Brixton Road, LONDON S.W.9.

Telephone: Holborn 805.

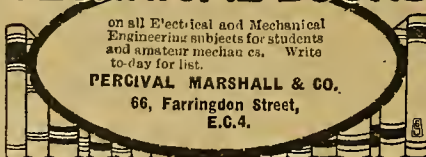
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on all Electrical and Mechanical Engineering subjects for students and amateur mechanics. Write to-day for list.

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The "Speed Nymph"—Mascot
For Motor Cycles and Sidecars, in Solid Bronze Silver Plated H.T. 5in. Supplied with its diameter clip for fixing to handlebar, or flat plate for bolting to top of sidecar.
Price £27 6. Postage and Packing 1/-.
Agents Wanted.
Sole Producers—The North London Carrying Co., Ltd., Small Yard, Fernhead Road, Farringdon.

WANTED.

DOUGLAS, Douglas, Douglas.—Best prices paid for second-hand machines and spare parts.—Vivian Hardie, Ltd., Douglas Experts, 24, Woodstock St., off Oxford St., Bond St., London, W.1. 'Phone: Mayfair 6559. [0985]

PERCY and Co. require at least 100 second-hand motor cycles and combinations. Please offer us your mount. We offer exceptional high prices. We pay you cash on sight. Percy and Co., 337, Euston Rd., London. [0925]

WANTED, Indians, B.S.A.'s, Sunbeams, Triumphs, Enfields, Harleys, A.J.S.'s, Matchless, Douglases, Zeniths; spot cash. Send particulars and price.—Wandsworth Motor Exchange, Ebor St., Wandsworth (Tow Station). [2524]

WANTED, tank of 1914 Triumph, or similar, about 27in. x 4½in. to 5in.; also spring forks suitable for 4h.p., up-to-date, stem between 5½in. and 7in. long, Triumph or Druid preferred.—Particulars to P.W.G.D., 2, Thorold Rd., Chatham, Kent. [4210]

WE are cash buyers of good second-hand motor cycles, not earlier than 1914 manufacture, highest prices offered, no risks in dealing with us.—Elce and Co., 16-16 Bishopsgate Av., Camomile St., E.C.3. [0551]

J. SMITH and Co., 16, Hampstead Rd., are open to purchase any number of first-class combinations and solo machines; price no object; we want the machines; no time wasted. Communicate with us at once; write or call. We pay spot cash on sight. [3894]

THE H.C. Motor Co. want motor cycles for spot cash. Highest prices given. Bring your machine to us, and compare our prices with the prices offered by other dealers.—The H.C. Motor Co., 347, Finchley Rd., N.W.5. 'Phone: Hampstead 4331. Open Saturday afternoons and Sundays. [5671]

SEND Your Motor Cycle to Palmer's Garage, Tooting, S. Wimbledon Station. Cash offer will be telegraphed immediately on receipt of machine. Machine can be included in fortnightly auction without charge if offer not accepted. Reserve price may be fixed.—Sole address, Palmer's Garage and Auction Rooms, 183-199, High St., Tooting. [0918]

EXCHANGE.

MAUDES.

MAUDES' arrange exchanges on any machines; best allowances for modern machines. See other columns for particulars.—Maudes', 100, Gt Portland St., London, W.1. [8215]

GENT'S Cycle, 3-speed, all B.S.A.; sell £16; exchange Douglas, cash adjustment.—143, North End, Croydon. [4064]

STAMPS, Will exchange cash for collections. State price, particulars.—Scale, 113, Sandywell St., Higher Openshaw, Manchester. [X4393]

6h.p. T.T. Rex, fast and powerful, good condition; sell £25, or exchange 3½h.p. or good lightweight.—Minkio, Thwaites Lane, Keighley. [X4385]

EXCHANGE good powerful tricar, with speeds, perfect order, good condition, for magneto motor cycle.—Box 4,177, c/o The Motor Cycle. [X4357]

1916 6h.p. Enfield Combination for a Harley-Davidson or 1916 7-9h.p. Powerplus Indian, or will sell.—C.B., 72, Hotham St., Stratford, E. [4203]

EXCHANGE Klaxon Electric Horn, with new accessories, for new mechanical horn, or sell £2.—337, Devon Buildings, Tooley St., London, S.E.1. [4373]

1914 Precision, 3½h.p., Bosch, B. and B., 3-speed Sturmey, for higher power with speeds; cash adjustment.—Box 4,153, c/o The Motor Cycle. [X4148]

2-SEATER, splendid condition, Bosch, 5 detachable wheels; exchange for combination, or sell.—Apply, Johnson, Bootmaker, 3, Church St., Lower Edmonton. [4432]

EXCHANGE 6h.p. magneto motor cycle, 2 speeds, free engine, perfect order, excellent condition, for good iron-frame pipoo.—Box 4,175, c/o The Motor Cycle. [X4355]

EXCHANGE Swift Delivery Van, 8h.p., well-built box body, perfect running order and condition, for 6h.p. combination, or sell £85.—Dunn, Sunningdale, Berks. [4570]

TOROGO 2-speed, free, kick start, countershaft gear, complete, Benolds and sprocket, nearly new; £12, or first-class Auto-Wheel.—Dobson, Stonefield, Garstang, Lancashire. [X4412]

LATE 1914 3-speed 4h.p. Triumph, one of the best, as new, and perfect, for Harley-Davidson, must be good machine; or sell £85, no other offers.—37, Cope St., Coventry. [X4477]

EXCHANGE, 3½h.p. N.S.U. coachbuilt Combination, 2-speed, for 2½h.p. 2-speed and clutch; or sell £35. Apply after 7 p.m.—2, Grove Mansions, Clapham Common, S.W. [4299]

SALE or exchange, 2h.p. Humber, splendid order and condition, accessories, £30; Decca gramophone, 20 records, £8; for good Douglas.—Beard, Westcliffe, Hucknall Rd., Nottingham. [X4321]

LARGE National Cash Register, 4 drawers, strikes up to £10, gives receipt, in perfect condition; exchange for good combination, or sell £100, or nearest.—Keene, Tobaccoist, The Barton, Bristol. [X4340]

EXCHANGE.

EXCHANGE 3-4hp. Motor Cycle, spring forks, drop frame, semi T.T. bars, enamelled French grey, lined red and white, completed, except mag. and foot-board; sell £21 or higher power; stamp, particulars.—James, Liden House, Cox Hill, Shepherdswell, near Dover. [4388]

THE H.C. Motor Co. specialise in exchange deals. We will allow you highest price for your old machine against any other new or second-hand machine in stock; machine bought for spot cash.—The H.C. Motor Co., 347, Finchley Rd., N.W.3. Phone: Hampstead 4631. Open Saturday afternoons and Sunday. [5667]

REPAIRERS.

WHITTALL Machinists Co., contractors to the War Office, for all motor repairs.—Below.

WHITTALL for Welding.—Experts in aluminium, broken parts reliably welded, accurately machined, promptly returned.—Below.

WHITTALL—Cylinders ground with guaranteed accuracy, pistons fitted; prompt, moderate. New pistons made to pattern or sketch.—Whittall Machinists Co., Whittall St., Birmingham. [0988]

ARMSTRONG or Sturmev-Archer gears or parts wanted.—Marks, 3, Shoe Lane, London. [7748]

SPEEDOMETERS and Parts, any condition; send or write.—97, Latchmere Rd., Battersea. [3127]

REPAIRS, overhauls, new parts; magnetos speciality; quick service.—228, Heather Rd., Birmingham. [X4206]

WELDING Broken Cylinders, flanges, combustion heads; immediate attention; reasonable prices.—Below.

WELDING Aluminium Crank Cases, gear boxes, by experts of 11 years' experience.—Below.

CYLINDER Grinding on latest machinery installed since hostilities ceased; accuracy guaranteed; new pistons fitted.—Sadgrove and Co., 140, Conybere St., Birmingham. [X0803]

CENTRAL Motors (Oldham), Ltd., undertake to thoroughly overhaul and repair any make of motor cycle.—Below.

BROKEN Frames, forks, crank cases, connecting rods, pistons, cylinders, etc., etc., welded by the process of oxy-acetylene. Send your enquiries. All work guaranteed.—Below.

WE Repair all makes of gear boxes, N.S.U. gears, etc. All repairs promptly attended to.—185A, Huddersfield Rd., Oldham. [X0390]

FOSTER, of 170, Cardigan Rd., Leeds, is again at your service, and can undertake any class of welding and machine work.

CYLINDER Grinding and Piston Making is with us a speciality. We shall be glad to have your enquiries.—Foster, Leeds.

PISTONS—We specialise in the manufacture of special aluminium alloy pistons, in hundreds of odd ones.—Foster, Leeds. [0310]

CYLINDER Grinding Unnecessary; compression restored; fit our rings; send piston and cylinder; half cost; certain cure.—Below.

PISTON Rings, high grade; low price; standard or oversize.—Patent Rings, 30, Wigan Rd., Atherton. [6575]

ARTHUR G. DAW, 114 Brixton Hill, for motor cycle repairs and overhauls; thorough workmanship, moderate charges. [4413]

FRAME, chassis, and tapk repairs, enamelling and plating, by experts; prompt deliveries.—Langham Co., Fitzroy St., Leicester.

DON'T Wait, we can undertake repairs, replacements, and overhauls at once, trade or private.—Central Garage, Hunstanton. [3038]

WE are prepared to undertake high-class machining for the trade; anything within the capacity of 8 1/2 in. lathes.—Box L1, 970, c/o The Motor Cycle. [3517]

SWIFT of Coventry, Ltd., undertake thorough repair and overhaul of any make of motor cycle at 132-134, Long Acre, London, W.C. Enquiries invited. [7931]

PAINTING, body building, conversions, hoods and screens to clients' requirements; quick deliveries; quotations with pleasure.—Palmer's Garage, Tooting. [4571]

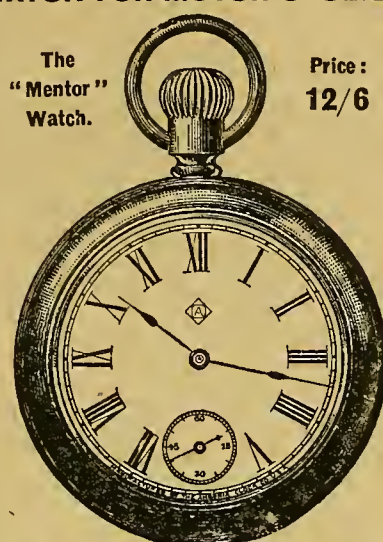
FRAME Repairs and Alterations.—Special frames and tanks built, any design; enamelling and plating.—A. Pilkington and Co., 390, Lichfield Rd., Birmingham. [2583]

WELDING—Broken cylinders, pistons, connecting rods; cylinders rebored, new pistons and rings.—A. Pilkington and Co., 390, Lichfield Rd., Birmingham. [2582]

TONGE Welding Co., Morton St., Middleton, Manchester.—Again at your service. Send that broken cylinder or crank case. Certain to please you. Quick return. [X2532]

STURMEY or Armstrong Gears and Premier free engine hubs; repairs executed or parts supplied promptly.—The Rotary Jointing Co., Regent St., Warrington. [9447]

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A REAL GOOD KNOCKABOUT
WATCH FOR MOTOR CYCLISTS

The
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Watch.

Price:
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GENUINE AMERICAN LEVER MOVEMENT,
MADE BY THE ANSONIA CLOCK CO.

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24c, King St., Hammersmith, W.6.

Telephone: Hammersmith 197. Established 1856.
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Armstrong and Sturmev Archer Hub Gears.

We regret to announce that owing to the pressure of work we are unable to repair the above gears with our usual promptness. We can only undertake repairs in strict rotation. Douglas G 1 box Parts stocked. Sturmev Archer Counters for Gear Parts stocked and repaired.

When sending wheels kindly remove all outside axle fittings and label clearly with owner's and our address.

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Please note we do not repair push-cycle gears.

METAL DISCS

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SHEET Metal Works, N. London, requires orders for motor cycle tanks, wheel discs, etc.; enamelling if required; repairs speciality.—Box 4070, c/o The Motor Cycle. [3183]

REPAIRS to Motor Cycles; magnetos promptly attended to. Large stock accessories and parts. Dunlop tyres stocked.—The Mart, 151, Caledonian Rd., King's Cross, London. [1588]

GENERAL Machine Parts for cars and cycles, pistons, piston rings, valves; accurate machine work a speciality.—White Bros., 13, Wiodmill St., Tottenham Court Rd., London, W.1. [4260]

WE specialise in Repairs, overhauls, and re-crating, enamelling and plating. Machines turned out like new.—Williams and Harding, Paradise St., Coventry. [X4478]

MOTOR Cycle Overhauls, welding a speciality; repairs to frames, etc., at moderate charges by efficient workmen, 15 years' reputation.—Pioneer Motor Works, 290, High St., Stratford, London, E.15. [4433]

HEPPELLTHWAITE for Overhauls, frame repairs, plating and enamelling, and rebushing and engine repairs, first-class workmanship, guaranteed and quick delivery.—17-19, Wilcox Rd., South Lambeth, London, S.W.8. [4391]

COVENTRY Motor Mart, Ltd., London Rd., Coventry.—Overhauls and repairs to any make of motor cycle or light car; obsolete parts made and fitted; plating and enamelling; skilled mechanics; prompt attention. [X0612]

REPAIRS and Overhauls to any make of car and motor cycle; any component made to order.—John Ireland and Co., Engineers, 71, Gowan Av., Fulham Palace Rd., Fulham, S.W.6. [4250]

ENGINE Repairs and Overhauls; 5 years' experience on aero engine work. We are now specialising in repair work to all makes of internal combustion engines. Tell us your requirements.—Nelson and Hardie, Engineers, Leam St., Leamington. [X4476]

CYLINDERS Rebored and Ground; new pistons, rings, valves, any pattern, made and fitted; engines rebushed and thoroughly overhauled, accurate first-class work guaranteed; prompt attention.—Central Motor Co.'s Engineering Works, Bromsgrove St., Birmingham. [3084]

TENNANT Engineering Co., Pershore St., Birmingham, regretfully announce that they cannot undertake any more work for delivery before August. By then they hope to have fully equipped their new factory, and, that done, they will again be in a position thoroughly and well to handle any and every description of motor repairs. [X2887]

ACETYLENE and Electric Weldings.—Broken flanges, cracked water jackets, scored bores, worn bearings, built up; aluminium gear boxes, crank cases, any broken motor part welded and machined up and returned in 7 days, 14 years' experience.—Lincoln Jeffries, Jun., Cuo and Motor Maker, 120, Steelhouse Lane, Birmingham. [6784]

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CASTINGS in All Metals Supplied.

WHY wait when you can get guaranteed delivery. All other class of motor fittings supplied. A large stock of coach bolts. Surplus stocks of steel and brass purchased.—C. Galpin, 36, Earl St., Coventry. Phone: Coventry 405. [X3568]

GEORGE SMITH'S Motor Cycle Depot, Clapham Junction, S.W.11.

RENOULD, Brampton, Coventry chains, 1/2x3-16, 1/2x4, 5/8x4, 3/4x7-16; Dunlop 1919 studded covers, heavy, 24x2 421, 26x2 43x9, 26x2 47/3, 26x2 41/9, 28x2 57/9, 28x3 70/3, extra heavy ditto, 26x2 63/3; inner tubes, 8/6, 8/9, 10/3, 11/3, 11/9, 13/3; Douglas T.T. bars, 18/6; Brooks saddles, 37/6; King Dick pat. spanners, 7/6; rubber grips, 4/3; racing helmets, tan leather, with ear roll, 15/6; electric horns, 42/-; Hellenas flash batteries, 14/6; Dunlop and Pedley belts, 3/4 in., 1 in., 1 1/4 in.; piston rings, all sizes, 60 to 80 mm., best make, 2/6 each; tubular box spanners, in sets, 2/9, 5/9, 7/9; bulb horns, 15/6, 18/6, 21/-, 25/-; accumulators, 4 volt 20 amps, 27/6, 40 amps 35/-; electric bulbs, all sizes, 2 to 12 volt, S.B.C., 2/6 each; rims, 26x2 1/2, plated, drilled 32 holes, 10/9.—Phone, write, or call 8.30 to 7. Wednesdays close 1. Saturdays 8 p.m. Country orders despatched per return.

GEORGE SMITH'S Garage, Mossbury Rd., Clapham Junction, execute all kinds of motor cycle repairs, overhauls, tuning, enamelling, nickel plating, by skilled and trained mechanics. Country orders with quick despatch; send your enquiries.

GEORGE SMITH'S Motor Cycle Depot and Garage.

—Address all communications: 268, Lavender Hill, CLAPHAM Junction, S.W.11 (1 min. Station). [4008]

DYNAMO, lighting cycle or car; £3/17/6.—Lucas, 84, Upper Ground St., S.E.1. [4417]

N.S.U. Gear, 25; Phillips pulley, fit Triumph, £2.—31, Cowper Av., Sutton. [4747]

100 Motor Cycle Crates; 10/6 each.—Wachoupe's, 9, Shoe Lane, London, E.C. [3274]

MAC Carburettor, off twin, 1 1/4 union, 16/-.—Clark, Barnes Rd., Portlisle, Sussex. [X4259]

MISCELLANEOUS.

XL'ALL Large Pan Saddles, pre-war goods, 11in. stem; £2/10 each.

HANDLE-BARS, 11in. stem; 12/6 each.

INDIAN 2-speed Gear Box, includes clutch and 2 sprockets; £10/10.

STEPNEY Wheel, fitted with 700x85 Dunlop grooved tyre, new; £8/15.

FOUR Large Car Generators, square type, suitable for bolting on footboards; £2 each.

STRONG Motor Cycle Crates, Triumphs and other best makes; 10/6 each.—Wauchope's, 9, Shoe Lane, Fleet St., London. [4698]

BANCROFTIAN Co., the most reliable and cheapest house in the United Kingdom.

TYRES.—Don't buy any until you have seen our special list of high-grade clearance tyres at less than half manufacturer's prices. Write for list at once. We have the largest stock of tyres in London.

BELTING.—All best makes in stock at lowest prices. Few short lengths.

WATERPROOF Overalls.—Highest class at practically pre-war prices. Don't buy any until you have seen our list.

MAGNETOS.—In stock, Bosch, Dixie, U.H., etc. Repairs at lowest prices.

CHAINS.—The largest stock in England; Perry, Coventry, and Renolds. All sizes at lowest prices.

SPEEDOMETERS (a great speciality of ours).—Largest stock in London. Stewart, Cowey, Watford, Jones, Smith. Repairs and replacements at lowest prices.

CARBURETTORS and Replacements.—Brown and Barlow, Amac, and Sensprays at lowest prices.

PISTON Rings and Valves.—Pretty well all makes at exceptional prices. Send patterns.

HORNS (new).—Motor cycle, 12/6, latest pattern; mechanical, 21/-, 32/6, and 36/-.

LAMPS and Generators are a great speciality of ours. Lucas, P. and H., Miller's, F.R.S., and others in stock at lowest manufacturers' prices.

WIND Screens and Aprons in stock, Cameo a speciality. Hoods at low prices.

MOTOR Cycles and Sidecars. Orders taken for all makes; early deliveries. We stock everything for the motorist. Send your enquiries.

BANCROFTIAN Co., 64 and 78 (extension of premises), Bishopsgate, London, E.C. T.A.: Chaikel, London. Tel.: 9897 London Wall. [2989]

B and B. Lightweight Carburettor, minus one cable: 25/-—386, Hee St., Walthamstow. [4328]

SPEEDOMETER, Watford, 26in., 50/-; Bosch, 60°, 50/-—12, Thesiger Rd., Penge, S.E. [4349]

BINKS Carburettors.—We specialise in these for any machine.—Booth's Motories, Halifax.

BINKS Carburettors.—Good allowance for your carburettor in exchange.—Booth's Motories, Halifax.

BINKS Carburettors.—Run on paraffin or substitute and economise.—Booth's Motories, Halifax.

BINKS Carburettors.—Supplied promptly; old carburettor taken in exchange.—Booth's Motories, Halifax. [X5125]

8h.p. Clyne Frame, tank, spring forks, good condition; 23.—P.G.U., 29, Nelson Rd., Chelmsford. [4602]

BRAMPTON Gear, 45/-; wanted, Rudge semi T.T. bars.—Turner, 27, Matlack Lane, Ealing. [4457]

DOUGLAS Cylinders, also few parts for sale.—A. W. 47, Brondesbury Villas, London, N.W. [4498]

ENLARGEMENTS, life size, 2/6, copied from any photo.—Trump, Photographer, Lyne Regis. [X4260]

ONE 3-speed Gear Box, aluminium, new condition; 22/15.—39, Caithness Rd., Mitcham, Surrey. [4341]

INDIAN Electric Head Lamp and Horn, good condition; 30/-.—Gillanders, Gavin St., Motherwell. [4309]

ARMSTRONG Typewriter, very little used, equal to new; 10 gns.—Ginger, Motors, Banbury. [X4361]

AQUA-VINCO lightweight waterproof overalls, as new; 60/-.—Box 4,157, c/o The Motor Cycle. [X4043]

THREE Motor Cycling Suits and Waders, suit all weather; 60/-.—Burn, 26, Market Place, Devizes. [4623]

3-SPEED Armstrong Hub, belt rim requires spokes, new controls; 24.—Box 4,173, c/o The Motor Cycle. [X4377]

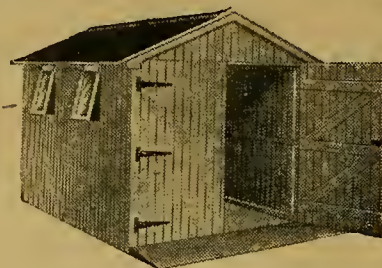
FOR Sale, Yost typewriter, nearly new, or part exchange for motor cycle.—Statham, 57, Burton Rd., Derby. [X4309]

3h.p. Rex Engine, 23; 2½h.p., 23; N.S.U. gear, 32 fit Rex, less controls; 23.—53, Stanway Rd., Coventry. [X4295]

MINERVA.—Large stock of spares; no cylinders.—Cookson Bros. and Harrison, Wright St., Old Trafford. [X9787]

SPEEDOMETER, Isochronous, as new, guaranteed perfect, with drive; 58/- cash.—105, Wright St., Coventry. [X4097]

SUTCLIFFE'S MOTOR CYCLE and MOTOR CAR SHED



Length.	Width.	Height to ridge.	Price.	Floor extra.
6ft.	5ft.	6ft.	£9 0 0	£2 9 0
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10ft.	7ft.	8ft.	£17 0 0	£5 10 0
11ft.	8ft.	9ft.	£21 10 0	£7 0 0
15ft.	12ft.	10ft.	£36 0 0	£14 0 0
20ft.	12ft.	10ft.	£46 0 0	£16 0 0

All sent carriage paid in sections.

Sutcliffe's Motor Sheds are the strongest built, best designed Motor Sheds you can get at anything like the price; don't be tempted to buy weakly constructed Sheds. They are most expensive in the end. Study Sutcliffe's Construction—Sides, ends, roofs built on 1-inch best match boards, roof also covered with extra heavy felt, ramp roof, framework of tremendous strength. All floors are double strength will carry a ton or more weight easily. All houses erected and bored before delivery, all bolts supplied free. If any client is not perfectly satisfied, simply return shed and we refund purchase price. Full details in free booklet. (Can run any size in 2 to 5 days. F. & H. SUTCLIFFE, 44, Wood Top, Hebden Bridge, Yorks. 'Phone 1—58, Hebden Bridge.

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Prices from £6 10s.

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Works: Kingston Rd., Staines. Est. 10 years.



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Motor and

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TENANTS'

FIXTURES

Exceptional Low

Offer.

CARRIAGE PAD.			Strong	
Long	Wide	High	Price	Floor extra.
8ft.	6ft.	7½ft.	£11 11 0	£14 14 0
9.	7.	7½.	12 15 0	2 5 0
10.	8.	8.	15 5 6	3 1 0
12.	8.	8.	16 18 0	3 10 0
14.	8.	8½.	19 0 0	4 5 0

These houses are made in sections and bolted together, easily erected on arrival, constructed of well-seasoned imported timber and grooved matchboard; roof covered in addition with best quality felt, window to open, doors with bolts, lock and key complete. Any other size quoted on application.

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cap or spare S.P. hole. Valve

caps screwed, 1/6 each.

3.95, High SI, CRAWLEY

SUSSEX.

All Agents can supply it.

MISCELLANEOUS.

GRADO Multi Pulley, ball thrust, recessed fittings complete, now; £5.—Hobbs, 53, Liverpool Rd., Luton. [X4096]

1911 Douglas, dismantled—Send stamp for detailed list of parts available, 251, Bentley Rd., Doncaster. [X4319]

TRIUMPH Pattern Pistons, gudgeon and rings, 35/9; gudgeon only, 4/-; rings, 2/6; bushes, large 4/-, small 3/-; valves, inlet and exhaust, 19/10, 67/6; valve springs, both sizes, 7d. each; filler caps, 2/6; spokes and nipples, 2d.; extra covers, 35/-; tubes, 2/6; also large assortment of second-hand Triumph spares.—Robinson's, below.

PREMIER Pistons, 3½h.p., gudgeon and rings, new, in stock; 35/-, plus postage.—Robinson's (below).

SIDECAR Mudguards, enamelled, with stays, strong, 12/6, postage 1/-; College mudshields, 16/6 each, 32/6, 36/6, plus postage.—Robinson's (below).

RENOLDS Chains, A.J.S., Sunbeam, 91-101 links, 18x2, 24/7; ditto, 56 links, 12/8; B.S.A., 88 links, 24/4, 20/7; 54 links ditto, 12/9; Renolds stud extractors, 5/6.—Robinson's (below).

OVERALL Summer Suits, complete, dustwear, 27/6; lined gamut gloves, 25/6, 24/6, 17/6; postage extra.—Robinson's (below).

TYRES for Douglas and Triumph, studded extra heavy covers, sizes 26x2¼ 30/-, 2½ 34/-, 2½ 36/-; inner tubes, 9/6; guaranteed. Try one sample.—Robinson's (below).

PISTON Rings, high tensile cast iron, Douglas, Triumph, Sunbeam, Rover, A.J.S., Indian, J.A.P., Premier, Humber, Endfield, B.S.A., P. and M., 2/6 each; correct sizes in stock; no waiting.—Robinson's (below).

DOUGLAS Handbooks, either 4h.p. or 2½h.p., descriptive illustrations your own repairs, 1/3 each.—Robinson's (below).

DOUGLAS Gear Boxes overhauled and repaired; all spares in stock, including secondary shafts.—Robinson's (below).

4h.p. Douglas Spares.—Cylinders, 45/-; pistons complete, 26/-; gudgeon pins, 2/6; rings, 2/6; connecting rods, 27/6; small end bushes, 5/6; crank-balls, 61/-; flywheels, 44/-; flywheel sprockets, 5/8; valves, 2/6; springs, 8d.; collars, 9d.; cotters, 2d.; valve caps, 6/6; asbestos washers (exhaust), 7d.; valve cap, 4d.; Renolds chains, 17/3; links, 1/-; brake pad complete, 5/-; pads only, 2/6; head clips, 11/6; extra heavy covers for 4h.p. Douglas, 36/-; postage extra.—Robinson's (below).

ODD Bushes, any size, any make, by return; send old samples when ordering.—Robinson's (below).

HANDLE-BARS, semi-T.T. Douglas pattern, 7½in. tops, 11in. stem, also touring pattern, 17/6; postage extra.—Robinson's, below.

DOUGLAS Accessories, reliable quality, latest B175 Brooks saddles, 45/-; B170, 35/-; springs, 2/6; handle grips, 2/6; knee grips, 14/6; rubber grips, 4/3; Dunlop heavy covers, 47/3; inner tubes, 10/3; belts, 11/5; belt fasteners, 1/6; belt punches, 2d.; Dunlop outfits, 3/- and 4/6; solution, 9d.; Lodge plugs, 5/-; weatherproof, 7/6; Sphinx plugs, 4/-; Blumel's tyre pump, 7/-; pump connection, 1/3; good horn, 21/-; three tyre levers, 1/6; valve lifter, 2/-; grease injectors, 3/-; Lucas wrenches, 7in., 9/6; King Dick wrenches, 5/6; Radiograph, 1/6 and 6d.; oil cans, 2/9; goggles, 3/-; Price's gear lubricant, 1/6; funnels, 1/9 and 2/9.—Robinson's (below).

DOUGLAS Spares, brand new.—Footboards, 24/-; pair; footrests, 15/-; pair; upturned and semi-T.T. bars, 7½in. and 15-16in. in stem, 17/6; head clip, 7/6; flywheels, 27/6; flywheel sprockets, 4/6; mudguards, touring rear 18/6, front 12/6, T.T. type rear 12/6, front 10/-; number plates, 3/-; T.T. type rear stand 14/6, front 7/6; valves, 2½h.p., 4/-; valve guides, 4/6; springs, 6d.; collars, 9d.; cotters, 2d.; piston rings, 1/9; gudgeon, 2/-; locking plates, old pattern 2/-, new pattern 3/-; ball bearings, gear box, 12/6; ball bearings for crankshaft, 25/6 and 15/6; lubricating glasses, 1/9; front stand clip, 1/6; rear, 2/-; 2 and 3-speed gears; Kick start bolts, 6/6; springs, round, 9d.; flat, 1/-; clutch cones with flanges, 18/6; 1914-15 clutch spares; hub axles, 1913 5/6, 1914 5/6; cups, 3/9; 1912-16 cylinders, 30/-; joints, 2d.; lock ring, 2/6; tappets, 4/6; spanners, 6d.; bushes, 3/9 and 5/6; compression, petrol, and drain tips, 4/6; armoured toolbars, 12/6; tool roll, 5/6; with tools, 30/-; front brakes, 27/6; front shoes with pads, 5/6 pair; pads only, 1/- pair; rear, 2/-; foot brake springs, 1/-; spokes and nipples, 2d.; Douglas front wheel, 40/-; rear wheel, with belt drum, 55/-; belt drum only, 15/6; rims, 8/6; throttle or exhaust wire, 1/6; outer sheaths, 3/-; Douglas 2½h.p. pistons complete, 17/6; copper ends, 2d.; grease injectors, 3/-; valve lifters, 2/-; Docco, 4/6; pulleys, fixed 11/6, adjustable, 17/6; Douglas pattern forks, complete, £3/15; fork springs, 3/6; links, 1/6; spindles, 1/6; tank caps, 2/6; glasses only, 6d.; magnet spanners, 9d.; exhaust ditto, 2/-; Renolds chains, 9/6; spare links, 6d.; stud extractors, 5/6; Amac carburettors, 70/-; Amac throttle valves, 9/-; pair; floats, 2/-; needles, 1913 5/6, 1914 5/6; long exhaust pipes, 15/-; pair; gauges and caps, 3/-; magnet, C.A.V. £8/5, Thomson-Bennett £27/7/6. Packing and postage extra.—Robinson's Garage, Green St., Cambridge. Tel.: 388. T.A.: [4725]

MISCELLANEOUS.

10-12h.p. 4-cyl. Star, chain drive, ZU 4 mag., tyres very good in good order, make fine van; £75.—Below.

TWIN Water-cooled Engine, good order, less mag. and carburettor, also chassis, gear box, wheels, steering, radiators, etc., to suit same, make fine runabout; £50.—S. P. Webb, High St., Fordingbridge, Hants. [X4239]

TRICAR Chassis, speed gear, wheels, £3; magneto chain wheels, 2/6.—Gosling, 136, Cauldwell Hall Rd., Ipswich. [X4364]

BINKS Carburettor, complete with extra jets, new suit 3 1/2 h.p.; 55/—Shaw, 190, Padgate Lane, Warrington. [4673]

AMERICAN Excelsior Spare Parts, head lamp and generator, U.H. mag., 26x2 1/4 tyre.—Beardshaw Wood Green. [4179]

50 NUTS, Screws, Washers (assorted), 2/6, 1/7 free; send for list.—Eric Meadows, Buckfield Lane, Southport. [3928]

NEW Eofield Chain, Renolds, 32/6, offer; pillion seat, wants cushion, 7/6.—Bran, 20, Farlington Rd., Earlsfield, S.W. [4243]

72 SPRING Washers, 3-16 to 1/2, 1/6; 36 castle nuts, 1/2 to 1/2, 1/6; carriage paid.—Wood, 58, Tithebarrow St., Preston. [X4156]

WICKER Sidecar Body, 10/-; A.K. knee grips, 6/-; generator, 5/-; coil, 15/-.—Wilde, Willesborough, Ashford, Kent. [4075]

SIMPLEX Detachable Boat Motor, 3 1/2 h.p., as new, easily fitted to any boat; £25.—Write, Warren, Lyndhurst, Broadstairs. [4218]

SPEEDOMETER complete, 3ft. flexible horn, and electric speedometer; £7/10.—89, Abbey Rd., St. John's Wood, N.W.8. [4195]

TAIL Lamp 10/-, side lamps 42/-, pair brand new; goods approval against repurchase; post free.—Palmer's Garage, Tooting. [6831]

FRAME with Druid forks, tank, mudguards, carrier, stand, equal to new, for 2 1/2 h.p. engine; £15.—Ginger, Motors Banbury. [X4362]

STEWART Speedometer, trip model, for sale, for 26in. wheel, practically new; £3/5.—Harrison, "Strath-eira," Rugby Rd., Leamington. [X4354]

FOR Sale, high and low gear chains, with sprockets, 5x5-16in., for P. and M.; 15/-.—Curzon, 8, Sandhurst Av., Herehills, Leeds. [X4109]

TRIUMPH Spare Parts and Replacements; most parts by return of post.—Forded Motors, 11 and 13, Forfield Place, Leamington Spa. [X4480]

QUADRANT Motor Cycle Frame, forks, guards, and wheels, with belt rim and free-wheel; £2.—F. Mumford, 37, Westside St., Spalding, Lincs. [4330]

B. and B. Carburettor, complete with controls, 15/-; also Amac, new condition, 3 jets, 22, 25, and 30, 35/-.—Glossop, Lee Green, Cliffe-at-Hoo, Kent. [X4470]

TWO 1917 4h.p. Triumph Engines, Sturmev-Archer 3-speed gear box, all complete, in perfect condition; what offers.—22, High St., Maidstone. [4582]

TRY the Aslatt tyre stopping, the £ s. d. saver in tyre hills; 1/1 1/2 per tube, post free.—The Aslatt Co., Midanbury Lane, Bitterne Park, Southampton. [X2516]

HAVE YOU Written to Young's for your requirements? If they are obtainable you'll find them there.—Young's, The Parade, Kilburn, N.W.6. [0568]

MAPS, Eighteen Ordnance Survey Maps, London and Southern Counties, all linen, mostly unused; 15/-.—Box 12, 144, c/o The Motor Cycle. [4143]

DISCS, aluminium, seamless, 26x2 1/4 wheels only, set four 3 gns.; packing, carriage extra; lightest, smartest.—Railway Garage, Staines 'Phone 139, [4006]

PULLEYS for any motor. Adjustable 14/6, plated fixed from 7/6; guaranteed, post free.—J. Perkins, 455, High Rd. Leyton. 'Phone: 248 Walthamstow [4762]

ENFIELD 2-speed Gear, suit 6h.p., returned as new from makers, £9.—Enfield sidecar mudguard, new, 17/6.—Vickers, Newsagent, Meadowfield, Darham. [X4201]

REX frame, tank, wheels, tyres, tubes, £8; twin mag., Bosch, £4; carburettor with controls, £2.—Jas. Orr, Station House, Leadhills, Lanarkshire. [X4147]

CHASSIS, off 7-9h.p. rigid frame Indian, complete with disc wheel, tyre, and all springs and connections, as new; £15.—83, Church Lane, Charlton, S.E.7. [4300]

150 SCREWS, nuts, washers, set screws, and studs, 2/6; 144 bright screws, 2/-; 72 bright hexagon nuts, 2/-; carriage paid.—Wood, Tithbarrow St., Preston. [X4155]

STANDARD Speedometer, only done 600 miles on an Indian, just overhauled, with rear wheel drive; £5, or best.—Walker, The Hut, West End Lane, Pinner. [X4166]

BINKS, 3-jet, complete with controls and spare jets, for 1912 Douglas, not unpacked, owner sold machine before delivery; £4.—18, Cemetery Rd., Scunthorpe. [X4095]

HEAD Lamp, generator, combination bracket, 25/-; speedometer, nearly new, 40/-; accessories, 10/-; 4 volt 20 amps., 17/6.—228, Heather Rd., Birmingham. [X4205]

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Kimberley Rd., Willesden Lane,
KILBURN, N.W.6.

NEW MACHINES LATER;
FOR THE PRESENT—
Repairs, Overhauls, Spare Parts.

Machines or parts sent for repair should bear a second label, with name and address of sender.

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Rudge Multi" Combinations. Early delivery at list price. Second hand Machines always in Stock. Areo" Sidecar bodies. Three models, £7 10s. each. (Carriage and packing to/-) "Cameo" Windcreens £2 each. All motor accessories supplied at lowest prices.

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High-class Combinations, Motor Cycles, Light Cars, and Landaullets.

When writing, quote full details, year, and lowest price.

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Moore's Presto Motor Works, Ltd.,

Tamworth Road, West Croydon, Surrey.
Established 1881. 'Phone: Croydon 1545

MISCELLANEOUS.

CASTINGS.—Brass, gun-metal, phosphor bronze, and aluminium to customers' patterns; quick delivery.—Cattermole and Maybury, 65, Montague Rd., Smethwick. [X0189]

PAIR 26x2 1/4in. Clincher de Luxe Covers, new, 45/-; 2h.p. Humber engine, 70/-; Lucas King's Own head light, 15/-.—2, Belmont Terrace, Belle Vue, Carlisle. [X3858]

BE Up-to-date. Cast aluminium number plates for motor cycle fitment; 15/- per pair, post free, 4 days; special terms to trade.—Young, 27, Western Elms, Reading. [4615]

BAT Coachbuilt Sidecar, quick-fit, 25/10; large Gloria head light, 15/-; generator 10/-; Douglas chain, 4h.p. (new), 10/-; White bells, 5/6, 7/6, 7/6, Cowdrey Rd., Wimbeldon. [4313]

BROWN Army Canvas Shoes, leather soles, 2/-, 2/6; Canadian white canvas shoes, leather soles, 3/6, 4/6; army boots, 9/-; catalogue free.—Gould, 47, Abber Place, Plymouth. [1995]

TARPAULINS for sale, repaired and redressed, S.H. railway truck sheets, London works; also few new waterproof sheets.—For particulars write Johnston, 12, Broughton Rd., Croydon. [3098]

1915 4h.p. Triumph engines, £18 each; counter-shaft Sturmev-Archer 3-speed gears, equal new, £18 each.—Speechley, 1, Gunnersbury Lane, Acton Hill, London, W.3. [4499]

TWO pair new Triumph Forks; one pair nearly complete; what offers? 3h.p. Fairair engine, R.N. box sidecar body.—Particulars, Platts, 602, King's Rd., Fallow, London, S.W.6. [4490]

28x3 New Tyre, suitable back wheel, £2/10; Bosch magneto off Indian, £2/10; pillion seat with back rest, 25/-; wanted, 700x80 tyres.—153, Archway Rd., Highgate, N. [4071]

MISCELLANEOUS.

SENSPRAY off Rudge, 15/-; 1913 Indian touring bars, 10/-; 1915 Harley touring bars, 15/-; T.T. bars, 7/6a. stem, 3/6; pair Hobson plugs, 4/-.—85, Dalberg Rd., Brixton, S.W.2. [4468]

JONES Trip Speedometer for 26in. wheel, complete perfect condition, run 700 miles, £3/10; 8ft. 1 1/2in. Whittle belt, little used, 30/-; wanted, lin. Dunlop.—124, Melbourne Rd., Leicester. [X4382]

TRIUMPH Spares.—Engines (1915), 4h.p., Sturmev Archer countershaft, 5-speed gear boxes, frames tanks, forks, wheels, etc.—Speechley, 1, Gunnersbury Lane, Acton Hill, London, W.3. [4609]

FLINTS for Lighters, 1/3 dozen, 10/6 gross; wheels 4d., standards 5d., wickholders 8d., screws, springs, wicks, 1d. each; best reliable, post free.—II Dunster, 3, Mylne St., London, E.C.1 [4249]

LUCAS King of the Road Acetylene Gas Lamp and generator, brackets, etc., as new, 70/-, or offer; 26x2 1/4 Dunlop rubber-studded tyre, new, 55/-.—Smith, Lochnagar, Hillcrest Rd., Purley, S.E. [4216]

COMPLETE 3 1/2 h.p. J.A.P. Crack Case, magneto platform, and chain cover, unused, £5; also pair Triumph knee shields, practically new, 55/-.—V. Marriott, 18, Key Hill, Birmingham. [X4462]

R.O.C. Wicker Chair Sidecar, 5-6h.p. Peugeot engine a.o.l.v. 2-speed, clutch, Bosch mag., lamps; best offer over £23; subject to approval; Bristol district.—Box 4,169, c/o The Motor Cycle. [X4280]

100,000 Shop-soiled and Second-hand Files 6in. 16in., genuine salvage stock, all guaranteed usable. Send £2/6 for 3 dozen assorted, carriage paid. approval.—Palmer's Garage, Tooting, S.W. [1629]

UNBREAKABLE Chrome Nickel Valves, guaranteed one year, any pattern, 6/- each, 10/- pair; step-cut piston rings, 4/- pair, post free per return.—Capacity Tool Co., Broseley, Shropshire. [2291]

B.S.A. Forks, heavy pattern, new, £3/5; mechanical horn, equal to new, suit car or cycle, 25/-; Longue-mare carburettor, suit stationary engine or car, 15/-; Nicklin, 47, Bricklin St., Portobello, Staffs. [4294]

DISCS for motor wheels are our speciality. We make them for the rider who values the clean built sporting appearance they give to a machine, and is fed up with barking his knuckles cleaning a myriad spokes.

DISCS of Enamelled Sheet Metal supplied ready to fit any make of machine, with all necessary fittings, 55/- per set for two wheels, extra 17/6 for combination. We can supply for Triumph, Douglas, Indian, etc., from stock, and for any other machine in 3 days.

DISCS of Polished Aluminium. One word explains the appearance they give to a machine—dinky, 60/- per set, for any machine, carriage paid.—The Auto Sheet Metal Co., 2a, Maygrove Rd., Brondesbury, N.W.6 (opposite Kilburn Met. Station). [4656]

SIDECAR Covers.—Any shape made specially to your pattern. Send old one, and we quote price per return post and deliver within 3 days.—Waterproof Co., Portland Buildings, Ratland St., Nottingham. [4146]

PISTON Rings, Triumph, Rudge, Precision, Villiers, J.A.P., Sunbeam, James, 2/5 each; Enfield, Douglas, Lewis, 2/- each; in stock.—Lifford Accessories Co., 10a, Gaildhal Buildings, Navigation St., Birmingham. [X3623]

MOTOR Cycle Waterproof Covers, shaped to completely cover cycle, lined pure rubber, only a few left; worth 50/-; in price 30/- each; cash with order.—Morris, 18, Fairholme Rd., West Kensington, London [4138]

2-Speed F.E. gear box for light car, as new, £7/10; 26x2 1/4 front wheel, complete tyre, 17/6; Lucas King's Own lamp set, 35/-; heavyweight B. and B. 32/6; other items.—Chalkley, The Broadway, New Southgate. [4472]

NEW Jardine gear box, with 4-speed free engine clutch, complete with back frame parts and bracket ready to attach to machine, £25; would accept Albion 2-speed gear in part exchange.—Carter's, Hstock, Leicester. [X4153]

WHEELS, Wheels, Wheels.—Cycle and motor cycle wheels built to order, back wheels from 45/-, front wheels from 25/-; cycle and motor cycle frame repairs; stamp, enquiries.—Pendleton, 28, Lonsdale Sq., Liverpool Rd., London, N.1. [4285]

3h.p. Ariel Engine, £4; B. and B. carburettor, £1; Thomson and Bennett magneto, £3; frame, complete with tank, front forks, handle-bars, etc., 50/-; front and back wheel, 26x2 1/4in., 10/-.—Apply, Rackham, Givern, Abervenny [4079]

INDIAN Parts.—Cylinders, front and rear, £1/10 each; flywheels and crank cases; 2-speed main shaft axles, 10/- each; drivers, 10/- each; ball containers, 2/6 each; 2-speed gear box, £4; floats, 2/- each.—Bolton, Holden-hurst Rd., Bournemouth. [4457]

DECARBONISE your motor cycle without undoing a nut. Oxygene Compound does this by decomposing the carbon; 2/8 post free; sufficient for 12 months' running.—Clarotte Co., Sole English Agents, 245, Ecclesall Rd., Sheffield. [4172]

GARAGES.—We can supply timber for building, cut to any lengths. Price list on receipt of stamped addressed envelope. We are also importers of plywood suitable for coachbuilding.—The City Road Timber Yard, 227, City Rd., London, E.C.1. [1965]

MISCELLANEOUS.

GRADO gear complete, 70/-; Douglas gear, 80/-; N.S.U. gear, 90/-; Triumph valve, 5/6; C.A.V. mag., brand new, 85/-; trembler coil, 10/6; B.B. carburettor with controls, 21/-; La Grande saddle, as new, 25/-;—Box L2,232, c/o *The Motor Cycle*. [4737]

SPEEDOMETER, Jones, 26in., total mileage and trip gauge, both registering tenths; P. and H. head lamp and motor cycle horn; all three complete, in splendid condition, and perfect working order; £6, no offers.—Box L2,224, c/o *The Motor Cycle*. [4727]

TRANSFER Lines for motors, gold or colour, from 40ft. for 1/-; lines for cycles, complete set, panned, gold or colour, 1/3; send stamp for list, samples, and instructions.—Transfer Specialist, 13, Riversdale, Gleadlands Rd., Ashton-on-Mersey. [X2253]

HANDLEBAR Muhs.—Keep your hands warm. The finest value obtainable, waterproof and warmly lined, 7/6 pair; approval against cash.—Manufacturers, The Para Rubber Co., 27, 29, John Bright St., and 99, Station St., Birmingham. [X9335]

CROWN Adjustable Pulleys, 5in. 12/-, plated 14/-, postage 9d.; Triumph, B.S.A., Precision, Bradbury, Humber, Premier from stock, other models to order; Douglas pistons complete, 28/6; rings, 1/4; gudgeons, 2/-;—Ridgdon's, 204, Southampton St., Cambridge. [3568]

DISCS, Discs, Disca.—Best enamelled steel, light, strong, for 26in. motor cycle wheels, complete sets 33/-, for 2 wheels; sidecar wheel only, 16/6; carriage paid. All kinds of template work undertaken; terms for quantities.—Acme Cycle Co., 4, Copinger St., Greenheys, Manchester. [4335]

5,000,000 New Bright Steel Engineer's Hexagon Bolts, nuts, studs, metal screws available. Send 10/- for parcel of 250 assorted, useful sizes. Whiteorth metric, B.S.F., B.A. threads, guaranteed perfect goods, sent carriage paid. Write for full catalogue.—Palmer's Garage, Tooting. [9188]

B.S.A. Spring Forks complete (links slightly bent). £1; new sidecar front tube connection with 4-bolt clip, £1; horn and 4ft. extension, £1; 5 lamps and generator brackets (cost 32/-), tooling, etc., £1; summer crash suit, £1; lady's hood and sundries, 10/-;—Broomfield Rd., Surbiton Hill. [X4094]

JOHN Bull T.T. bottled tube, 26x2½, unused, 15/-; Greenwood lamp bracket, 2/6; sidecar mat, 3/-; XL/All saddle spring, 1/-; Renold chain punch, 2/-; Scott spares—back sprocket, 5/-; right and left back stays, 3/-; chain repair parts.—Turner sidecar spring, 5/-;—Goodey, Chase, Heston. [X4221]

BRITINOL—British-made Tinol, past solder with flux combined. Place in position while cold, apply heat, and a perfect soldered joint is the result. No mess, no trouble, no tools required. Tins 3/3, post free. Free booklet on soldering with each tin.—Brit Metals, Ltd., 57, Lant St., Southwark, London, S.E. [3299]

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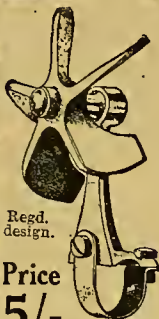
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